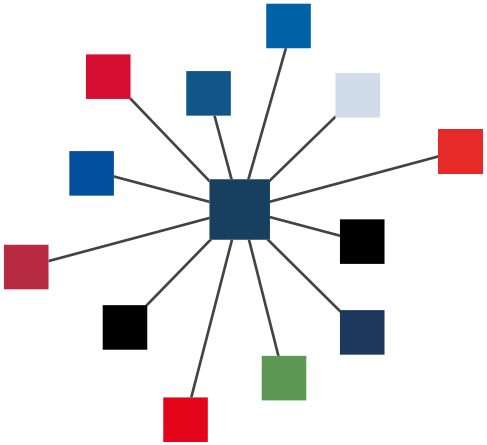
28. CHIRURGISCHE FORSCHUNGSTAGE BONN

25.-27.09.2025

ukb universitäts klinikumbonn

AGENDA

AGENDA



ukb universitäts klinikum**bonn**

GRUßWORT

GRUßWORT

Liebe Kolleginnen und Kollegen,

die Chirurgie steht mitten in einer faszinierenden Entwicklung. Digitale Simulation, Künstliche Intelligenz und robotische Systeme haben in den vergangenen Jahren völlig neue Räume für die chirurgische Forschung im Dry Lab eröffnet. Gleichzeitig bleibt die traditionelle Laborforschung im Wet Lab weiterhin ein unverzichtbares Fundament. Entscheidend für die Zukunftsfähigkeit und Wettbewerbsstärke unseres Forschungsstandorts wird sein, beide Bereiche innovativ weiterzuentwickeln und gemeinsam die Chirurgie von morgen zu gestalten.

Mit den „Chirurgischen Forschungstagen 2025“ im Bonn Surgical Technology Center (BOSTER) möchten wir diesen Prozess sichtbar machen. BOSTER steht dabei für den Brückenschlag zwischen klinischer Praxis, technologischer Innovation und wissenschaftlicher Neugier – und bietet damit den idealen Rahmen, um Chancen, Grenzen und Synergien gemeinsam zu diskutieren.

Wir laden Sie ein, Ihre Erfahrungen einzubringen, Impulse zu geben und die Zukunft der chirurgischen Forschung aktiv mitzugestalten. Mit herzlichem Dank an alle Mitwirkenden wünschen wir Ihnen spannende und inspirierende CFT 2025 im BOSTER in Bonn.

Mit freundlichen Grüßen,

Prof. Dr. Jörg C. Kalff	Prof. Dr. Sven Wehner	Prof. Dr. Hanno Matthaei
Klinikdirektor, wiss. Leitung	Leiter Immunpathophysiologie	Oberarzt

ukb universitäts klinikum bonn

BOSTER
BONN SURGICAL TECHNOLOGY CENTER

28. CHIRURGISCHE FORSCHUNGSTAGE BONN

BETEILIGTE FACHGESELLSCHAFTEN

Deutsche Gesellschaft für Allgemein- und Viszeralchirurgie e.V. (DGAV)

Deutsche Gesellschaft für Gefäßchirurgie und Gefäßmedizin (DGG)

Deutsche Gesellschaft für Kinder- und Jugendchirurgie e.V. (DGKJCH)

Deutsche Gesellschaft für Mund-, Kiefer- und Gesichtschirurgie (DGMKG)

Deutsche Gesellschaft für Neurochirurgie (DGNC)

Deutsche Gesellschaft für Orthopädie und Orthopädische Chirurgie (DGOOC)

Deutsche Gesellschaft für Plastische, Rekonstruktive und Ästhetische Chirurgie e. V. (DGPRÄC)

Deutsche Gesellschaft für Thoraxchirurgie (DGT)

Deutsche Gesellschaft für Thorax-, Herz- und Gefäßchirurgie e.V. (DGTHG)

Deutsche Gesellschaft für Unfallchirurgie (DGU)

WIR DANKEN DEN SPONSOREN FÜR DIE UNTERSTÜTZUNG DER CHIRURGISCHEN FORSCHUNG

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ANFAHRT

Standort Information BOSTER
Joseph-Schumpeter-Allee 1
53227 Bonn

ÖPNV Bonn, Konrad-Zuse-Platz (100 m)
Bonn, Ramersdorf (900 m)

Parkmöglichkeiten:
Das Parkhaus P3 liegt direkt am Konrad-Zuse-Platz am Bonner Bogen. Von hier aus sind es nur wenige Schritte bis zur Rheinufer-Promenade.

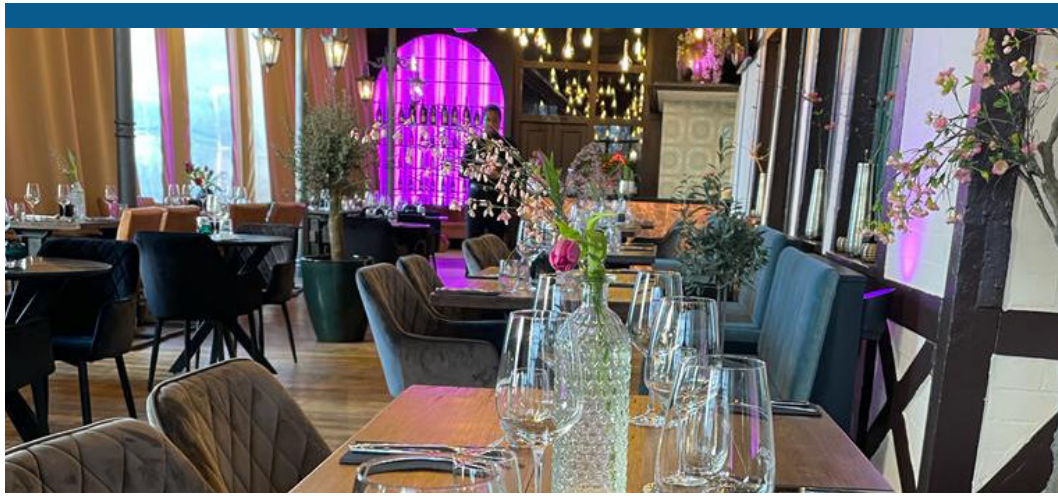
Die direkte Anbindung an das Autobahnnetz über die A 562 ermöglicht schnellen Anschluss an den Raum Köln-Düsseldorf sowie den Köln/Bonner Flughafen (18 km) und den ICE-Bahnhof Siegburg (9 km). Zur Bonner City geht es über die Konrad-Adenauer-Brücke.


QR-Code, Anfahrt BOSTER

Adresse für den Gesellschaftsabend

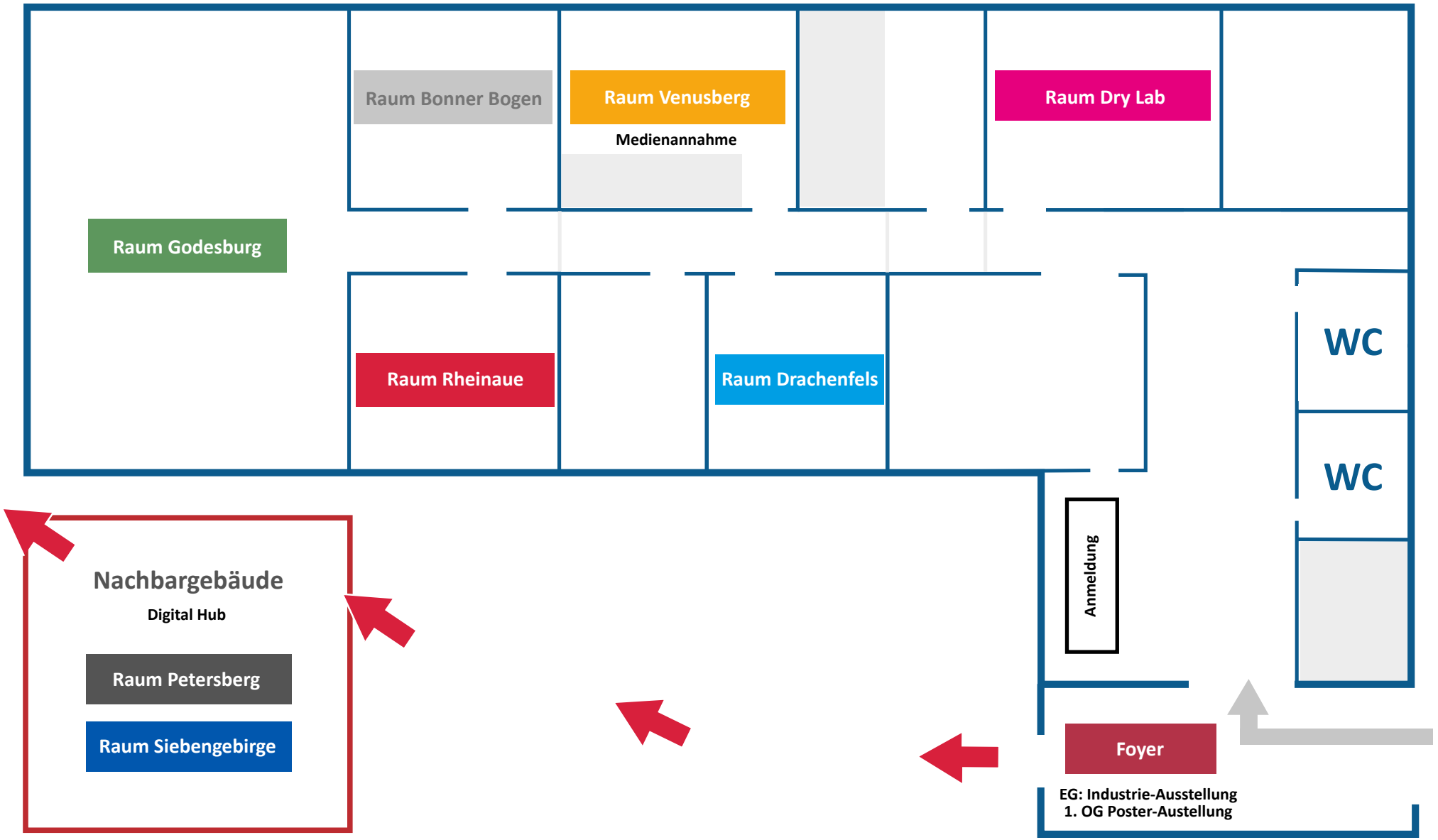
Restaurant „Bahnhöfchen“
Rheinaustraße 116
53225 Bonn

Parkmöglichkeiten:
Parkplatz Rheinaustraße (limitierte Anzahl an Stellplätzen)
oder Tiefgarage Brückenforum (Einfahrt Friedrich-Breuer-Straße).


„Ne Ovend am Rhing mit Kölsch und Wing“

LAGEPLAN BOSTER

LAGEPLAN BOSTER



PROGRAMMÜBERSICHT DONNERSTAG

PROGRAMMÜBERSICHT DONNERSTAG

Wann und Wo?	Raum Bonner Bogen	Raum Rheinaue	Raum Godesburg	Raum Drachenfels	Raum Siebengebirge	Raum Petersberg	Raum Venusberg	Raum Dry Lab	Foyer EG	Foyer 1.OG	UKB Labor
8:00-10:00											**WORKSHOP** – Koloskopie CRC Modell
10:00-12:00											**WORKSHOP** – Organoid Imaging **WORKSHOP** – Koloskopie CRC Modell
12.00-13.00	**Ankunft und Registrierung**										
13:00-13:30	**Begrüßung** Raum Godesburg										
13:30-15:00		Pancreatic Surgery	Cellular Mechanisms in Tissue Inflammation	Neue Perspektiven in der Thoraxchirurgie	Cardiac Surgery – Preclinical and Clinical Innova-tions	Digitale Inno-vationen und evidenzbasierte Versorgung in der modernen Traumatologie			Industrie-Ausstellung		
15:00-15:30	**Pause**										
15:30-17:00		Wet and Dry: All around Aneurysms and Stenosis	Molecular and Cellular Insights into upper GI Tract Cancer	Zukunft der Urologie: Robotik, Technologie und Präzision	Muskuloske-lettale Pathologien & neue Ansätze zur Versorgung				Industrie-Ausstellung		
17.00-17:30	**Pause**										
17:30-19:00	**Eröffnungsveranstaltung** Raum Godesburg										
ab 19:00	**Get-together**										

PROGRAMMÜBERSICHT FREITAG

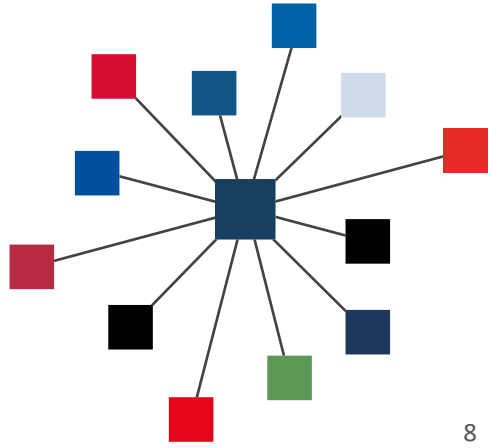
PROGRAMMÜBERSICHT FREITAG

Wann und Wo?	Raum Bonner Bogen	Raum Rheinaue	Raum Godesburg	Raum Drachenfels	Raum Siebengebirge	Raum Petersberg	Raum Venusberg	Raum Dry Lab	Foyer EG	Foyer 1.OG	UKB Seminar
08:30-10:00	Einsatz digitaler Innovationen	Hepatobilliary Surgery	Translationale Technologien in der Chirurgie: Klinische Anwendungen von Robotik und Künstlicher Intelligenz		Metabolic Surgery 2.0: Beyond Weight Loss	Muskuloskelettale Infektionen & Innovationen für Diagnose, Therapie und Prävention			Industrie-Ausstellung	Freier Besuch der Poster-ausstellung	
10:00-10:30	**Pause**										**WORKSHOP –** Spatial Transcriptomics 9.00-11.00
10:30-12:00	Nicht nur der Kittel ist grün - Planetary Health auf dem OP-Plan		Intestinal Inflammation: Woundhealing in IBD	Neurochirurgie	Skills & Beyond – Surgical Education Reloaded	Intestinale Anastomosen-heilung: Molekulare Mechanismen und Komplikations-management	SCF-Vorstands-sitzung 11.15-12.00	**WORKSHOP –** Einblicke in VR, Robotik & KI	Industrie-Ausstellung	Freier Besuch der Poster-ausstellung	
12:00-13:30		**WORKSHOP** Chirurgisches Training trifft Digitalisierung – Erleben Sie das Touch Surgery Ecosystem	**Mittagspause und Besuch der Poster-Ausstellung**				SCF-Mitglieder-versammlung 12.00-12.45			**Postersession** Meet the Presenter	
13:30-15:00	Tissue Engineering by Organoid Models		Clinical AI	Clinical Studies	Oncology: Novel Molecular Insights from in vitro Studies				Industrie-Ausstellung	Freier Besuch der Poster-ausstellung	
15:00-15.30	**Pause**										
15:30-17:00	**Preisträger*innensitzung der Sektion Chirurgische Forschung** Raum Godesburg										
17:00-17.15	**Pause**										
17.15-18.15	**Podiumsdiskussion „Zukunft der chirurgischen Forschung“** Raum Godesburg										
	Wechsel des Veranstaltungsortes										
ab 19:00	**„Ne Ovend am Rhing mit Kölsch und Wing“** Gesellschaftsabend im Restaurant „Bahnhöfchen“										

PROGRAMMÜBERSICHT SAMSTAG

PROGRAMMÜBERSICHT SAMSTAG

Wann und Wo?	Raum Bonner Bogen	Raum Rheinaue	Raum Godesburg	Raum Drachenfels	Raum Siebengebirge	Raum Petersberg	Raum Venusberg	Raum Dry Lab	Foyer EG	Foyer 1.OG	UKB
09:00-10:30	Interdisciplinary Perspectives from Surgical Research	Oncology: Mechanisms of Tumor Progression	Replace, Reduce, Refine – 3R in der Chirurgie	Kinderchirurgie besser machen – Von Mäusen, Logbüchern und neuen Devices				**WORKSHOP** Virtuelles operieren mit haptischer Rückmeldung	Industrie-Ausstellung		
10:30-11:00	**Pause**										
11:00-12:30		Innovationen in der Gynäkologischen Chirurgie	Plastische Chirurgie	**WORKSHOP** „Angeborene Bauchwanddefekte“ Praktische Übung – Fascientraktion im 3D-Modell							
ab 12:30	**Ende der Veranstaltung**										



PROGRAMM

PROGRAMM DONNERSTAG

Donnerstag 25.09.2025			Pancreatic Surgery	Raum Rheinaue
Uhrzeit 13:30-15:00 Uhr		Abstract-ID	Moderation: Irene Esposito, Heinrich-Heine Universität/Universitätsklinikum Düsseldorf Lena-Christin Conradi, University Medical Center Göttingen	Autor*innen
13:30	15+5 min	207	**Keynote:** Spatially resolved intra-tumoral heterogeneity reveals metabolic vulnerabilities in pancreatic ductal adenocarcinoma	Alexandra Maria Schmitt, et al. – Göttingen
13:50	8+3 min	124	Multicenter Identification and Validation of a Low-Abundance serum miRNA Panel for Pancreatic Cancer Detection with Cross-Disease Diagnostic Potential	Tianchi Zhou, et al. – Magdeburg
14:01	8+3 min	19	Prediction of clinical outcome parameters using ex vivo drug sensitivity of personalized tumor slice cultures in pancreatic cancer	Benjamin Heckelmann, et al. – Lübeck
14:12	8+3 min	37	Establishment of Patient-Derived PDAC Organoids and the Investigation of the Influence of Niche Factors on Tumor Subtype Classification and Therapeutic Response: study design and preliminary data	Lisa Trzebiatowski, et al. – Bochum
14:23	8+3 min	61	Comparative in vitro Study of Induced Secondary Resistance in Pancreatic Cancer Cell Lines by the Compounds GP-2250 (Misetionamide) and Olaparib	Lisa Löchter, et al. – Bochum
14:34	8+3 min	72	Efficacy of Combination Therapy with FOLFIRINOX Components and GP-2250 (Misetionamide) – An In Vitro and In Vivo Study in Pancreatic Cancer Models	Andreas Luboisch, et al. – Bochum
14:45	8+3 min	159	The Effects of Bidirectional Signaling Between Tumor and Neural Cells in Pancreatic Cancer	Nina Magewirth, et al. – Bonn
14:56	**4 min**		**Closing remarks**	

Donnerstag 25.09.2025			Cardiac Surgery – Preclinical and Clinical Innovations	Raum Siebengebirge
Uhrzeit 13:30-15:00 Uhr		Abstract-ID	Moderation: Wilhelm Röll, Universitätsklinikum Bonn, Laurenz Wolner, Medical University of Vienna	Autor*innen
13:30	15+5 min		**Keynote:** Which cells does the heart need?	Wilhelm Röll, Bonn
13:50	8+3 min	163	NLRP3 inflammasome inhibition enhances engraftment of transplanted embryonic cardiomyocytes and preserves cardiac pump function in a murine model of myocardial infarction	Esther Carls, et al. – Bonn

14:01	8+3 min	132	Induction of Long-Term Tolerance in Cardiac Allografts via Selective In Vivo Expansion of Regulatory T Cells	Laurenz Wolner, et al. – Wien
14:12	8+3 min	144	Combined cell- and gene therapy using cardiac (myo)fibroblasts: Impact on the scar cellularity and function	Miriam Schiffer, et al. – Bonn
14:23	8+3 min	158	Moloney Murine Leukemia virus complexed with magnetic nanoparticles efficiently targets the myocardial scar and reduces electrical vulnerability upon fibroblast specific Connexin 43 overexpression	Timo Mohr und Miriam Schiffer, et al. – Bonn
14:34	8+3 min	70	Chancen, Optionen und Aussichten der Digitalisierung in Lehre und Ausbildung am repräsentativen Beispiel der Herzchirurgie mit ihren Auswirkungen auf weitere chirurgische / operative Fachdisziplinen	Rauf Safarov, et al. – Magdeburg
14:45	8+3 min	241	CT-Based preoperative planning before minimally invasive heart surgery: enhancing safety and precision through digital simulation	Jacqueline Kruse, et al. – Bonn
14:56	**4 min**		**Closing remarks**	

Donnerstag 25.09.2025		Cellular Mechanisms in Tissue Inflammation	Raum Godesburg
Uhrzeit 13:30-15:00 Uhr	Abstract-ID	Moderation: Patrick Leven, Universitätsklinikum Bonn Jana Enderes, Universitätsklinikum Bonn	Autor*innen
13:30	15+5 min	**Keynote:** Too much, too little, too long, too short, 4 ways how inflammation can interfere with healing.	Sabrina Ehnert, Tübingen
13:50	8+3 min	178	Reduced Th1 Immune Response as a Marker of Preoperative Inflammaging Is Associated with Increased Postoperative Risk	Philippe Kruse, et al. – Bonn
14:01	8+3 min	34	Mitochondrial Dysfunction in Neutrophils from Trauma Patients with Type 2 Diabetes	Filiz Sahin, et al. – Tübingen
14:12	8+3 min	82	Vanillic Acid Reduces NET Formation by Inhibiting ROS Generation through Activating AMPK/AKT/Nrf2 Signaling	Yangfan Li, et al. – Tübingen
14:23	8+3 min	65	BMP-9 controls basal hepatic IL-6 expression via ALK1-signalling in macrophages	Katja Breitkopf-Heinlein, et al. – Heidelberg
14:34	8+3 min	161	Evaluation of the Inflammatory properties of Ip-visio-and Ip-S-printed surfaces	Laura Teppe, et al. – Gießen
14:45	8+3 min	146	Generating gut-specific Car Tregs to treat inflammatory bowel disease	Jessica Kümmel, et al. – Würzburg
14:56	**4 min**		**Closing remarks**	

Donnerstag 25.09.2025			Digitale Innovationen und evidenzbasierte Versorgung in der modernen Traumatologie	Raum Petersberg
Uhrzeit 13:30-15:00 Uhr		Abstract-ID	Moderation: Kristian Welle, Universitätsklinikum Bonn	Autor*innen
13:30	**15+5 min**		**Keynote:** Digitale Innovationen und evidenzbasierte Versorgung in der modernen Traumatologie	Kristian Welle, Bonn
13:50	8+3 min	171	3D-Navigations-Hybrid OP in der Unfall- und Wirbelsäulenchirurgie in einem überregionalen Traumazentrum	Dominik M. Haida, et al. – München
14:01	8+3 min	122	When Is FAST Positive? In-Vivo Evaluation of Abdominal Fluid Detection Thresholds During Sequential Fluid Instillation	Andreas Nada, et al. – Koblenz
14:12	8+3 min	134	A novel approach for synovial fluid analysis in joint infections using the scattered light integrated collector (slic)	Elio Assaf, et al. – Bonn
14:23	8+3 min	29	Sechs Jahre TraumaEvidence – Projektupdate	Denise Schulz, et al. – Düsseldorf
14:34	8+3 min	102	The impact of ATZ-DGU certification on older patients with proximal humeral fractures: A propensity score matching analysis based on health insurance data	Charlotte Ramadan, et al. – Münster
14:45	8+3 min	186	Untersuchung der Muskelaktivierung nach Frakturen der Clavicula	Mahmoud Ragab, et al. – Bonn
14:56	**4 min**		**Closing remarks**	

Donnerstag 25.09.2025			Neue Perspektiven in der Thoraxchirurgie	Raum Drachenfels
Uhrzeit 13:30-15:00 Uhr		Abstract-ID	Moderation: Hauke Winter, Thoraxklinik Heidelberg Benedetta Bedetti, Helios Klinikum Bonn/Rhein-Sieg	Autor*innen
13:30	**15+5 min**		**Keynote:** Translationale Technologien in der Chirurgie: Klinische Anwendungen von Robotik und Künstlicher Intelligenz	Hauke Winter, Heidelberg
13:50	8+3 min	7	Pure lepidic growth in core needle lung biopsy: a weak basis for surgical decision making	Benedikt Niedermaier, et al. – Heidelberg
14:01	8+3 min	219	Einsatz von Mobile App-Gestütztem Remote Patient Management in der Thoraxchirurgie: Implementierung und Adhärenz	Jan Arensmeyer, et al. – Bonn

14:12	8+3 min	206	Are there gender differences in the outcome of primary resection of solitary fibrous tumors of the pleura?	Lena Brendel, et al. – Heidelberg
14:23	8+3 min	143	Perioperative biosampling and bioanalysis facilitate advanced translational thoracic surgery research towards personalized medicine	Mircea Gabriel Stoleriu, et al. – München
14:34	8+3 min	24	Eigenschaften und Outcomes bei Patienten mit Lungenkarzinom ohne Raucheranamnese	Benedetta Bedetti, et al. – Bonn
14:45	8+3 min	204	Pulmonale Aktinomykose: Eine Herausforderung in Diagnostik und Therapie	Raffaella Griffo, et al. – Heidelberg
14:56	**4 min**		**Closing remarks**	

Donnerstag 25.09.2025			Wet and Dry: All around Aneurysms and Stenosis	Raum Rheinaue
Uhrzeit 15:30- 17:00 Uhr		Abstract-ID	Moderation: Alexander Kania, Universitätsklinikum Bonn Daphne Gray, St.-Antonius-Hospital Eschweiler	Autor*innen
15:30	**15+5 min**		**Keynote:** Expression von zirkulierenden miRNAs vor und nach Aneurysmaausschaltung	Daphne Gray, Eschweiler
15:50	8+3 min	129	Poplitealaneurysma.. oder doch Angiosarkom?	Deborah Uebermuth, et al. – Köln
16:01	8+3 min	55	Establishment of a Proton-Based MRI Method for the Detection of Ischemic Spinal Cord Injury and Evaluation of Neuroprotective Pharmacologic Interventions in a Murine Model	William Dollmeyer, et al. – Düsseldorf
16:12	8+3 min	32	Influence of short-chain fatty acids on VE-cadherin phosphorylation and alignment of human aortic endothelial cells under shear stress	Pavel Goglev, et al. – Münster
16:23	8+3 min	46	Endovaskuläre versus offene Therapie des infrarenalen Bauchaortenaneurysmas - unizentrische Beobachtungsstudie zu Therapie-Stratifizierung und „Outcome“	Feroza Ulfat, et al. – Magdeburg
16:34	8+3 min	172	Vorhersage von Typ-2-Endoleckagen nach endovaskulärer Aneurysmaausschaltung anhand der präoperativen Computertomographie-Angiographie	Louisa Bornhak, et al. – Heidelberg
16:45	8+3 min	239	Therapie periprankreatischer viszeraler Aneurysmata bei Patienten mit begleitenden viszeralarteriellen Stenosen	Marilia B. Voigt, et al. – Bonn
16:56	**4 min**		**Closing remarks**	

Donnerstag 25.09.2025			Zukunft der Urologie: Robotik, Technologie und Präzision	Raum Drachenfels
Uhrzeit 15:30- 17:00 Uhr		Abstract-ID	Moderation: Clarissa Schmidt, Universitätsklinikum Bonn Johannes Linxweiler, Universitätsklinikum des Saarlandes	Autor*innen
15:30	**10+5 min**		**Keynote I:** Of mice and men – innovative präklinische Modelle in der uroonkologischen Forschung	**Johannes Linxweiler, Homburg**
15:45	8+3 min	93	Klinische Erfolgsraten und Patient-Reported Outcomes einer lymphangiographischen interventionellen Sklerosierung aktiver Lymphleckagen nach radikaler Prostatektomie	Philipp Krausewitz, et al. – Bonn
15:56	8+3 min	87	Externe Validierung des P-Scores im DEPROMP-Studienkollektiv: Optimierte Detektion klinisch signifikanter Prostatakarzinome durch MRT und PSMA-PET/CT	Clarissa Julia Schmidt, et al. – Bonn
16:07	8+3 min	237	WATER III: Aquablation vs. transurethrale Laserenukleation bei Patienten mit LUTS und Prostatavolumen zwischen 80 und 180ml	Manuel Ritter, et al. – Bonn
16:18	8+3 min	238	KI-Mikroultraschallprojekt	Maurin H. Mangold, et al. – Heidelberg
16:29	8+3 min	22	Perioperative imaging visualization using virtual reality in oncological renal surgery.	Stefan Georgiev, et al. – Bonn
16:40	10+5 min		**Keynote II:** Intelligente Systeme und Robotik in der Urologie	**Karl-Friedrich Kowalewski, Mannheim**
16:55	**5min**		**Closing remarks**	

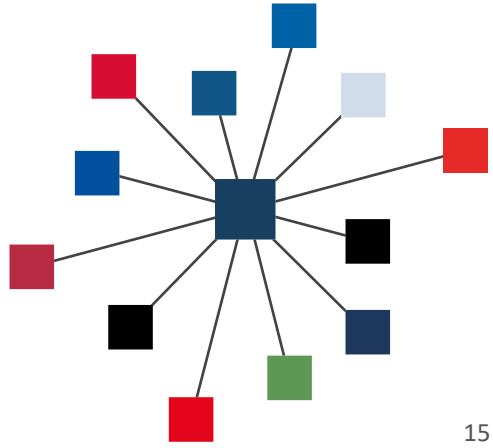
Donnerstag 25.09.2025			Molecular and Cellular Insights into upper GI Tract Cancer	Raum Godesburg
Uhrzeit 15:30- 17:00 Uhr		Abstract-ID	Moderation: Christiane J. Bruns, Universitätsklinikum Köln Martin von Websky, Uniklinik RWTH Aachen	Autor*innen
15:30	**15+5 min**		**Keynote:** AI-based protein design: A new frontier for surgery?	**Michael Hölzel, Bonn**
15:50	8+3 min	114	Activation of tumor-draining lymph nodes in esophago-gastric adenocarcinoma resistant to chemo- or radiotherapy	Loreen S. Rudek, et al. – Köln
16:01	8+3 min	26	Hochregulation von Proteinen, die mit alternativem Splicing und dem Androgensignalweg zusammenhängen, in MET-amplifizierten Adenokarzinomen des Ösophagus	Karl Knipper, et al. – Köln

16:12	8+3 min	31	Genetically modified mouse models of gastric cancer closely resemble the tumor micro-environment of their human counterparts and exhibit resistance to immune checkpoint inhibition	Kerstin Wennhold, et al. – Köln
16:23	8+3 min	174	Cancer-Associated Fibroblast-Mediated Chemoresistance in Esophageal Adenocarcinoma: Unraveling Cellular Plasticity Dynamics in the Tumor Microenvironment	Raphael Palmen, et al. – Köln
16:34	8+3 min	157	CX3CL1 Modulates Chemotherapy Response and NK Cell Activity in Esophageal Adenocarcinoma	Sophie Pters, et al. – Leipzig
16:45	8+3 min	50	Functional assessment of mutation-associated neoantigens derived from nonstop mutations in esophago-gastric adenocarcinoma	Maria A. Garcia-Marquez, et al. – Köln
16:56	**4 min**		**Closing remarks**	

Donnerstag 25.09.2025			Muskuloskelettale Pathologien & neue Ansätze zur Versorgung	Raum Siebengebirge
Uhrzeit 15:30- 17:00 Uhr		Abstract-ID	Moderation: Frank Schildberg, Universitätsklinikum Bonn Anja Niehoff, German Sport University Cologne	Autor*innen
15:30	**15+5 min**		**Keynote:** Biomarker und der Einfluss von mechanischer Belastung auf die Gelenkgesundheit	Anja Niehoff, Köln
15:50	8+3 min	81	Extrazelluläre Vesikel immortalisierter MSCs (ciMSC-EVs) - Untersuchung des therapeutischen Potenzials im Knorpelzellinflammationsmodell	Robert Ossendorff, et al. – Bonn
16:01	8+3 min	179	Live Tracking and Identification of Marker Genes for Predicting Functional Osteogenic Differentiation Potential of Mesenchymal Stromal Cells Using Spherical Nucleic Acid mRNA Nanoflare-based Sensors	El Mustapha Haddouti, et al. – Bonn
16:12	8+3 min	68	Systemic T Cell Profile Alterations Correlate with Reduced Bone Density in Individuals with Hemophilia	Surendar Jayagopi, et al. – Bonn
16:23	8+3 min	41	Influence of different distraction regimes on femoral bone regeneration in a rat model	Katrin Bundkirchen, et al. – Hannover
16:34	8+3 min	33	Impact of Proximal Humeral Fractures on Care Level in older Patients – A Propensity Score Matching Analysis of Surgical vs. Non-Operative Treatment	Jeanette Köppe, et al. – Münster
16:45	8+3 min	73	From Ablation to Reconstruction: Transforming Amputation Surgery to Restore Function and Reduce Pain	Magnus N. Kalff, et al. – Hannover
16:56	**4 min**		**Closing remarks**	

PROGRAMM
ERÖFFNUNGSVERANSTALTUNG

Donnerstag 25.09.2025		Eröffnungsveranstaltung			Raum Godesburg
Uhrzeit 17:30- 19:00 Uhr		Moderation: Jörg C. Kalff, Universitätsklinikum Bonn	Sprecher*in Name	Ort	Funktion
17:30	3 min	Begrüßung	Prof. Dr. Jörg C. Kalff	Bonn	Direktor der Klinik und Poliklinik für Allgemein-, Viszeral, Thorax- und Gefäßchirurgie
17:33	7 min	Begrüßung	Prof. Dr. Bernd Weber	Bonn	Komm. Vorstandsvorsitzender und Dekan der Medizinischen Fakultät
17:40	20 min	Medtronik und die Zukunft der Robotik: „Entwicklung made in Germany“	Jörg-Matthias Vollmann	Meerbusch	Geschäftsführer Medtronic Deutschland GmbH
18:00	20 min	DFG-Fördermöglichkeiten für chirurgische Forschung: Ein Überlick über Programme und Chancen	Dr. Hanna von Preetzmann	Bonn	DFG Referentin: Gruppe Lebenswissenschaften 3 - Medizin
18:20	20 min	Chancen durch R&D in Surgical AI in Deutschland - von der Vision zur Realität	Björn von Siemens	Berlin	Gründer und Präsident von Caresyntax
18:40	20 min	The Future of Expertise in Healthcare: How AI and Surgical Robotics Are Redefining the Role of the Surgeon	Prof. Dr. Aimee van Wynsberghe	Bonn	Direktorin des Instituts für Wissenschaft und Ethik



PROGRAMM

PROGRAMM FREITAG

Freitag 26.09.2025			Hepatobilliary Surgery	Raum Rheinaue
Uhrzeit 8:30- 10:00 Uhr		Abstract-ID	Moderation: Florian Vondran, Uniklinik RWTH Aachen Steffen Manekeller, Universitätsklinikum Bonn	Autor*innen
8:30	10+3 min	1	Application of rapid evaporative ionization mass spectrometry in preclinical and clinical analyses of steatotic liver tissues and cells	Julian C. Eckel, et al. – Leipzig
8:43	10+3 min	27	A metabolic test to tell marginal from poor quality liver grafts during machine perfusion	Charlotte von Horn, et al. – Essen
8:56	10+3 min	153	ICG Clearance Kinetics as a Functional Biomarker for Liver Graft Viability During Hypothermic Oxygenated Perfusion	Mareike Franz, et al. – Magdeburg
9:09	10+3 min	56	A Macrophage–Tumor Cross-talk: IL-1β Triggers an IL-6 Superinduction in HLE Hepatocellular Carcinoma Cells	Yuan Chu, et al. – Heidelberg
9:22	10+3 min	59	Presence of TGF-β re-sensitizes HCC cells for the potentially tumour-suppressive effects of BMP-9	Zarifa Ahmadova, et al. – Heidelberg
9:35	10+3 min	136	A strategy for inducing colorectal liver metastases in mice suitable for evaluating therapeutic interventions	Anica Maier, et al. – Würzburg
9:48	**5 min**		**Closing remarks**	

Freitag 26.09.2025			Metabolic Surgery 2.0: Beyond Weight Loss	Raum Siebengebirge
Uhrzeit 8:30- 10:00 Uhr		Abstract-ID	Moderation: Andreas Türler, Johanniter-Krankenhaus Bonn Sylvia Weiner, Krankenhaus Sachsenhausen/Universitätsklinik Frankfurt a.M.	Autor*innen
8:30	**15+5 min**		**Keynote:** Adipositasbehandlung am Scheideweg?	**Silvia Weiner, Frankfurt a.M.**
8:50	12+3 min	162	Metaryl clinical trial: nutrition and ahr activation in mesenteric adipose tissue inflammation and intestinal surgical site infections in metabolic syndrome	Patrick Leven, et al. – Bonn
9:05	12+3 min	130	Identifying risk factors for late dumping syndrome following gastric bypass surgery using an oral glucose tolerance test (OGTT).	Patrick Téoule, et al. – Ulm
9:20	12+3 min	138	Carprofen-associated anastomotic leakage following Roux-en-Y gastric bypass in mice	Philip Claus, et al. – Würzburg
9:35	**5 min**		**Closing remarks**	

Freitag 26.09.2025			Translationale Technologien in der Chirurgie: Klinische Anwendungen von Robotik und Künstlicher Intelligenz	Raum Godesburg
Uhrzeit 8:30- 10:00 Uhr		Abstract-ID	Moderation: Hauke Winter, Thoraxklinik Heidelberg Dominique Könsgen-Mustea, Universitätsklinikum Bonn	Autor*innen
8:30	**15+5 min**		**Keynote:** Translationale Technologien in der Chirurgie: Klinische Anwendungen von Robotik und Künstlicher Intelligenz	**Hauke Winter, Heidelberg**
8:50	8+3 min	5	First 50 Cases mit dem ION-Roboter-assistierten Navigations Bronchoskopie System (RNB) im regulären klinischen Einsatz in Deutschland - the Bonn Experience.	Donatas Zalepugas, et al. – Bonn
9:01	8+3 min	148	Robotisch-assistierte Leberchirurgie: Erhaltung der Immunkompetenz und Minimierung postoperativer Inflammation	Julia Maria Nagelschmitz, et al. – Magdeburg
9:12	8+3 min	23	Die Lernkurve der RATS-Thymektomie: Ergebnisse einer monozentrischen retrospektiven Studie	Benedetta Bedetti, et al. – Bonn
9:23	8+3 min	188	Evaluation of Posture in Four Different Robotic Surgical Systems	Dolores Krauss, et al. – Köln
9:34	8+3 min	139	Cologne ergonomic measurement for robotic surgery (CEMRobSurg) using the HugoTM RAS System	Stefanie Brunner, et al. – Köln
9:45	8+3 min	98	Sacropexy using the tendon of the semitendinosus muscle - 12-month follow-up of the world‘s first robotic-assisted operations	Carolin Schröder, et al. – Bonn
9:56	**4 min**		**Closing remarks**	

Freitag 26.09.2025			Einsatz digitaler Innovationen	Raum Bonner Bogen
Uhrzeit 8:30- 10:00 Uhr		Abstract-ID	Moderation: Malte Jacobsen, Universitätsklinikum Aachen Jan Arensmeyer, Universitätsklinikum Bonn	Autor*innen
8:30	10+2 min	78	From Lab to Living Room: Cyberful - Translational Virtual Reality Rehabilitation for Arm and Hand Recovery	Luis Angel Pardo Jr., et al. – Hannover
8:42	10+2 min	177	From Experience to Data: 3D Follow-Up and Morphometric Insights in Craniosynostosis Surgery	Anne Klausing, et al. – Bonn
8:54	10+2 min	128	Hyperspektralanalyse- Potenzial als Standarddiagnostikum in der Wundmedizin?	Ludwig Babel, et al. – Köln

9:06	10+2 min	221	Development of a Realistic 3D-Printed Thoracic Model for Ultrasound-Guided Intervention Training and Imaging Research	Philipp Feodorovici, et al. – Bonn
9:18	10+2 min	184	Differences between three-dimensional (3D) and two-dimensional (2D) vision on basic laparoscopic motion and force application	Josephine Runge, et al. – Dresden
9:30	10+2 min	185	Anwendbarkeit einer Mixed-Reality gestützten Herstellung von Physician-modified-Prothesen: Eine Phantom-Modellstudie	Johannes Hatzl, et al. – Heidelberg
9:42	10+2 min	9	Exploring the Potential of Virtual Reality-Based CT Imaging for Preoperative Planning in Pediatric Congenital Pulmonary Airway Malformation: A Retrospective Analysis	Donatas Zalepugas, et al. – Bonn
9:54	**6 min**		**Closing remarks**	

Freitag 26.09.2025			Muskuloskelettale Infektionen & Innovationen für Diagnose, Therapie und Prävention	Raum Petersberg
Uhrzeit 8:30- 10:00 Uhr		Abstract-ID	Moderation: Frank Schildberg, Universitätsklinikum Bonn Sascha Gravius, Universitätsklinikum Mannheim	Autor*innen
8:30	**15+5 min**		**Keynote:** Die Schattenseiten der modernen Endoprothetik: Periprothetische Infektionen als Zukunftsherausforderung	**Sascha Gravius, Mannheim**
8:50	8+3 min	104	Microbiological Profiles of Patients with Acute Periprosthetic Joint Infection undergoing Debridement, Antibiotics and Implant Retention (DAIR)	Alberto Zellner, et al. – Bonn
9:01	8+3 min	242	Diagnostik und Therapie periprothetischer Pilzinfektionen – eine interdisziplinäre Herausforderung	Sven Frieler, et al. – Bochum
9:12	8+3 min	110	Novel method for the rapid generation of antibiograms in periprosthetic joint infection-derived bacteria using Scattered Light Integrated Collector Technology	Vincent Nessler, et al. – Bonn
9:23	8+3 min	111	Ein neuartiger Ansatz für die Gewebeanalyse bei Gelenkinfektionen mit dem „Scattered Light Integrated Collector“ (SLIC)	Cosmea Amerschläger, et al. – Bonn
9:34	8+3 min	243	Analyse der antimykotischen Wirkung von Platin-Silber-Nanopatch-Oberflächen auf Basis eines Opferanodensystems	David Ullmann, et al. – Bochum
9:45	8+3 min	15	Non-invasive biomarker profiling in severe thoracic trauma: diagnostic potential of liquid biopsy	Aliona Wöhler, et al. – Koblenz
9:56	**4 min**		**Closing remarks**	

Freitag 26.09.2025			Intestinale Anastomosenheilung: Molekulare Mechanismen und Komplikationsmanagement	Raum Rheinaue
Uhrzeit 10:30- 12:00 Uhr		Abstract-ID	Moderation: Philipp-Alexander Neumann, Technische Universität München Moritz Strowitzki, Justus Liebig University Gießen	Autor*innen
10:30	**15+5 min**		**Keynote:** From Injury to Integrity - the various aspects of anastomotic healing	**Philipp-Alexander Neumann, München**
10:50	8+3 min	116	Management von Komplikationen im oberen Gastrointestinaltrakt nach externen Primäreingriffen – Eine prospektive Analyse eines zertifizierten, universitären High-Volume-Zentrums	Loreen S. Rudek, et al. – Köln
11:01	8+3 min	101	The Influence of Ileocecal Resection on Postoperative Fibrogenesis in a Preclinical Chronic Colitis Model	Kamacay Cira, et al. – München
11:12	8+3 min	160	Effects of obesity and sex on anastomotic healing and postsurgical recovery	Patrick Leven, et al. – Bonn
11:23	8+3 min	131	Tryptophan indole metabolites reduce anastomotic leakage through aryl hydrocarbon receptor-driven interleukin-22 production	Vasiliki Bantav, et al. – Bonn/Amsterdam
11:34	8+3 min	85	Biomechanical Evaluation of Fixation Methods for Porcine Intestine in Surgical Research	Saskia Janett, et al. – München
11:45	8+3 min	222	Cathepsin S (CTSS) gene expression correlates with increased rates of anastomotic leakage after lower anterior resection for colorectal cancer	Christopher Tuffs, et al. – Gießen
11:56	**4 min**		**Closing remarks**	

Freitag 26.09.2025			Skills & Beyond – Surgical Education Reloaded	Raum Siebengebirge
Uhrzeit 10:30- 12:00 Uhr		Abstract-ID	Moderation: Richard Hummel, Universitätsmedizin Greifswald Florentine Hüttl, Universitätsmedizin Mainz	Autor*innen
10:30	**15+5 min**		**Keynote:** GERMIQ: eine Initiative der DGAV für ein nationales Ausbildungscurriculum in minimalinvasiver Chirurgie	**Richard Hummel, Greifswald**
10:50	10+2 min	214	The prospective multicenter ASSESS-Trial: Benchmarking laparoscopic training in Germany	Lara Weber, et al. – Dresden

11:02	10+2 min	150	Extracurriculare Implementation eines chirurgischen Naht- und Knotenkurses für Studierende der Zahnmedizin	Benedict Jürgensen, et al. – Bonn
11:14	10+2 min	76	Crossing borders: what international exchange teaches us about skills, systems, and ourselves – life long learning in surgical education	Magnus N. Kalff, et al. – Hannover
11:26	10+2 min	210	Zukunftsangst: Man(n) allein im OP? Systemische Hürden und Geschlechterunterschiede bei der chirurgischen Facharztwahl - Erkenntnisse aus dem OP-Einführungskurs	Lazaros Milonidis, et al. – Ulm
11:38	10+2 min	135	The Surgical Track	Rabi Raj Datta, et al. – Köln
11:50	**4 min**		**Closing remarks**	

Freitag 26.09.2025			Intestinal Inflammation: Woundhealing in IBD	Raum Godesburg
Uhrzeit 10:30- 12:00 Uhr		Abstract-ID	Moderation: Nicolas Schlegel, Universitätsklinikum Würzburg Gun-Soo Hong, Universitätsklinikum Bonn	Autor*innen
10:30	**15+5 min**		**Keynote:** Neue Mechanismen der mukosalen Wundheilung und Regulation der Darmbarriere	**Nico Schlegel, Würzburg**
10:50	8+3 min	166	Local Gs-protein-mediated activation of enteric glial cells via optogenetics in a transgenic mouse model	Charlotte von Grünberg, et al. – Bonn
11:01	8+3 min	4	Glia activation is coupled with selective loss via IFNg/TNF axis in inflammatory bowel diseases	Marvin Bubeck, et al. – Erlangen
11:12	8+3 min	94	Sphingosine-1-phosphate receptor type 4 (S1PR4) deficiency differentially affects acute and chronic intestinal inflammation in a murine colitis	Celine Hähnel, et al. – Greifswald
11:23	8+3 min	99	Junctional Plakoglobin controls intestinal epithelial wound healing by regulating MAPK signaling	Marius Hörner, et al. – Würzburg
11:34	8+3 min	173	The role of glia cell line-derived neurotrophic factor (GDNF) during intestinal inflammation	Akram Abdulkadyrov, et al. – Bonn
11:45	8+3 min	183	Proteasomal activation and degradation of junctional proteins contribute to impaired barrier function in intestinal inflammation	Cathérine Kollmann, et al. – Würzburg
11:56	**4 min**		**Closing remarks**	

Freitag 26.09.2025			Nicht nur der Kittel ist grün – Planetary Health auf dem OP-Plan	Raum Bonner Bogen
Uhrzeit 10:30- 12:00 Uhr		Abstract-ID	Moderation: Johannes Klose, Universitätsklinikum Halle (Saale) Meike Lutz, Circularmed GmbH, Hamburg	Autor*innen
10:30	**15+5 min**		**Keynote:** Nachhaltige Wege in der Chirurgie - was sich jetzt ändern muss	**Johannes Klose, Halle (Saale)**
10:50	12+3 min		Nachhaltigkeit in der medizinischen Entwicklungszusammenarbeit	Walter Bruchhausen – Bonn
11:05	12+3 min		Green nudges in the form of structural workplace adjustments reduce the ecological footprint of general anaesthesia by decreasing the consumption of desflurane in the long term	Philipp Kruse – Bonn
11:20	12+3 min		Nachhaltige Forschung: Zwischen Anspruch und Umsetzung	Julia Meis-Harris – Bonn
11:35	12+3 min		Vom Abfall zum Wertstoff – Kreislaufwirtschaft im OP	Meike Lutz – Hamburg
11:50	**4 min**		**Closing remarks**	

Freitag 26.09.2025			Neurochirurgie	Raum Drachenfels
Uhrzeit 10:30- 12:00 Uhr		Abstract-ID	Moderation: Philipp Karschnia, Universitätsklinikum Erlangen Matthias Schneider, Universitätsklinikum Bonn	Autor*innen
10:30	**15+5 min**		**Keynote:** Der Stellenwert der Resektion über molekulare Gliom-Subtypen	**Philipp Karschnia, Erlangen**
10:50	7+3 min	228	Rapid Intraoperative Resection Margin Analysis in Brain Metastases Surgery via Stimulated Raman Histology and Artificial Intelligence	Lili Leyer, et al. – Köln
11:00	7+3 min	248	High-Glucose-treated nanofat improves the vascularization and integration of dermal substitutes	Valeria Pruzzo, et al. – Homburg
11:10	7+3 min	58	Tumor-associated Macrophages in Breast Cancer CNS Metastases – Spatial Distribution, Polarization, and Association with clinical Parameters	Furkan Sor, et al. – Heidelberg/ Wesseling
11:20	7+3 min	107	Bcl-xL inhibition empowers photodynamic therapy and causes a metabolic reprogramming of medulloblastoma cells in vitro	Nicolae Turcan, et al. – Ulm

11:30	7+3 min	232	Artificial-intelligence-supported Raman spectromics for intraoperative label-free spinal tumor classification	David Reinecke, et al. – Köln
11:40	7+3 min	2	Tubular Minimally Invasive Surgery for Intradural Spinal Pathologies: Expanding Dural Openings with Percutaneous Hitch Sutures	Hmimidi Douina, et al. – Erlangen
11:50	7+3 min	236	Stereo-EEG guided Radiofrequency Thermocoagulation for Drug-Resistant Focal Epilepsy: Initial Results from 15 Patients at a Tertiary Epilepsy Center	Valeri Borger, et al. – Bonn
?	?		**Closing remarks**	

Freitag 26.09.2025			Tissue Engineering by Organoid Models	Raum Bonner Bogen
Uhrzeit 13:30- 15:00 Uhr		Abstract-ID	Moderation: Ulf Kahlert, Universitätsklinikum Magdeburg Selina Wrublewsky, Universität des Saarlandes	Autor*innen
13:30	**15+5 min**		**Keynote:** Organoids in Cancer Research and Patient Care	**Elena Reckzeh, Bonn**
13:50	5+1 min		Seamless 3D Cell Culture Analysis of patient derived organoids with the novel Tecan® Spark Cyto Hybrid Plate Reader	Tobias Mortsiefer, et al. – Köln
13:56	9+3 min	8	Morphological and molecular changes in maturation of spheroids over time	Eugene J. Oh, et al. – Homburg
14:08	9+3 min	12	Generation of prevascularized spheroids for liver tissue engineering by fusion of microvascular fragments with primary hepatocytes	Caroline Bickelmann, et al. – Homburg
14:20	9+3 min	60	Leberorganoide, generiert aus humanen Gewebeproben als Model für eine Fettleber	Haristi Gaitantzi, et al. – Mannheim
14:32	9+3 min	126	Patient-derived organoid models to give insight into the phase transition of MAFLD/ MASH and cirrhosis	Robert F. Pohlberger, et al. – Aachen
14:44	9+3 min	25	Somatostatin (SST) is a crucial factor for the development of the pancreatic islet vascular network	Cedric Wilden, et al. – Homburg
14:56	**4 min**		**Closing remarks**	

Freitag 26.09.2025			Clinical AI	Raum Godesburg
Uhrzeit 13:30- 15:00 Uhr		Abstract-ID	Moderation: Jannis Hagenah, Universitätsmedizin Göttingen Jonas Henn, Universitätsklinikum Bonn	Autor*innen
13:30	**15+5 min**		**Keynote:** Wearables und KI in der Klinik: Gimmick, Gadget – oder echter Gamechanger	**Malte Jacobsen, Aachen**
13:50	8+3 min	35	Anwendung von Vision-language models (VLMs) bei der automatischen Erkennung von Knochentumoren auf Röntgenbildern	Jonas Roos, et al. – Bonn
14:01	8+3 min	105	AI-Generated Antibiotic Treatment Strategies for Acute Periprosthetic Joint Infections - A Comparative Study of AI vs. an Interdisciplinary Team of Orthopaedic Surgeons and Microbiologists	Alberto A. Zellner, et al. – Bonn
14:12	8+3 min	142	Evaluation of Current Online Large Language Models as a Decision Support Tool for Abdominal Pain in the Emergency Department	Jonas Henn, et al. – Bonn
14:23	8+3 min	141	Next-generation diagnostics in pediatric surgery: Application of artificial intelligence techniques in acute appendicitis	Marc Reismann, et al. – Berlin
14:34	8+3 min	230	Innovative Resektionsplanung in der Leberchirurgie: Anwendung von Deep-Learning-Methoden	Florentine Huettl, et al. – Mainz
14:45	8+3 min	203	Project Presentation: Developing a Multi-Institutional Platform for AI-Driven Pretherapeutic Stratification in Pancreatic Cancer	Alexander Semaan, et al. – Bonn
14:56	**4 min**		**Closing remarks**	

Freitag 26.09.2025			Oncology: Novel Molecular Insights from in vitro Studies	Raum Siebengebirge
Uhrzeit 13:30- 15:00 Uhr		Abstract-ID	Moderation: Reiner Schneider, Universitätsklinikum Bonn Anjali Röth, Uniklinik RWTH Aachen	Autor*innen
13:30	**15+5 min**	**16**	**Keynote:** Proteomic profiling reveals molecular drivers of progression from lepidic to invasive lung adenocarcinoma	**Benedict Niedermaier, et al. – Heidelberg**
13:50	8+3 min	137	Characterization of Circulating microRNAs from Molecularly Defined Tumor Models for Developing a CRISPR/Cas13a-Based Liquid Biopsy Platform for Therapy Monitoring	Ahmed Y. Sanin, et al. – Magdeburg
14:01	8+3 min	127	Carvacrol targets angiogenesis and vasculogenic mimicry in triple-negative breast cancer by blocking the TRPM7/Zn^{2+}/mTOR/RTKs signaling pathway	Tianci Tang, et al. – Homburg
14:12	8+3 min	108	Comparison of hyperthermic chemotherapy and oncolytic virotherapy in in-vitro models of peritoneal surface malignancies	Sophie E. Benezan, et al. – Tübingen
14:23	8+3 min	121	Clioquinol inhibits angiogenesis by promoting VEGFR2 degradation and synergizes with AKT inhibition to suppress triple-negative breast cancer vascularization	Yuan Gu, et al. – Homburg
14:34	8+3 min	40	Patient-Specific Pharmacogenomics unveils xCT as a Key Regulator for Druggable Metabolic and Proliferation Pathways in Colon Cancer	Marco Strecker, et al. – Magdeburg
14:45	8+3 min	112	Prolonged inhibition of tumor cell proliferation after short term starvation (STS)	Bianca Bodnarescu, et al. – Dresden
14:56	**4 min**		**Closing remarks**	

Freitag 26.09.2025			Clinical Studies	Raum Drachenfels
Uhrzeit 13:30- 15:00 Uhr		Abstract-ID	Moderation: Andreas Hecker, Universitätsklinikum Gießen & Marburg Christine Fuhrmann, Universitätsklinikum Bonn	Autor*innen
13:30	**15+5 min**		**Keynote:** Personalisierte Therapie in der HPB-Chirurgie? - Ein update und Ausblick zu klinischen Studien	**Andreas Hecker, Gießen & Marburg**
13:50	8+3 min	192	Insight into Appendicular Lumina - a Prospective Study of the Prevalence of Appendicoliths by Intraoperative Extracorporeal Incision in Acute Appendicitis	Jonas Pachmann, et al. – Magdeburg
14:01	8+3 min	119	Sigmoid diverticulitis - do we follow the rules? Adherence to the guideline in a single German centre	Felix Rückert, et al. – Speyer
14:12	8+3 min	169	International multicenter Study of Real-Worl Outcomes in Minimally Invasive Resection of Non-small Cell Lung Cancer after Chemoimmunotherapy	Philipp Schnorr, et al. – Bonn
14:23	8+3 min	168	Evaluation of an Evidence-Based Self-Assisted Physiotherapy Approach to Scapulothoracic Dyskinesis: A Pilot Study	Jakob Zapatka, et al. – Bonn
14:34	8+3 min	74	Bridging Surgical Innovation and Function: A non-invasive Feedback System to Improve Gait After Limb Loss	Magnus N. Kalff, et al. – Hannover
14:45	8+3 min	165	Evaluation of a digital health application to increase compliance and empowerment in patients with short bowel syndrome and home parenteral nutrition: results of a pilot study	Regine Wlecke, et al. – Bonn
14:56	**4 min**		**Closing remarks**	

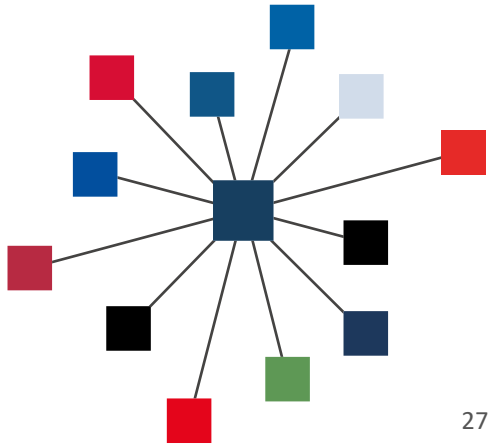
PROGRAMM

PREISTRÄGER*INNENSITZUNG

Freitag 26.09.2025			Preisträger*innensitzung der Sektion Chirurgische Forschung	Raum Godesburg
Uhrzeit 15:30- 17:00 Uhr		Abstract-ID	Moderation: Sven Wehner, Universitätsklinikum Bonn Matthias Laschke, Homburg	Autor*innen
15:30	3 min		Einleitung	Matthias Laschke – Homburg Sven Wehner – Bonn
15:33	**12+3 min**		**Keynote:** AI-enabled Surgical Video Analysis: Steps Towards Clinical Relevance	**Fiona Kolbinger – Dresden**
15:48	10+2 min	207	Spatially resolved intra-tumoral heterogeneity reveals metabolic vulnerabilities in pancreatic ductal adenocarcinoma	Lena-Christin Conradi – Göttingen
16:00	10+2 min	167	Refinement and Replacement in Aortic Research	Agnesa Mazrekaj – Düsseldorf
16:12	10+2 min	124	Multicenter Identification and Validation of a Low-Abundance serum miRNA Panel for Pancreatic Cancer Detection with Cross-Disease Diagnostic Potential	Tianchi Zhou – Magdeburg
16:24	10+2 min	4	Glia activation is coupled with selective loss via IFNg/TNF axis in inflammatory bowel diseases.	Jay Patankar – Erlangen
16:36	10+2 min	232	Artificial-intelligence-supported Raman spectromics for intraoperative label-free spinal tumor classification	Nina Müller – Köln
16:48	**12 min**		**Abstimmung und Preisverleihung**	

PROGRAMM
PODIUMSDISKUSSION

Freitag 26.09.2025		Podiumsdiskussion „Zukunft der Chirurgischen Forschung“		Raum Godesburg
Uhrzeit 17:15- 18:15 Uhr		Moderation: Prof. Dr. Jörg C. Kalff, Universitätsklinikum Bonn		
Uhrzeit			**Teilnehmer*in**	**Institution**
17:15	**50 min**	**Podiumsdiskussion**	Dr. Andreas Meszaros	Uniklinik Innsbruck
			Prof. Dr. René Tolba	Uniklinik RWTH Aachen
			Prof. Dr. Thomas Schmitz-Rixen	DGCH, Berlin
			Prof. Dr. Jannis Hagenah	Universitätsmedizin Göttingen
			Dr. Christine Fuhrmann	Universitätsklinikum Bonn
			Alexandra Jürgens	Fraunhofer-Institut für Digitale Medizin. MEVIS, Bremen
			PD Dr. med. Dipl. Phys. Anjali A. Röth	Uniklinik RWTH Aachen
			Prof. Dr. Dirk Wilhelm	TUM München
18:05	**10 min**	**Closing Remarks & Danksagung**	Prof. Dr. Jörg C. Kalff	Universitätsklinikum Bonn

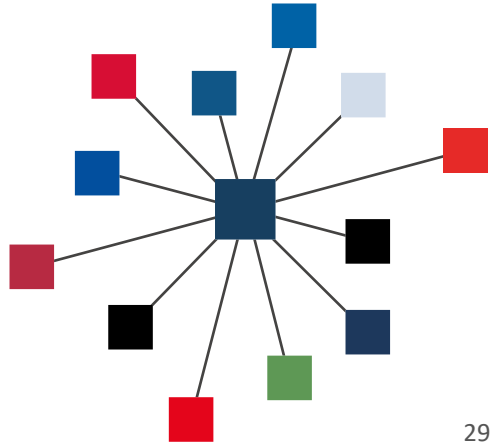


PROGRAMM

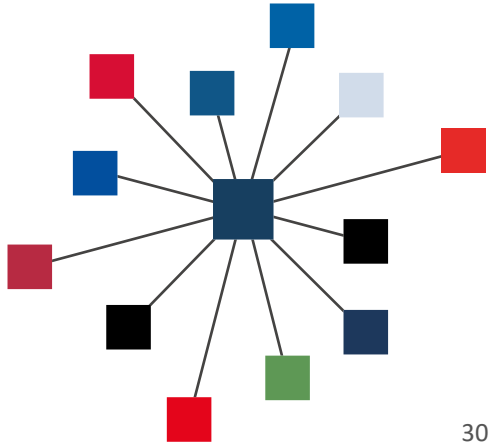
PROGRAMM SAMSTAG

Samstag 27.09.2025			Interdisciplinary Perspectives from Surgical Research	Raum Bonner Bogen
Uhrzeit 09:00- 10:30 Uhr		Abstract-ID	Moderation: Reiner Schneider, Universitätsklinikum Bonn und Michael Meir, Universitätsklinikum Würzburg	Autor*innen
09:00	8+3 min	67	A New Therapeutic Target for Osteoporosis: Arcyriaflavin A as a CDK4 Inhibitor Suppressing Osteoclastogenesis	Mengbo Zhu, et al. – Bonn
09:11	8+3 min	62	BMP-9: A modulator of pro-inflammatory immune responses in macrophages	Meyrem Nur Sitar, et al. – Heidelberg
09:22	8+3 min	43	Dickkopf-3 (DKK3), a new player in regulating insulin signal transduction.	Hanna Koch, et al. – Homburg
09:33	8+3 min	115	pHSP27 represents a potential mechanism of resistance against CUSP9v3 in medulloblastoma	Marlene Uhl, et al. – Ulm
09:44	8+3 min	200	The effects of bile microbioma, bile stenting and antibiotic therapy on postoperative morbidity in pancreatic head resections A unicenter, retrospective analysis	Patricia Wyzlic, et al. – Köln
09:55	8+3 min	213	Surgical Strategy in Acute Mesenteric Ischemia: Planned vs. On-Demand Relaparotomy - A Question of Survival	Mona Breßer, et al. – Bonn
10:06	8+3 min	164	PRESS-PAR: Early detection and PREvention of Symptomatic postSurgical hypoPARathyroidism after thyroid surgery	Michael Meir, et al. – Würzburg
10:17	8+3 min	246	Stimulation wundheilungsrelevanter Faktoren in humanen Gingivafibroblasten durch Nicht-invasives physikalisches Plasma (NIPP) in vitro“	Benedikt Eggers, et al. – Bonn
10:28	**2 min**		**Closing remarks**	

Samstag 27.09.2025			Oncology: Mechanisms of Tumor Progression	Raum Rheinaue
Uhrzeit 09:00- 10:30 Uhr		Abstract-ID	Moderation: Anne Klausing, Universitätsklinikum Bonn Vittorio Branchi, Universitätsklinikum Bonn	Autor*innen
09:00	10+3 min	170	From primary to lymph node: Spatially resolving cancer cell subtypes and their TME in PDAC	Daniel Weissinger, et al. – Bonn
09:13	10+3 min	244	Antitumoraler Effekt von Nicht-invasivem physikalischem Plasma bei der Behandlung oraler Plattenepithelkarzinom-Resektate ex vivo	Gesa Tschuck, et al. – Bonn
09:26	10+3 min	100	Blockade of the Prostaglandin-2 (PGE2) pathway inhibits the growth of PTEN deficient HNSCC tumors	Marius Hörner, et al. – Würzburg
09:39	10+3 min	176	Smart ICU Planning in Head and Neck Surgery: Translating Surgical Complexity into Predictive Insight	Anne Klausing, et al. – Bonn
09:52	10+3 min	83	Tailoring Nanocarrier Interfaces: Comparative Evaluation of Polymer-Coated Chrysin-Iron Oxide Nanoparticles for Colon Cancer Therapy	Sabina Hajizada, et al. – Mannheim
10:05	10+3 min	118	Association Between Insulin Surrogates and Esophageal Cancer Risk: Findings from a Prospective UK Biobank Cohort Study	Chuang Yang, et al. – Leipzig
10:18	10+3 min	28	Elevated BMP-9 expression predicts better prognosis in colorectal cancer	Ting Jiang, et al. – Heidelberg
			Closing remarks	



Samstag 27.09.2025			Replace, Reduce, Refine – 3R in der Chirurgie	Raum Godesburg
Uhrzeit 09:00- 10:30 Uhr		Abstract-ID	Moderation: René Tolba, Uniklinik RWTH Aachen Marta Stei, Universitätsklinikum Bonn	Autor*innen
09:00	**15+5 min**		**Keynote:** Innovative Ansätze für das 3R-Prinzip: Bayessche Statistik und fortgeschrittene Fallzahlplanung in der tierexperimentellen Forschung	**Steven Talbot, Hannover**
09:20	10+2 min		3R-Kompetenznetzwerk NRW – Medizinischer Fortschritt im Einklang mit bestmöglichem Tierschutz	Michael To Vinh, Bonn
09:32	10+2 min	167	Refinement and Replacement in Aortic Research	Agnesa Mazrekaj, et al. – Düsseldorf
09:44	10+2 min	84	Effect and feasability of thermal ablation techniques in an in-ovo model of pancreatic cancer	Christian Ballmeyer, et al. – Düsseldorf
09:56	10+2 min		Tierexperimentelle chirurgische Forschung: Risiko, Fehler, Fortschritt – Wege zu einer positiven Fehlerkultur	Sabine Bischoff - Hannover
10:08	10+2 min		Animal Training as a Tool for Refinement in Large Animal Surgery	Lisa Ernst - Aachen
10:20	**5 min**		**Closing remarks**	



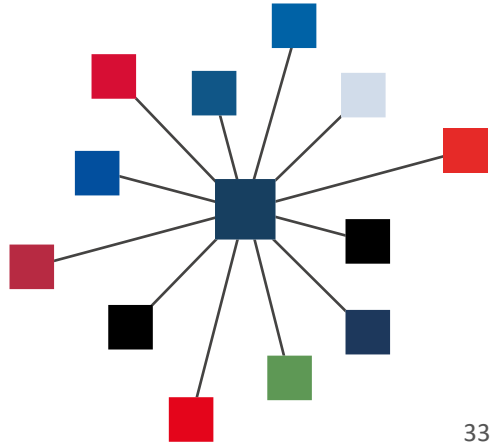
Samstag 27.09.2025			WORKSHOP: Virtuelles operieren mit haptischer Rückmeldung	Raum Dry Lab
Uhrzeit 09:00- 10:30 Uhr			Moderation: Björn Krüger, Universitätsklinikum Bonn Kristian Welle, Universitätsklinikum Bonn	
Uhrzeit			**Titel**	**Sprecher*in**
09:00	**10 min**		Einleitung: Virtuell operieren mit haptischer Rückmeldung – Wofür?	Kristian Welle, Bonn
09:10	**75 min**	**Station 1**	sawbone – Sprunggelenksfraktur	
		Station 2	Digitales OP-Training – "Werkzeugkasten"	
		Station 3	Haptische Bohr- und Schraubsimulation	
		Station 4	Weichteilsimulation und -manipulation	
10:25	**5 min**		**Closing remarks**	

Samstag 27.09.2025			Kinderchirurgie besser machen – Von Mäusen, Logbüchern und neuen Devices	Raum Drachenfels
Uhrzeit 09:00- 10:30 Uhr		Abstract-ID	Moderation: Christina Oetzmann von Sochaczewski, Universitätsklinikum Bonn Marietta Jank, Universitätsklinikum Mannheim	Autor*innen
09:00	8+3 min	10	Video-Assisted Thoracoscopic Surgery in Infants and Young Children: Assessing Feasibility and Limitations	Donatas Zalepugas, et al. – Bonn
09:11	8+3 min	216	Cable ties for lateral plate fixation in minimal invasive repair of pectus carinatum (MIRPC)	Stephan Rohleder, et al. – Mainz
09:22	8+3 min	211	Oesophageal length in outbred mice can be predicted by age and crown-rump length	Maximiliane von Stumberg, et al. – Bonn
09:33	8+3 min	193	Using Blount´s sling does not seem to be associated to secondary dislocations following closed reduction of a supracondylar fracture	Sophie Maasewerd, et al. – Bonn
09:44	8+3 min	181	Systematic requirement analyses for smartphone apps in pediatric surgery	Tessa M. Hermann, et al. – Mannheim
09:55	8+3 min	194	Paediatric pilonidal sinus treatment in Germany – a nationwide survey of paediatric surgeons	Giada Corturillo, et al. – Bonn
10:06	8+3 min	198	Fasciotens pediatric® for simple and complex gastroschisis – a monocentric cohort compared to a meta-analytic benchmark indicates a potential benefit in time to full enteral feeds	Joanna Strohm, et al. – Bonn
10:17	8+3 min	197	Defining entrustable professional activities for german medical students during their final year clinical clerkship in pediatric surgery	Alina Schacherl, et al. – Mannheim
10:28	**2 min**		**Closing remarks**	

Samstag 27.09.2025			WORKSHOP: Angeborene Bauchwanddefekte. Praktische freie Übungen am 3D-gedruckten Modell mit neuem Behandlungsansatz Faszientraktion		Raum Drachenfels
Uhrzeit 11:00- 12:30 Uhr			Moderation: Joanna Strohm, Universitätsklinikum Bonn Britta Lüken-Darius, Universitätsklinikum Bonn		
Uhrzeit				**Titel**	**Sprecher*in**
11.00-12.30	**10 min**			Einführung	Joanna Strohm, Bonn
	75 min	**Demonstration**		Anlage der Nähte und Zuganlage und -steigerung unter Therapie	Joanna Strohm & Britta Lüken-Darius, Bonn
		Workshop Teil 1		Anlegen und Einspannen der Nähte durch die Teilnehmer	
		Workshop Teil 2		Steigerung der Zugeblastung unter Therapie	
		Bisherige Erfahrungen		Nachbehandlung nach Abdomenverschluss – Lessons Learned	
	5 min	**Closing remarks**			

Samstag 27.09.2025			Innovationen in der Gynäkologischen Chirurgie	Raum Rheinaue
Uhrzeit 11:00- 12:30 Uhr		Abstract-ID	Moderation: Lucia Otten, Universitätsklinikum Bonn Pia Lodde, Universitätsklinikum Bonn	Autor*innen
11:00	8+3 min	209	Vessel sparing rectosigmoid resection (VSRR) in gynecologic oncology	Eva K. Egger, et al. – Bonn
11:11	8+3 min	175	Prospective multicenter registry study on sacropexy using the semitendinosus tendon for apical prolapse repair – an interim analysis	Carolin Schröder, et al. – Bonn
11:22	8+3 min	113	Intraoperative Utilization of Laser Speckle Contrast Imaging(LSCI) in Direct -to-Implant Breast Reconstruction Following Mastectomy - a Single Center Observational Study	Anne Bachmann, et al. – Bonn
11:33	8+3 min	64	Behandlung gynäkologischer Erkrankungen mittels minimal-invasiver Operations-verfahren: explorativer Vergleich von Laparoskopie und Roboter-assistierter Chirurgie im Hinblick auf Patient-Reported Outcome, sowie peri- und postoperative Morbidität	Lara K. Müller, et al. – Bonn
11:44	8+3 min	109	Non-invasive physical plasma for the treatment of vulvar intraepithelial neoplasia	Karla Feodorovici, et al. – Bonn
11:55	8+3 min	13	Impact of 4DryField® PH as a hemostatic agent in Ovarian Surgery on Fertility	Laura Tascón Padrón, et al. – Bonn
12:06	**4 min**		**Closing remarks**	

Samstag 27.09.2025			Plastische Chirurgie	Raum Godesburg
Uhrzeit 11:00- 12:30 Uhr		Abstract-ID	Moderation: Klaus J. Walgenbach, Universitätsklinikum Bonn Jennifer Landsberg, Universitätsklinikum Bonn	Autor*innen
11:00	8+3 min	223	Modeling Antiviral Immunity in Human Skin: Insights from Ex Vivo Culture Systems	Julius Lingau, et al. – Bonn
11:11	8+3 min	45	High-Glucose-treated nanofat improves the vascularization and integration of dermal substitutes	Valeria Pruzzo, et al. – Homburg
11:22	8+3 min	225	Einfluss der postbariatrischen Behandlung auf die Liposuktionstherapie des Lipödems im Stadium III	Yaren Usluer, et al. – Bonn
11:33	8+3 min	140	Fracture-related Infektionen (FRI) am Unterschenkel erfolgreich behandeln: 5-Jahres-Ergebnisse eines orthoplastischen Zentrums	Anna L. Gerlach, et al. – Ludwigshafen
11:44	8+3 min	227	Rekonstruktion von Bauchdeckendefekten nach offener Abdominalbehandlung mit Perforatorlappen des superioren und tiefen inferioren epigastrischen Gefäßsystems	Annika B. Scheer, et al. – Bonn
11:55	8+3 min	226	Reduzieren Perforatorlappenplastiken bei der thorakalen und sternalen Rekonstruktion den postoperativen Albuminverlust und Transfusionsbedarf im Vergleich zu Muskellappenplastiken?	Martin C. Lam, et al. – Bonn
10:26	**4 min**		**Closing remarks**	



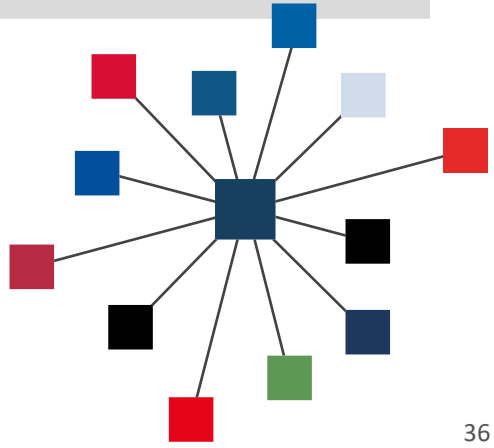
POSTER-AUSTELLUNG

POSTER-AUSSTELLUNG

Uhrzeit 12:30- 13:30 Uhr	Poster-Ausstellung	Raum: Foyer 1.OG
Abstract-ID	Titel	Autor*innen
6	Patient-Centred Pathways: Implementierung der ION-Roboter-assistierten Navigations Bronchoskopie (RNB) mit konsekutiver Lungenresektion als „Single Anesthesia Event“	Donatas Zalepugas, et al. – Bonn
14	LiBOD™ – Sepsis: A Prospective Military-Civilian Initiative for Early Sepsis Detection Using Small Extracellular Vesicles – a project outline	Angelina Klein, et al. – Koblenz
18	Differences in adipose tissue function in obese patients and their influence on postoperative outcomes in bariatric surgery.	Luise J. Ahlers, et al. – Bonn
30	Intestinal Failure in Germany: Current estimate of prevalence, medical care situation and patient characterization – Update 2025	Verena Stolz, et al. – Bonn
36	Molecular evaluation of the impact of the antineoplastic substance Misetionamide on the cMYC pathway in pancreatic cancer: an in vitro study	Britta Majchrzak-Stiller, et al. – Bochum
47	Indizierte offen-gefäßchirurgische Versorgung eines A.-pancreaticoduodenalis-Aneurysmas (APD) bei begünstigend ursächlichem Verschluss des Truncus coeliacus	Tobias Röthig, et al. – Magdeburg
57	5-Aminolevulinic Acid (5-ALA) for Intraoperative Imaging in Patients with Ovarian Cancer – a Single Center Feasibility Study (ILLUMINATE)	Damian Ralser, et al. – Bonn
71	Investigation of Molecular Risk Factors and Characteristics of Postoperative Pancreatic Fistula	David Wiedemann, et al. – Bochum
86	DEPROMP Studie: Konkordanz der Prostatakarzinomausdehnung zwischen MRT, PSMA-PET/CT und Histopathologie	Clarissa J. Schmidt, et al. – Bonn
91	Growth Differentiation Factor 15 Drives Therapy Resistance Through Tumor–CAF Crosstalk and Immune Modulation in Esophageal Adenocarcinoma	Zicheng Lyu, et al. – Köln
92	Einfluss des intraoperativen Flüssigkeitsmanagements auf Komplikationen nach roboterassistierter laparoskopischer radikaler Prostatektomie: Ein Risikofaktor für Lymphozelen	Thomas Büttner, et al. – Bonn
95	Neuroendocrine Pancreatic Tumors: Evaluation of Novel Synergistic Therapeutic Approaches with Misetionamide in Organoid Models	Leonhard Gutberger, et al. – Bochum
97	Burch colposuspension for stress urinary incontinence in women – results of a retrospective clinical trial	Carolin Schröder, et al. – Bonn

Uhrzeit 12:30- 13:30 Uhr	Poster-Ausstellung	Raum: Foyer 1.OG
Abstract-ID	Titel	Autor*innen
103	A comparative study of the injury patterns and inflammatory response between suicidal and unintentional falls from height (in Germany)	Alberto A. Zellner, et al. – Bonn
106	Einfluss von Komorbiditäten und perioperativer nicht-chirurgischer Anästhesiezeit auf schwerwiegende Komplikationen nach inverser Schulterendoprothetik bei Frakturversorgung	Mohammad Jarrah, et al. – Bonn
133	A novel approach for tissue analysis in joint infections using the scattered light integrated collector (slic)	Elio Assaf, et al. – Bonn
145	The Role of Enteric Glial Cells and Enteric Neurons in Shaping the Colorectal Cancer Tumor Microenvironment.	Ebrahim Hamza, et al. – Bonn
147	The lighthouse project “Preclinical Models” of the Bavarian Cancer Research Center (BZKF)	Christoph Otto, et al. – Würzburg
149	Inhibition of RNA Pol I sensitizes colorectal cancer cells to ATR inhibition by inducing transcription-replication conflicts	Deinlein Hanna, et al. – Würzburg
151	Digitale Abläufe in der Versorgung von Orbitabodenfrakturen: vom 3D-Druck bis zum individuellen Mesh	Benedict Jürgensen, et al. – Bonn
154	Interleukin-10 Protects Intestinal Epithelial Barrier Function by activation of the JAK1/STAT3-pathway	Constanze K. Binder, et al. – Würzburg
156	Enteric neurodegeneration leads to motility impairment during postoperative gut inflammation	Mona Breßer, et al. – Bonn
180	Green nudges in the form of structural workplace adjustments reduce the ecological footprint of general anaesthesia by decreasing the consumption of desflurane in the long term	Leonard Santen, et al. – Bonn
182	Veni, vidi, operavi – Kursvideo als Booster für Selbstsicherheit im OP?	Lazaros Milonidis, et al. – Ulm
189	Personalized Evaluation and Training of Surgical Ergonomics for Trainees During Robotic Assisted Minimally Invasive Surgery	Dolores T. Krauss, et al. – Köln
190	Developmental Maturation of Intestinal Junctional Complexes in Extremely Preterm Infants	Cathérine Kollmann, et al. – Würzburg
195	Non-reproducibility in the murine model of postoperative ileus: On in- and outbred strains, variability and intestinal lengths	Ejder Akinci, et al. – Bonn
196	The resistance to traction forces differs substantially between intestinal parts of different mice strains	Berkan Ertim, et al. – Bonn

Uhrzeit 12:30- 13:30 Uhr	Poster-Ausstellung	Raum: Foyer 1.OG
Abstract-ID	Titel	Autor*innen
199	Biochemical Snapshot- a time saving approach to replace frozen sections in parathyroid surgery	Regina Pistorius, et al. – Würzburg
202	Intra- and postoperative transfusion of blood products and the effect on postoperative morbidity in pancreatic head resections- A unicenter, retrospective analysis	Patricia Wyzlic, et al. – Köln
205	Inflammatory Signals as a prognostic factor for Acute Appendicitis Stages According to EAES 2015 Guidelines	Pia Meyer zu Himmern, et al. – Magdeburg
208	Prätherapeuthische Aufklärung vor antiresorptiver Therapie: Untersuchung interdisziplinärer Therapie und Kommunikation, Aufklärungskonzepten, Kommunikationsprozessen und der Patientenmeinung zur Aufklärung.	Shirin Omar, et al. – Bonn
212	Both oesophago-oesophageal and duodeno-oesophageal anastomoses are inferior to the native oesophagus in terms of breaking force	Raphael Palmen, et al. – Köln
220	The value of perioperative anemia in spinal metastases in the context of neurosurgical-oncological treatment	M. Janijc, et al. – Bonn
224	Impact of patient age and trauma mechanisms on clavicle fractures	Suncanca van Hattem, et al. – Bonn
229	Vergleich der präoperativen Bildqualität bei perihilären Cholangiokarzinomen: Photon-Counting-CT versus konventionelle CT-Technologie	Viola Ehses, et al. – Mainz
233	Determining the Influence of CAF-secreted factors on radiotherapy resistance in rectal cancer	Lukas B. Kowitzke, et al. – Göttingen
235	Seizure freedom achieved with SEEG-guided thermocoagulation in drug-resistant focal epilepsy from a hypothalamic hamartoma: a case report	Amirhossein Babaee, et al. – Bonn



ABSTRACTS

ABSTRACTS

ID1

Application of rapid evaporative ionization mass spectrometry in preclinical and clinical analyses of steatotic liver tissues and cells

Eckel, J.[1], Seidemann, L.[2], Albadry, M.[3], Schicht, G.[1], Skvoznikova, M.[2], Nickel, S.[3], Hänsel, R.[4], Seehofer, D.[4], Hiller, G.[4], Tautenhahn, H.[4], Dahmen, U.[2], Damm, G.[1]

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[2] Department of Hepatobiliary Surgery and Visceral Transplantation, Clinic for Visceral, Transplant, Thoracic and Vascular Surgery, Leipzig University Medical Center, Leipzig, Germany

[3] Department of General, Visceral and Vascular Surgery, Experimental Transplantation Surgery, University Hospital Jena, Jena, Germany.

[4] Institute for Medical Informatics, Statistics and Epidemiology (IMISE), Leipzig University, Leipzig, Germany.

Metabolic dysfunction-associated steatotic liver disease (MASLD) is the most common chronic liver disease worldwide and is characterized by excessive hepatic lipid accumulation. The intraoperative characterization of liver tissue remains limited to visual inspection or delayed histological analysis, and is dependent on human interpretation. This study investigates the application of Rapid Evaporative Ionization Mass Spectrometry (REIMS) an ambient ionization technique that enables direct lipidomic profiling without sample preparation. In two variants the potential of REIMS is explored, with the electrosurgical knife (iKnife) and a heating system (HS), for characterizing steatotic liver tissues and hepatocyte suspensions in both clinical and preclinical settings. A total of 39 frozen liver tissue samples from two German university hospitals were analyzed with iKnife-coupled REIMS. To introduce the newly developed HS-REIMS protocol, in vitro steatosis was induced in primary human hepatocytes which allowed standardized cell input and evaporation. To validate the approach the method was compared to a steatosis mouse model using the established iKnife. Lastly another new protocol was established which made it possible to measure lipid standards with the iKnife. REIMS data were processed using Progenesis Qi and Python-based bioinformatics pipelines. A total of 1449 mass signals were identified, primarily representing triacylglycerides (TAG), fatty acids (FA), and glycerophospholipids (GPL). Surprisingly, TAG signal intensity did not increase proportionally with the degree of steatosis, while FA and GPL dominated the fingerprint. Oleic acid and ceramides emerge as potential marker lipids in the human datasets. Notably the introduction of lipid standards revealed degradation patterns which in turn highlighted the influence of ionization conditions. REIMS provides meaningful and distinct fingerprints, but our work highlights the importance of preanalytical sample standardization. At present REIMS is still a preclinical application but shows promise as a tool for intra-operative application. Further work will focus on optimization of the bioinformatic analysis by usage of machine learning for a robust diagnostic decision making.

No conflict of interest.

ID2

Tubular Minimally Invasive Surgery for Intradural Spinal Pathologies: Expanding Dural Openings with Percutaneous Hitch Sutures

Hmimidi, D.[1], Heiland, D.[1], Delev, D.[1], Schnell, O.[1], Masalha, W.[1]

[1] Neurochirurgie, Uniklinik Erlangen

The use of tubular systems for the treatment of intradural spinal pathologies poses significant challenges due to limited visualization caused by the small dural opening. This restricted view can complicate surgical maneuverability and hinder effective resection. We applied a novel minimally invasive technique in 10 surgeries involving intradural spinal pathologies. After positioning the tubular retractor system and exposing the dura, Dural hitch sutures were placed and percutaneously externalized using a Cushing cannula. These sutures were used to elevate and expand the dural opening, allowing improved access and visualization. The application of percutaneous dural hitch sutures significantly widened the dural opening compared to traditional tubular methods. This enhanced the surgical field, enabling safer and more effective resection of intradural pathologies. This innovative technique demonstrates that percutaneous dural hitch sutures can overcome the limitations of tubular minimally invasive approaches for intradural spinal surgeries. By expanding the dural opening, it offers improved visualization and maneuverability, potentially leading to better clinical outcomes. Further studies are needed to validate these findings in larger cohorts.

No conflict of interest.

ID4

Glia activation is coupled with selective loss via IFNg/TNF axis in inflammatory bowel diseases.

Bubeck, M.[1], Penkert, K. A.[2], Limberger, H.[1], Acera, M. G.[1], Plattner, C.[3], Ziegler, S.[2], Chichung Lie, D.[4], Becker, C.[1], Patankar, J. V.[1]

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[3] Biocenter, Institute of Bioinformatics, Medical University of Innsbruck, Innsbruck, Austria

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Enteric glial cells (EGC) play a crucial role in maintaining gut homeostasis, but their dysregulation in inflammatory bowel diseases (IBD) remains poorly understood. Emerging preclinical data suggests activated EGC have beneficial roles in controlling gut pathophysiology. Understanding EGC activation and adaptation during experimental and clinical IBD. We provide the first highly integrated approach to identify EGC activation signature in IBD. Profiling 390 samples from IBD patients via bulk and single-nucleus (sn) transcriptomics and replicate the findings on publicly available bulk and single-cell (sc) datasets from 1160 patients and 19,000 single EGC. Preclinical modelling of Th1/Th17 inflammation, reporter66 assisted EGC sorting, analysis of regulated cell death, and Casp8 ablation in EGC was performed. Results: We identified novel IBD type and sampling associated EGC activation signature. Specific EGC activation markers were shared in biopsies and resection specimens, and were divergent between Crohn's disease and Ulcerative colitis. Preclinical modelling of intestinal inflammation identified combinatorial TNF and IFN-γ-driven activation of EGC, associated with elevated necroptosis, and negatively impacting gut motility. Genetic-reporter enabled sorting and downstream analyses confirmed TNF and IFN-γ-driven EGC necroptosis, potentiated by Casp8 deficiency. Furthermore, snRNA-Seq from IBD patient samples confirmed elevated cell death signature in activated but not in rare neuroglia progenitor-like cluster. Our findings identify IBD type-associated activated EGC markers involved in immune and epithelial homeoastasis. We uncover necroptosis of activated EGCs as a constituent of intestinal inflammation. Advancing our understanding of activated EGC survival is pivotal in elucidating their complex roles in maintaining gut immune-epithelial homeostasis.

No conflict of interest.

ID5

First 50 Cases mit dem ION-Roboter-assistierten Navigations Bronchoskopie System (RNB) im regulären klinischen Einsatz in Deutschland - the Bonn Experience.

Zalepugas, D.[1,2], Menghesha, H.[1,2], Skowasch, D.[2], Arensmeyer, J.[2], Feodorovici, P.[2], Schmidt, J.[1,2]

[1] Department of Thoracic Surgery, Helios Clinic Bonn/Rhein-Sieg, 53123 Bonn, Germany

[2] Division of Thoracic Surgery, Department of Surgery, University Hospital Bonn, Bonn, Germany

Die Diagnostik kleiner peripherer Lungenrundherde (LRH) gewinnt insbesondere im Kontext des bevorstehenden Lungenkrebsscreenings und der daraus resultierenden Behandlungsempfehlungen zunehmend an Bedeutung. Die regelhafte klinische Einführung des ION-RNB stellt in Deutschland eine Innovation dar, während die klinischen Erfahrungen in den USA bereits vielversprechende Ergebnisse gezeigt haben. Ziel dieser Studie ist es, die Ergebnisse unserer ersten 50 mit dem ION-System untersuchten Patienten zu präsentieren. Es handelt sich um eine retrospektive, monozentrische Analyse. Eingeschlossen wurden die ersten Patienten, die in der Klinik für Thoraxchirurgie und in der Klinik für Pneumologie eine Rundherddiagnostik mit dem ION-Systems erhielten. Insgesamt wurden 50 Patienten untersucht, davon 24 aus der Thoraxchirurgie und 26 aus der Pneumologie. Die LRH befanden sich zu 74 % in der peripheren, zu 18 % in der mittleren und zu 8 % in der zentralen Drittel des Lungengewebes. Die durchschnittliche Tumorgröße betrug 1,64 cm (± 0,91 cm). In 84 % der Fälle waren die Läsionen solide, in 4 % sub-solid und in 12 % Ground-Glass-Opacities (GGOs). Zur Verifizierung der Position kam in 68 % der Fälle ein Cone-Beam-CT (CBCT) und in 32 % ein C-Bogen zum Einsatz; in 30 % der Fälle wurde zusätzlich ein radialer endobronchialer Ultraschall (rEBUS) genutzt. Der diagnostische Ertrag (diagnostic yield) betrug unabhängig von der Bildgebung und der histologischen Untersuchungsmethode 78 % und konnte unter Einsatz des CBCT und histologischer Untersuchung an formalinfixierten Präparaten auf >90 % gesteigert werden. Die ersten klinischen Erfahrungen mit dem ION-RNB System in Deutschland zeigen vielversprechende Ergebnisse. Die hohe diagnostische Genauigkeit unterstreicht das Potenzial des Systems für die frühzeitige und präzise Diagnostik peripherer Lungenläsionen. Der Einsatz moderner Bildgebungsverfahren, insbesondere des CBCT, sowie die Auswahl der histopathologischen Untersuchungsmethode stellen maßgebliche Variablen in der Evaluation der patientenzentrierten Behandlungswege dar. Weitere prospektive Studien sind erforderlich, um den langfristigen klinischen Nutzen zu evaluieren.

No conflict of interest.

ID6

Patient-Centred Pathways: Implementierung der ION-Roboter-assistierten Navigations Bronchoskopie (RNB) mit konsekutiver Lungenresektion als „Single Anesthesia Event“

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Die Roboter-assistierte Bronchoskopie mit dem ION-RNB in Kombination mit Cone-Beam-CT (CBCT) und „Tool-in-Lesion“-Verifikation stellt eine bedeutende Innovation in der Diagnostik pulmonaler Rundherde (LRH) in Deutschland dar. Konventionelle bronchoskopische Verfahren stoßen bei peripheren LRH an ihre Grenzen. Die Shape-Sensing Technologie in Kombination mit einem CBCT ermöglicht eine präzisere Steuerung und verbessert die diagnostische Genauigkeit. Eine frühzeitige und verlässlichere Diagnosestellung trägt dazu bei, die Zeit zwischen Erstdiagnose und chirurgischer Therapie zu verkürzen und den Patienten-zentrierten Behandlungsweg zu optimieren. Wir stellen unsere ersten 26 Patienten vor, die mittels ION biopsiert und unmittelbar einer Lungenresektion unterzogen wurden. Wir führten eine retrospektive monozentrische Untersuchung von den 26 thoraxchirurgischen Patienten durch, die in den ersten 6 Monaten der Implementierungsphase mittels ION RNB intraoperativ biopsiert und unmittelbar im Schnellschnitt untersucht wurden. Alle Untersuchungen wurden vom selben Untersucher durchgeführt. Das weitere operative Vorgehen wurde abhängig vom Schnellschnittergebnis festgelegt. Bei den ersten 26 behandelten Patienten, wurden 20 solide Rundherde, 1 subsolider Herd und 5 Ground-Glass-Opacities (GGOs) mit einer mittleren Tumorgröße von 1,72 ± 1,1 cm biopsiert. 34,6 % der Patienten wurden unter Durchleuchtung mit einem C-Bogen biopsiert und 65,4 % mit dem CBCT. Die mittlere RNB-Untersuchungsdauer betrug 62,69 ± 23,28 Minuten. Der diagnostic yield unter Nutzung des CBCT lag bei 85,7 %, bei Verwendung des C-Bogens lediglich bei 22,2 % (p = 0,007). 75 % der Patienten wurden abhängig vom histologischen Ergebnis direkt einer anatomischen Resektion unterzogen. Zur Prozessoptimierung wurden bereits 30,8 % der Patienten ohne Umintubation via Doppellumentubus (DLT) untersucht. Die RNB mit dem ION-System ermöglicht eine verlässliche Diagnostik pulmonaler Rundherde auch im Schnellschnitt. Dieses “Single-Anesthesia-Event" reduziert die Zeitspanne von Diagnostik bis zur definitiven Therapie bei primär operablen Patienten auf ein Minimum. Die Kombination der RNB mit CBCT führte auch hier zu einer höheren diagnostischen Erfolgsrate. Der direkte Einsatz eines DLT verkürzte den Untersuchungsablauf. Zur Validierung dieser Ergebnisse und zur Optimierung des Technologieeinsatzes sind prospektive Studien erforderlich.

No conflict of interest.

ID7

Pure lepidic growth in core needle lung biopsy: a weak basis for surgical decision making

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Among patients with lung adenocarcinoma, those with lepidic precursor lesions such as carcinoma in situ (Tis), minimally invasive adenocarcinoma (MIA) and lepidic-predominant adenocarcinoma (LPA) have an excellent prognosis. This has led to debates about a less radical surgical approach. However, reliable preoperative identification of lepidic tumors is an important prerequisite for deciding on a less aggressive surgical treatment. CT-guided needle biopsy (CTGNB) enables the histological clarification of lung tumors with high sensitivity and specificity. Here, we retrospectively investigated whether CTGNB is suitable for predicting predominance of lepidic growth in lung adenocarcinoma. Methods: All patients who underwent CTGNB followed by anatomical lung resection from 2020 to 2024 were screened in the hospital database. 87 patients with a preoperative diagnosis of pure lepidic growth without signs of invasion were included into this single center retrospective analysis. The study population included 36% male and 64% female patients with a median age of 68 years (IQR 60-73). Surgery was performed as lobectomy (n=48, 55%) or segmentectomy (n=39, 45%), 35 days (IQR 24-45) after lepidic histology had been diagnosed in CTGNB. Final pathology revealed 38 (44%) patients with predominant lepidic lesions (Tis=7, MIA=7, LPA=24), and 49 (56%) of predominant invasive adenocarcinoma (acinar=40, papillary=7, micropapillary=1, solid=1). To evaluate further data with potentially diagnostic value, the relative proportion of ground-glass opacity and solid components in CT was assessed as consolidation-to-tumor ratio (CTR) both uni-dimensionally (1D) and volumetric (3D), showing lower CTR in true lepidic-predominant tumors (1D: 0.5 vs. 0.7, $p = 0.044$ and 3D: 0.1 vs. 0.4, $p = 0.024$, respectively). Treatment decisions for suspected lepidic tumors should currently not be based on a preoperative tissue diagnosis made from CTGNB alone, with a positive predictive value of only 44% in this study population. Our findings highlight the potential to improve diagnostic accuracy by combining data from both histology and imaging by CT and PET/CT, while each technique individually remains a rather weak predictor. Further studies are urgently needed to explore integrative approaches that incorporate data from histology, imaging and molecular analysis.

No conflict of interest.

ID8

Morphological and molecular changes in maturation of spheroids over time

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A problem with the standard cultivation of cells in 2D on artificial surfaces is that it does not accurately reflect the natural situation of cells in tissue. One alternative model is 3D cell culture models (spheroids), which may more accurately reflect the tissue architecture through cell-to-cell contact. In this study, we investigated the morphological and molecular changes during maturation of spheroids made from normal human dermal fibroblasts (NHDF) depending on time and size. Spheroids consisting of 5.000, 10.000 and 50.000 NHDF (3 donors, n=2) were generated by liquid overlay technique (LOT) in a 96-well plate format. A series of photographs (sample-size: 24) was taken at fixed time intervals over the course of a week (day 1: 3 times with a 2-h interval; days 2-4: twice with a 3-h interval, day 7: once) via Cell Imaging Reader BioTek Cytation 1 (Agilent). Diameters of the samples were evaluated via imaging program Fiji/ImageJ. A mathematical formula was established based on the collected data. Gene expressions of β-Actin, Collagen Type 1α1, Vimentin, Tubulin 1α1, α-Smooth Muscle Actin, Lamin A in spheroids of same sizes were investigated on days 2, 4 and 7 (reference: 2D sample from day 0; housekeeping gene: GUSB). RNA was isolated through RNeasy Kit (Qiagen). High-Capacity cDNA Reverse Transcription Kit (Applied Biosystems) was used for transcription. Genes were detected by Taqman™-Assays (Thermo Fisher Scientific). The LOT reliably generated one defined spheroid per well, as reflected by the small standard deviations in data. The relative size of spheroids decreased over time, regardless of cell number. The sharpest decline in size occurred between days 1 and 2. The formula shows an exponential decrease in size over time and is universally valid for all spheroid sizes: f(t)=d/d_norm ×(t/t_norm)^(-0.25). Interestingly the gene expression analysis revealed that all genes were downregulated compared to the 2D reference. Preliminary trends suggest a decrease in β-Actin and Col1a1 expression over time. The cytoskeleton in 2D cultivation is exposed to stronger strains than those in spheroids, where cells are subjected to weaker forces. Alternatively, the cell-size in spheroids reduces over time due to metabolic gradients in 3D structures unlike in 2D cells. Both situations might lead to a downregulation of the genes. To establish a correlation with biomechanics we will continue our investigation through nanoindentation.

No conflict of interest.

ID9

Exploring the Potential of Virtual Reality-Based CT Imaging for Preoperative Planning in Pediatric Congenital Pulmonary Airway Malformation: A Retrospective Analysis

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Modern 3D real-time reconstructions in virtual reality (VR) are increasingly available and have recently demonstrated promising benefits in preoperative planning. Surgical planning for congenital thoracic malformations (CTMs) based on computed tomography (CT) remains challenging, not least due to limited image resolution. This study compares different visualization methods for surgical planning—conventional image viewing versus VR visualization—in terms of their precision and efficiency in this complex clinical context. A retrospective assessment of surgical planning was conducted using anonymized CT scans. The assessments were performed by surgeons of varying experience levels and divided into two groups: conventional 2D grayscale viewing on a standard monitor, and 3D real-time visualization using a VR headset. The study cohort consisted of 14 pediatric patients who underwent thoracic surgery for suspected CPAM at our institution between September 2020 and February 2023. Surgical assessments were compared with intraoperative findings and final pathology reports. A total of 56 assessments were completed. Retrospective simulation of surgical planning showed a diagnostic prediction accuracy of 93% in the VR group compared to 82% in the conventional group, when matched against pathological findings. The prediction of the leading anatomical localization was accurate in 93% of VR cases versus 82% in the conventional group, based on comparison with intraoperative reports. No difference was observed in correctly predicting the surgical procedure, with an accuracy of 43% in both groups. The mean assessment time was 162 seconds for the conventional group and 185 seconds for the VR group, with no statistically significant difference ($p = 0.3523$). The 3D VR-based approach demonstrated comparable clinical value and processing time to conventional CT analysis in pediatric CTM patients. VR visualization showed potential advantages in the assessment of anatomical localization and diagnostic accuracy and warrants further investigation in larger cohorts and across additional thoracic surgical conditions.

No conflict of interest.

ID10

Video-Assisted Thoracoscopic Surgery in Infants and Young Children: Assessing Feasibility and Limitations.

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Intrapleural procedures in infants and toddlers present significant challenges—chief among them the inability to use double-lumen endotracheal tubes due to the small caliber of the tracheobronchial system. As a result, these interventions are often performed via thoracotomy on a ventilated lung. The benefits of video-assisted thoracoscopic surgery (VATS) are well established in adult thoracic surgery and would be highly desirable for younger children as well. Furthermore, thoracotomy at such an early age may lead to long-term sequelae, including spinal and thoracic wall deformities during development. In older children, typically from 4 to 6 years of age, one-lung ventilation is reliably achievable using a bronchial blocker, making VATS feasible. In infants and toddlers, however, careful selection of appropriately sized endoscopic instruments is essential due to limited anatomical space. As part of individualized treatment approaches, the following ventilation strategies were employed to facilitate VATS in selected infants and toddlers: unilateral intubation with a bronchial blocker placed alongside the endotracheal tube, tracheal intubation with a bronchial blocker inserted through the tube, or intrathoracic CO_2 insufflation in patients receiving conventional ventilation. The surgical instrumentation included 2 mm and 3 mm dissection tools, 3 mm and 5 mm endoscopes, 5 mm energy devices, as well as 6 mm linear staplers and hemoclip applicators. By selecting and combining the above techniques, experienced pediatric anesthesiologists were able to successfully establish one-lung ventilation, enabling VATS procedures even in neonates and toddlers. In cases where bronchial blocker placement was not feasible, intrathoracic CO_2 insufflation created sufficient operative space for the use of 2–6 mm instruments. When appropriate surgical instruments are available, the main limiting factor for performing VATS in infants and toddlers is the establishment of one-lung ventilation. This relies heavily on the skillful placement of a bronchial blocker by an experienced pediatric anesthesiologist and, where necessary, the adjunctive use of CO_2 insufflation. Pediatric VATS may help reduce the risk of long-term complications associated with thoracotomy in this vulnerable patient population.

No conflict of interest.

ID12

Generation of prevascularized spheroids for liver tissue engineering by fusion of microvascular fragments with primary hepatocytes

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Spheroids are promising building blocks for scaffold-free tissue engineering in liver regenerative medicine. Their rapid vascularization is of major importance to guarantee their survival after transplantation. To achieve this, we herein introduce the generation of prevascularized spheroids by fusion of adipose tissue-derived microvascular fragments (MVF) with freshly isolated primary hepatocytes (PH). PH and MVF were isolated from donor C57BL/6J mice. For the generation of PH+MVF spheroids, 200 MVF and 2,500 or 5,000 PH were co-cultured in a liquid overlay system for 5 days. PH mono-culture spheroids served as controls. The diameters of the spheroids were assessed by bright-field microscopy from day 1 to day 5. The viability, cellular composition, protein expression and hormone secretion of the spheroids were determined by flow cytometry, immunohistochemistry, Western blot and enzyme-linked immunosorbent assay (ELISA). To investigate the surface topography and angiogenic potential of the spheroids, scanning electron microscopic analyses and sprouting assays were performed. During the generation process, the diameters of all spheroids progressively decreased, resulting in compact spheroids of homogeneous sizes. The incorporation of MVF into PH spheroids did not affect their viability. Of interest, PH+MVF spheroids exhibited a significantly elevated expression (2500 PH: 173,7 ± 10,4 % vs. 100 ± 0 %; 5000 PH: 173,3 ± 5,4 % vs. 100 ± 0 %) and secretion of albumin (2500 PH: 142,4 ± 11,8 ng/ml vs. 43,1 ± 1,6 ng/ml; 5000 PH: 154,1 ± 24,2 ng/ml vs. 49,2 ± 2,6 ng/ml) when compared to PH mono-culture spheroids. All spheroids were characterized by a heterogeneous surface pattern, which was more pronounced in the PH+MVF group. This was most probably due to the mixture of different cell types within these spheroids. Moreover, MVF effectively reassembled into new microvascular networks within the spheroids. Accordingly, these spheroids also showed a high angiogenic sprouting activity in vitro. These findings indicate that PH+MVF spheroids may ideally serve for tissue engineering in liver regenerative medicine due to their increased albumin secretion and high vascularization capacity.

No conflict of interest.

ID13

Impact of 4DryField® PH as a hemostatic agent in Ovarian Surgery on Fertility

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Ovarian cystectomy in reproductive-age women poses the clinical challenge of effectively removing cystic lesions while preserving ovarian reserve and fertility potential. Conventional hemostatic methods, such as bipolar electrocautery, are effective in controlling intraoperative bleeding but are associated with thermal damage, consequently reducing ovarian reserve as measured by Anti-Müllerian Hormone (AMH) levels. 4DryField® PH, a novel plant-derived polysaccharide-based hemostatic agent, claims to offer effective hemostasis without the collateral thermal damage associated with conventional methods. This pilot study evaluates the impact of 4DryField® PH compared to bipolar electrocautery on postoperative AMH levels and thus fertility preservation in ovarian surgery. The study was designed as a prospective, controlled, randomized, single-center, single-blind pilot study at the University Hospital Bonn, Department of Gynecology and Gynecological Oncology. A total of 20 patients were randomized into two groups: 10 patients received hemostasis using 4DryField® PH powder, and 10 patients underwent bipolar electrocautery. Inclusion criteria were ovarian cystectomy, age ≥18 years, and preoperative AMH ≥2.0 µg/l. AMH levels were measured preoperatively and at two postoperative time points (1 day after surgery and 14 days postoperative). Additional secondary endpoints included postoperative complication rates, hemoglobin (Hb), hematocrit (Hk), and inflammatory parameters (CRP, PCT, IL-6, leukocytes). Statistical significance was established at a p-value of <0.05. There were 20 patients who underwent laparoscopic ovarian cystectomy. None of the patients experienced postoperative bleeding. Patients treated with 4DryField® PH demonstrated higher postoperative AMH levels (3.93 µg/l ± 2.87) compared to the electrocautery group (2.75 µg/l ± 1.34 µg/l), although this difference did not reach statistical significance (p=0.364). Inflammatory parameters including CRP (p=0.779), IL-6 (p=0.901), and leukocytes (p=0.678) showed no significant differences between. However, IL-6 was significantly higher on postoperative day 1 in the 4DryField® PH group (50.64 ng/l ± 79.90) compared to the electrocautery group (4.33 ng/l ± 1.78, p=0.016). Lesion size was notably smaller in the 4DryField® PH group (35.1 ± 15.15 mm) compared to the electrocautery group (62.6 ± 48.66 mm), approaching statistical significance (p=0.075). Discussion This pilot study suggests a potential advantage of using 4DryField® PH in preserving ovarian reserve after ovarian surgeries, as indicated by higher postoperative AMH levels, despite statistical insignificance likely due to the small sample size. The significant early postoperative increase in IL-6 in the 4DryField® PH group needs further exploration, although overall safety profiles appeared comparable between both groups. The smaller lesion sizes in the 4DryField® PH group could be reflective of reduced collateral tissue damage, enhancing fertility preservation. 4DryField® PH shows promise in minimizing ovarian reserve loss after cystectomy compared to bipolar electrocautery, with comparable safety profiles.

No conflict of interest.

ID15

Non-invasive biomarker profiling in severe thoracic trauma: diagnostic potential of liquid biopsy

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Thoracic trauma is the third most common injury, occurring in 20-25% of polytraumatized patients. Monocyte-derived extracellular vesicles (sEVs) show promise as serum markers in these patients. This study aims to identify potential liquid biopsy for assessing thoracic injury severity. Forty-five polytraumatized patients with thoracic trauma and ISS>15 were included and categorized into three subgroups based on their injury pattern. sEVs were isolated from blood serum and captured with CD9 on Exoview chips. Expression of CD14 and CD61 was analyzed. Thoracic trauma severity was assessed using the Thoracic Trauma Severity Score (TTSS), RibScore, and AIS chest, along with laboratory analysis and ventilation parameters. The primary endpoint was the development of pulmonary complications, including pneumonia, need for intubation, and tracheostomy for prolonged weaning. Univariable logistic regression and ROC analysis were used for predicting complications. CD9+CD14+sEVs (AUROC 0.81; $p<0.05$, sensitivity 82.3% and specificity 83.3%) emerged as a new serum marker for differentiating the severity of complex thoracic trauma on day 1 post-polytrauma. Significant changes in biomarkers like leukocytes, CRP, PCT, and albumin on day 7 after trauma were associated with the development of pulmonary complications. Preliminary data suggest that CD9+CD14+sEVs is a promising biomarker for detecting severe chest trauma.

No conflict of interest.

ID16

Proteomic and phosphoproteomic analysis of lung adenocarcinoma to differentiate molecular processes between lepidic, acinar and solid growth.

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The histologic subclassification of lung adenocarcinoma (LUAD) includes a lepidic, non-invasive growth pattern; intermediate acinar and papillary patterns; and high-grade solid, micropapillary, and complex glandular patterns. Notably, LUAD is characterized by a heterogeneous and variable growth pattern composition that can profoundly influence biological behavior, therapeutic response, and prognosis. A growing amount of evidence supports the concept of progression from lepidic precursor lesions to lepidic-predominant LUAD and finally to LUAD with a predominant invasive pattern. There is an urgent clinical need to clarify the biological basis for progression toward more aggressive growth patterns and to identify associated biomarkers and potential drug targets. In this study, we first characterized a retrospective cohort of 543 patients with pathologic stage I lung adenocarcinoma who underwent curative-intent resection. We observed pronounced heterogeneity, with 70% of tumors harboring at least three different growth patterns. Survival analysis confirmed the previously described association between high-grade growth patterns and unfavorable survival. To characterize molecular and cellular processes associated with LUAD growth patterns, we recruited 70 patients with corresponding cryotissues from an institutional biobank. We then performed proteomic and phosphoproteomic profiling on samples of lepidic-predominant tumors (n = 32), acinar-predominant tumors (n = 19), and solid-predominant tumors (n = 19). We identified up to 7900 proteins and 20000 phosphorylation sites in each sample (9217 different proteins in total, median 7226, IQR 6761-7639; 43617 different phosphorylation sites in total, median 14309, IQR 12063-15978). Based on their proteomes and phosphoproteomes, we will first explore if tumor proteomic profiles separate according to the predominant growth patterns in Principal Component Analysis (PCA). Planned analyses of differential protein expression, functional pathways, and cell type deconvolution will identify key proteins and biological processes associated with the respective growth patterns. These analyses will also allow us to draw conclusions about tumor progression and invasion. In summary, the characterization of LUAD subtypes using (phospho-)proteomics will improve our understanding of the critical determinants of LUAD heterogeneity and progression, which may inform treatment decisions and new diagnostic approaches.

No conflict of interest.

ID18

Differences in adipose tissue function in obese patients and their influence on postoperative outcomes in bariatric surgery

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Obesity is a global health epidemic leading to numerous serious comorbidities. Bariatric surgery is the most effective treatment, offering significant long-term weight loss and comorbidity resolution. However, a significant proportion of patients achieve less-than-expected benefits due to suboptimal weight loss (SWL) or weight regain (WR). To optimize outcomes and individualize treatment, we aim to identify patients who will benefit more from bariatric surgery. At the molecular level, obesity profoundly alters adipose tissue, causing chronic inflammation, impaired metabolic function, and fibrotic remodeling. These dysfunctions persist in obese patients' pre-adipocytes and mature adipocytes, even in vitro. We hypothesize that metabolically altered and inflamed pre-adipocytes/ adipocytes from obese patients partially retain these traits when isolated and differentiated in vitro, and their browning potential is influenced. The intensity of these characteristics can be correlated with postoperative clinical outcomes, providing insights into bariatric surgery efficacy. In this prospective study, human white adipose tissue (hWAT) samples from subcutaneous (sc) and omental (om) fat depots were collected from bariatric and hernia patients at the University Hospital Bonn. Histological analysis and qPCR of collagen transcript mRNA expression on native tissue assessed fibrotic remodeling. Mature adipocytes (MA) were isolated for inflammatory marker mRNA expression analysis. Stromal vascular fraction (SVF) cells were expanded, differentiated, and assessed for browning potential and baseline mRNA expression properties via qPCR. Our findings reveal significant depot-specific differences in adipocyte characteristics within obese individuals and when compared to lean controls. Subcutaneous adipocytes demonstrated greater beiging capacity than their omental counterparts, suggesting a divergent role in energy metabolism. A positive correlation between collagen expression and BMI underscores the association of increasing adiposity with fibrotic remodeling in hWAT, potentially contributing to adipose tissue dysfunction. Our metabolic and inflammatory analyses suggest a link between altered metabolic signaling, chronic inflammation, and the obese state. These observations emphasize the complex, heterogeneous nature of adipose tissue dysfunction in obesity, potentially contributing to variations in postoperative outcomes following bariatric surgery. Next, individual postoperative outcomes (weight loss, comorbidity amelioration, and postoperative complications) will be correlated with individual adipocyte beiging potential and relevant metabolic/inflammatory markers. This project aims to identify patients who will most benefit from bariatric surgery. Furthermore, resulting data may open novel avenues for modulating adipose tissue thermogenesis, which could be pursued for clinical application against human obesity.

No conflict of interest.

ID19

Prediction of clinical outcome parameters using ex vivo drug sensitivity of personalized tumor slice cultures in pancreatic cancer

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Pancreatic ductal adenocarcinoma (PDAC) exhibits a high mortality rate also due to its immunosuppressive tumor microenvironment (TME), which fosters resistance to chemotherapy. To capture the effect of heterogeneous tissue architecture in PDAC on drug response, we recently refined organotypic slice cultures (OTSCs) as a cultivation system for human PDAC. Ex vivo drug response and clinical outcomes were correlated, specifically survival and predictive biomarkers.Following surgical resection and pathological examination, 25 PDAC specimens were cultured for three to five days. A subset of 15 patients received specific chemotherapy regimens, including gemcitabine (GEM), gemcitabine with nab-paclitaxel (GnP), and FOLFIRINOX (FFX). Using immunohistochemistry (IHC) for markers of proliferation (Ki67), apoptosis (Cleaved Caspase 3), tumor cell count (CK7) and components of the TME (alpha SMA, Sirius red, CD3, CD4, CD8, CD163, CD68), combined with semi-automated quantification via digital image analysis, we first evaluated the ex vivo system's stability over the cultivation period, then determined each patient's ex vivo chemosensitivity using a combined drug sensitivity score. Correlations between ex vivo chemosensitivity, clinical survival, CA 19-9 levels, and GATA6 expression were analyzed. Untreated OTSCs retained structural integrity from day one to day five. Immune cell markers (CD3, CD4, CD8, CD163, CD68) remained stable for at least three days. Among 10 patients whose treatment matched at least one ex vivo tested drug, those classified as ex vivo sensitive showed significantly longer overall survival (median OS 760 vs. 201 days, $p = 0.012$). In the ex vivo sensitive subgroup, the two highest scoring patients survived 757 and 280 days without progressive disease until censorship. Patients with unmatched treatment sorted by GEM, GnP, and FFX showed distinct subgroups, indicating intertumoral heterogeneity in drug response. Patients with CA 19-9 >1000 kU/l had significantly lower ex vivo sensitivity ($p = 0.0002$). GATA6 expression correlated with both longer OS and higher ex vivo sensitivity to FFX and GnP ($r = 0.83$, $p = 0.015$ and ($r = 0.83$, $p = 0.0083$)). OTSCs preserve individual tumor architecture and TME in a rapid, cost-effective ex vivo model, allowing treatment prediction within 8–12 days post-surgery. Correlations with survival, CA 19-9, and GATA6 support OTSCs' potential for translational, personalized PDAC therapy.

No conflict of interest.

ID22

Perioperative imaging visualization using virtual reality in oncological renal surgery.

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Oncological renal surgery requires careful examination of the anatomical relations of the renal mass to critical renal structures, such as the renal vessels, the collecting system and ureter, to enable optimal surgical outcome while preserving as much kidney parenchyma as possible. Virtual Reality, using full 3D patient imaging, shows significant promise in improving the pre-operative planning and patient outcomes, particularly in partial nephrectomies. We conducted a retrospective study, documenting 21 consecutive oncological renal surgery cases from February 2025 to May 2025. The 3D models were shown to three surgeons (either in primary or secondary surgeon role), and a questionnaire based on a 5-point Likert scale was developed to assess the usability and benefits of the 3D visualization using Meta Quest 3 and Meta Quest Pro VR headsets and using Medical Holodeck software. The primary outcome was surgeon satisfaction with using the device, software, and the image visualization quality. The secondary outcome was the non-inferiority regarding patient outcomes in a retrospective comparison to 25 prior cases in a case-control group, comparing perioperative blood loss, change in hemoglobin and creatinine, and post-operative complications using the Clavien-Dindo classification. In 95.5% of all cases, the anatomical presentation was found to be detailed and of high resolution, and the VR integration did not significantly interfere with the clinical workflow. In 91% of the cases, the surgeons agreed that VR allowed a more precise assessment of renal masses compared to conventional 2D CT or MRI imaging and that the combination of 2D and 3D VR imaging led to an additional gain in information. In all cases all participating surgeons reported the VR system to be user-friendly and expressed the intention to continue using VR in the future. In 90,9% the surgeons stated they would recommend the use of VR to their colleagues. For the planning of partial nephrectomies (n=15), in 93,3% of the cases, the surgeons reported that VR facilitated better identification of critical anatomical structures, such as renal vessels. In 80%, VR was more effective in strategizing the surgical approach. In 53,3%, VR was found more helpful than CT or MRI for planning vascular clamping strategies, with selective clamping achieved in 2 of the cases. In 86%, VR was found to be more useful in planning the resection plane. The retrospective baseline comparison between the VR and non-VR groups revealed no statistically significant differences in age, BMI, RENAL score, and tumor size of the populations ($p>0,05$). There were also no significant differences in intraoperative blood loss, surgical duration, arterial clamp duration, postoperative hemoglobin decrease, or postoperative increase in serum creatinine. Overall, the integration of VR is a valuable tool in the pre-operative evaluation and planning of renal surgical cases. Particularly, the full 3D visualization of the anatomical structures helped to improve the topographical orientation and led to high satisfaction. A limitation of the study is the small patient sample size and the retrospective setting. Considering all this, we expect VR to become a standard integrated tool in clinical medicine.

No conflict of interest.

ID23

Die Lernkurve der RATS-Thymektomie: Ergebnisse einer monozentrischen retrospektiven Studie

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Die robotisch-assistierte Thymektomie (RATS) hat sich rasch als bevorzugtes Verfahren gegenüber der offenen transsternalen Technik und der videoassistierten Thorakoskopie bei der operativen Behandlung von Thymomen und nicht-thymomatöser Myasthenia gravis etabliert. Ziel dieser Studie war es, die Lernkurve zweier Chirurgen bei der Anwendung dieser Technik zu analysieren und zu bewerten. Im Zeitraum von Oktober 2018 bis Oktober 2024 wurde eine retrospektive Analyse aller Patienten durchgeführt, die in unserer Klinik einer robotisch-assistierten Thymektomie unterzogen wurden. Zwei Chirurgen führten die Eingriffe eigenständig durch. Insgesamt wurden 48 RATS-Thymektomien durchgeführt. Die histopathologischen Befunde umfassten 18 Thymome, 25 Thymushyperplasien, 2 Thymohämangiolipome sowie je ein Fall eines mediastinalen Seminoms, Thymuskarzinoms und Teratoms. Bei 16 Patienten bestand eine bekannte Myasthenia gravis. Der Chirurg 1 operierte 24 Patienten mit einer medianen Operationszeit von 232 Minuten (109–396 Minuten). Eine Reoperation erfolgte aufgrund eines Rezidivs; Konversionen traten nicht auf. Die durchschnittliche Verweildauer betrug 6 Tage (4–12 Tage). Auch der Chirurg 2 behandelte 24 Patienten. Die mediane Operationszeit lag bei 160 Minuten (50–222 Minuten). In einem Fall war eine Konversion zur Sternotomie notwendig aufgrund einer Infiltration der V. anonima. Der mittlere Krankenhausaufenthalt betrug 5 Tage (4–18 Tage). Ein Vergleich zwischen den ersten 15 und den nachfolgenden Eingriffen zeigte eine signifikante Reduktion der Operationszeit mit zunehmender Erfahrung: Bei Chirurg 1 sank die mediane Zeit von 245 Minuten auf 211 Minuten, bei Chirurg 2 von 177 Minuten auf 135 Minuten. Unsere Ergebnisse deuten darauf hin, dass nach 15 Fällen ein Plateau in der Lernkurve erreicht wird, was auf eine zunehmende Routine und operative Sicherheit hinweist. Die robotisch-assistierte Thymektomie ist auch während der Lernphase ein sicheres und durchführbares Verfahren.

No conflict of interest.

ID24

Eigenschaften und Outcomes bei Patienten mit Lungenkarzinom ohne Raucheranamnese

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Lungenkarzinome zählen weltweit zu den häufigsten krebsbedingten Todesursachen. Das nicht-kleinzellige Lungenkarzinom macht etwa 85 % der Fälle aus – mit einer zunehmenden Inzidenz unter Nicht-Rauchern. Auch der Anteil dieser Patientengruppe, die sich einer chirurgischen Resektion unterzieht, steigt stetig. Ziel dieser Studie war es, klinische Charakteristika und postoperative Verläufe von Nicht-Rauchern mit primärem Lungenkarzinom zu analysieren. Im Zeitraum von Januar 2022 bis Oktober 2024 wurden retrospektiv alle Patient:innen erfasst, die sich in unserer Klinik einer anatomischen Lungenresektion aufgrund eines primären pulmonalen Malignoms unterzogen hatten und anamnestisch als Nie-Raucher klassifiziert wurden. Insgesamt wurden 28 Nie-Raucher operativ behandelt, darunter 9 Männer (Durchschnittsalter: 65 Jahre, Spanne: 24–86) und 19 Frauen (68 %, Durchschnittsalter: 68 Jahre, Spanne: 28–87). Die häufigsten Vorerkrankungen waren arterielle Hypertonie (n = 19) und Diabetes mellitus Typ 2 (n = 3). Die mittlere FEV_1 betrug 2,5 L (91,6 % des Sollwerts, Spanne: 60–125 %). Die häufigste histologische Diagnose war das Adenokarzinom (n = 18; 65 %, davon 60 % Frauen), gefolgt von Plattenepithelkarzinomen (n = 3; 15 %) und typischen Karzinoiden (n = 7; 25 %). Zwei Patient:innen erhielten aufgrund mediastinaler Lymphknotenmetastasen bzw. oligometastatischer Erkrankung eine systemische Vorbehandlung (neoadjuvant/präoperativ). In sieben Fällen erfolgte eine anatomische Segmentresektion, in 21 Fällen eine Lobektomie. Der Großteil der Eingriffe wurde minimal-invasiv durchgeführt (n = 21; 75 %; davon 16 VATS, 5 RATS), während 7 Patient:innen primär über Thorakotomie operiert wurden. Es traten keine schwerwiegenden postoperativen Komplikationen auf. Die durchschnittliche stationäre Verweildauer lag bei 6 Tagen. Die Tumorstadienverteilung gemäß UICC 8 war wie folgt: Stadium I (n = 19; 68 %: 4 IA1, 7 IA2, 4 IA3, 4 IB), Stadium II (n = 4; 14 %: 1 IIA, 3 IIB), Stadium III (n = 4; 14 %: 3 IIIA, 1 IIIB) und Stadium IVA (n = 1). Die Mehrheit der operierten Nie-Raucher mit primärem Lungenkarzinom in unserer Kohorte waren Frauen unter 70 Jahren mit einem Adenokarzinom im Frühstadium. Die postoperativen Verläufe waren komplikationsfrei, was vermutlich auf den guten präoperativen Allgemeinzustand – insbesondere die erhaltene Lungenfunktion und geringe Komorbiditätslast – zurückzuführen ist. Um dieses zunehmend relevante Patientenkollektiv besser zu charakterisieren, sind prospektive Studien notwendig.

No conflict of interest.

ID25

Somatostatin (SST) is a crucial factor for the development of the pancreatic islet vascular network

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Somatostatin (SST) released from pancreatic delta-cells is known to modulate insulin and glucagon secretion. Recently, it has been reported that this hormone can enhance the angiogenic potential of vascular endothelial growth factor (VEGF)-A by priming endothelial cells. Therefore, we hypothesize, that SST released from pancreatic delta-cells is a crucial factor in developing the islet vascular network. We first analyzed the endocrine and vascular composition of islets within the pancreas of wild type (WT) and SST-/- mice by immunohistochemistry. Moreover, we dispersed isolated islets from WT and SST-/- mice and fused them with microvascular fragments (MVF) from WT mice to generate pseudoislets (PI), which were subsequently used for spheroid sprouting analyses. To study the angiogenic potential of WT and SST-/- islets in vivo, we used the murine dorsal skinfold chamber model and kidney capsule model in diabetic mice. To elucidate the underlying mechanism of SST on vascular cells, we investigated the angiogenic pathways Akt and extra cellular-signal regulated kinase (ERK) in human umbilical vein endothelial cells (HUVEC) and human placental pericytes (hPC-PL) by Western blot. The effect of SST on vascular cell migration, proliferation and angiogenic activity was further assessed by means of scratch-, WST- and tube formation assays. We found a markedly reduced number of alpha-smooth muscle cells (SMA) in islets of pancreatic sections from SST-/- when compared to WT controls. Transplanted SST-/- islets exhibited a lower functional capillary density resulting in a lower take rate. Furthermore, the transplantation of SST deficient islets into diabetic recipient mice led to higher blood glucose levels when compared to transplanted WT controls. Spheroid sprouting assays revealed that the loss of SST decreases the outgrowth of small blood vessels from PI into the surrounding collagen matrix. The analyses of the underlying mechanism demonstrated that physiological low doses of SST induces Akt signaling in HUVEC and hPC-PL resulting in enhanced cell proliferation and angiogenic activity. In the present study, we identified a novel function of SST released from pancreatic delta-cells. We found that SST promotes angiogenic processes within pancreatic islets and, thus is crucial for the development of the islet vascular network.

No conflict of interest.

ID26

Hochregulation von Proteinen, die mit alternativem Splicing und dem Androgensignalweg zusammenhängen, in MET-amplifizierten Adenokarzinomen des Ösophag

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Das Adenokarzinom des Ösophagus ist eine Tumorentität mit steigender Inzidenz und hoher Mortalität. Die Amplifikation des Protoonkogens MET tritt in dieser Entität auf und ist mit einem schlechterem Patientenüberleben assoziiert. Dennoch ist das Ansprechen auf die Therapie mit MET-Inhibitoren limitiert. Ziel dieser Studie ist es, mögliche zusätzliche Therapieziele in MET-amplifizierten Adenokarzinomen des Ösophagus zu finden. Hierfür wurden Adenokarzinome des Ösophagus von 900 Patienten auf das Vorliegen einer MET-Amplifikation mittels Fluoreszenz-in-situ-Hybridisierung untersucht. Zur weiteren Untersuchung wurden 20 MET-amplifizierte und 39 nicht amplifizierte Tumore zufällig ausgewählt und das Proteom mittels Flüssigchromatographie mit Massenspektrometrie-Kopplung (LC-MS) bestimmt. Zur Identifizierung von Proteinclustern wurde der Markov Cluster Algorithmus angewendet. Um die vorhandenen Immunzellen näher zu bestimmen, wurden immunhistochemische Färbungen von etablierten Zellmarkern durchgeführt. Es zeigten sich 81 hoch- oder runterregulierte Proteine in MET-amplifizierten Adenokarzinomen des Ösophagus, unter anderem eine Runterregulation von Hornerin. Mithilfe eines Protein-Protein-Interaktionsnetzwerkes konnten wir 26 Proteincluster identifizieren, die signifikant anders exprimiert sind. Unter Miteinbezug von Überlebensdaten konnten wir einen bestimmten Phänotyp definieren, der in einem Großteil der MET-amplifizierten Tumoren vorhanden ist. Ebendieser zeigt eine höhere Expression von Proteinen, die mit alternativem Splicing und dem Androgensignalweg verbunden werden. Zusätzlich ist dieser Phänotyp mit einem schlechteren Patientenüberleben assoziiert. Die zusätzliche Untersuchung des inflammatorischen Tumormicroenvironmentes zeigte, dass das vermehrte Vorhandensein von M2 Makrophagen in MET-amplifizierten Tumoren mit einem schlechteren Gesamtüberleben assoziiert ist. In diesem Projekt konnten sowohl anders exprimierte Proteine sowie Proteincluster im Met-amplifizierten Adenokarzinom des Ösophagus beschrieben werden. Hier konnte eine Hochregulation von Proteinen, die mit alternativem Splicing und dem Androgensignalweg zusammenhängen, festgestellt werden. Diese neue Verbindung sollte dazu führen, dass Inhibitoren des Androgensignalweges als zusätzliche antitumorale Therapieoption für Patienten mit MET-amplifizierten Adenokarzinomen des Ösophagus in präklinischen und klinischen Studien evaluiert werden.

No conflict of interest.

ID27

A metabolic test to tell marginal from poor quality liver grafts during machine perfusion

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Evaluative measures, helping to decide whether a marginal graft can be used for transplantation or rather be discarded are of utmost importance but yet basically underdeveloped. Recent technical developments allow for the isolated detection of 13C-labeled carbon dioxide in the oxygenator exhaust of an isolated perfused organ. By adding a 13C-labelled substance to the perfusate, its metabolism can be monitored by measuring the increase in 13C carbon in the exhaust air1. In the present study this method was investigated for its potential to differentiate between marginal or poor pig livers during machine perfusion and compared to the use of conventional parameters or biomarkers. Porcine livers were subjected to 0, 20 or 45 min of warm ischemia (representing healthy, marginal and poor grafts) and cold stored overnight. Evaluative perfusion was done with MPS at 20°C for 3h. After 30 min of equilibration, 13C acetate was injected and its metabolization by the citrate cycle quantified by direct detection of 13CO2 at the oxygenator. Not surprisingly, all conventional parameters (e.g. flow, bile, transaminases, lactate) showed clear differences between healthy and poor livers but no differences were disclosed between marginal and poor livers (flow 1133±298 vs 999±225 ml/min, lactate 1.2±0.7 vs 1.2±0.3 mmol/l, bile 0.4±0.2 vs 0.6±0.5 µl/g/h, AST 591±552 vs 815±339 U/l; mean±SD; n=6, resp.). Only the acetate turnover differed between marginal (41.1±14.9) and poor grafts (20.5±9.9 µmol/30min; p=0.019) and could thus help to recognize usable livers out of the pool of suboptimal grafts. ROC curve analysis for discrimination of marginal vs poor grafts by acetate turnover revealed an area under the curve of 0.89. Thus, the 13C turnover test appears to have the potential of an objective, quantitative and valuable adjunct in the toolbox for pre-transplant evaluation of questionable liver grafts.

No conflict of interest.

ID28

Elevated BMP-9 expression predicts better prognosis in colorectal cancer (CRC)

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BMP-9 is a secreted cytokine belonging to the TGF-β superfamily and circulating with the blood stream of healthy individuals in a constitutive fashion. We previously showed that in addition to the liver, BMP-9 is also locally expressed in the small intestine and by upregulating ID1 expression, it seems to have protective functions in the setting of colorectal cancer (CRC). We therefore further investigated the mechanism(s) of such potentially protective effects of BMP-9. By in silico data analyses (TNMplot), we found that in colon cancer tissue BMP-9 expression is often reduced compared to the surrounding normal mucosa. Furthermore, low BMP-9 expression in CRC patient samples was associated with poorer survival outcomes, indicating again that BMP-9 might have protective effects. In mice low but clearly detectable expression of BMP-9 was found in all segments of the intestinal tract (stomach, duodenum, jejunum, ileum, colon) at comparable levels. ALK1, the high affinity BMP-9 receptor, was higher expressed at both "ends" (stomach/duodenum and colon) and this was even more prominent for the LPS receptor TLR4. We previously showed that LPS can down-regulate BMP-9 expression in vitro and this might explain why cancers in stomach or colon develop more often than in the small intestine (jejunum and ileum): LPS would down-regulate local BMP-9 via TLR4 signalling leading to a more vulnerable mucosa with low ID1 expression. In the high-fat diet (HFD) feeding model in mice the liver-to-body weight ratio gets significantly increased. Interestingly, we found that this is accompanied by enhanced hepatic BMP-9 expression and elevated BMP-9 serum levels. In parallel HFD feeding led to an increase in serum cholesterol. This prompted us to measure BMP-9 and cholesterol in a set of human serum samples and we found that both are significantly positively correlated. Furthermore, in human colon organoids BMP-9 stimulation upregulated the expression of the cholesterol/LDL binding receptor LDLR. These data imply that BMP-9, by upregulating LDLR might further act protective in the intestinal tract by promoting clearance of diet-induced cholesterol from the circulation. We conclude that BMP-9 acts protective against intestinal cancer development via (at least) two mechanisms: up-regulation of ID1 (which was shown to be associated with better survival times) and dampening the locally damaging effects of diet-induced cholesterol accumulation by mediating its uptake into the cells.

No conflict of interest.

ID29

Sechs Jahre TraumaEvidence – Projektupdate

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Das Projekt TraumaEvidence wurde vor 6 Jahren von der Deutschen Gesellschaft für Unfallchirurgie (DGU) und dem Universitätsklinikum Düsseldorf gegründet, um die Evidenz in der Orthopädie und Unfallchirurgie (O und U) zu fördern. Welche Ziele hat das Projekt erreicht und wie hat es sich verändert? Ein Schwerpunkt ist die Durchführung von Systematic Reviews, die in interdisziplinärer Zusammenarbeit von Methodiker:innen und Kliniker:innen sowie wenn möglich in Kooperation mit z.B. einer Sektion der DGU/DGOU erstellt werden. Die Verbreitung von methodischem Wissen wird vor allem durch die Betreuung von Doktorand:innen erreicht. Neben Publikationen und Kongressbeiträgen werden Studienresultate im TraumaEvidence Newsletter verbreitet. Im Letzteren werden Resultate von Systematic Reviews aus der O und U vorgestellt und kritisch kommentiert. Innerhalb der ersten 6 Jahre hat sich TraumaEvidence breit vernetzt und ist aus der O und U nicht mehr wegzudenken. Insgesamt profitieren derzeit 10 Doktorand:innen von der im Projekt gesammelten Expertise (3 weitere Doktorandinnen haben bereits abgeschlossen). Die am Projekt mitwirkenden Kliniker:innen haben gemeinsam mit den Methodiker:innen Systematic Reviews erstellt und ihre klinische Expertise z.B. im Newsletter zur Verfügung gestellt. Bis dato konnten 12 Artikel publiziert werden. Häufig entstehen diese Arbeiten unter der Einbeziehung von DGU/DGOU Sektionen wie der Sektion Becken- und Acetabulumsverletzungen. Darüber hinaus ist das Projekt aktiv auf Kongressen in der O und U und EbM mit Abstracts und eingeladenen Vorträgen vertreten. Es zeigt sich ein jährlich ansteigender Trend. Im Mai 2025 erschien die 54. Ausgabe des TraumaEvidence Newsletters. Insgesamt wurden seit Beginn knapp 210 Systematic Reviews zusammengefasst und kritisch kommentiert. Damit diese Zusammenfassungen nachhaltig verfügbar und nutzbar sind, werden diese seit Oktober 2022 auf der Evidence2Go Datenbank gespeichert und Kliniker:innen frei zur Verfügung gestellt. TraumaEvidence fördert die EbM in der O und U umfangreich. Das Projekt hat mit der Unterstützung aller Akteur:innen innerhalb von 6 Jahren Strukturen geschaffen, die interdisziplinäres wissenschaftliches Arbeiten mit einer effizienten und qualitativ hochwertigen Herangehensweise in den Fokus stellt. Damit kann das Projekt aus der O und U in die O und U wirken.

No conflict of interest.

ID30

Intestinal Failure in Germany: Current estimate of prevalence, medical care situation and patient characterization – Update 2025

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The exact prevalence of intestinal failure (IF) in Germany is unknown. Twelve years ago, our survey revealed a prevalence of 34 patients per million population. Recent medical advances, particularly in pediatric care, may have improved survival rates for IF patients. Additionally, the increase in bariatric surgery and other procedures may lead to more surgical complications, potentially increasing IF prevalence. We hypothesize that the prevalence of IF in Germany has increased over the last decade. The study followed the same methodology as its predecessor, using a rare diseases prevalence estimation method [Wakai et al., 1997; von Websky et al., 2013]. A questionnaire was sent to 445 hospitals to gather data on the number of current IF patients and the availability of medical information on IF. The survey also classified patients according to the ESPEN guideline for IF [Pironi et al., 2023]. Data collection will be completed by Q2/2025, after which the prevalence estimate for Germany will be updated, focusing on changes over the past decade. Although the exact prevalence of intestinal failure in Germany remains unknown due to the lack of a mandatory IF registry, our estimate provides the best available option for assessing IF prevalence and patient care in Germany.

No conflict of interest.

ID31

Genetically modified mouse models of gastric cancer closely resemble the tumor micro-environment of their human counterparts and exhibit resistance to immune checkpoint inhibition

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Immune checkpoint inhibition (CKI) using monoclonal antibodies demonstrated remarkable efficacy in several types of cancer. However, response rates to anti-PD-1 treatment in patients with esoph-agogastric adenocarcinoma (EGA) are low and the majority patients do not benefit from CKI. Rep-resentative preclinical models are crucial for bed- to benchside approaches to overcome mecha-nisms of CKI resistance. We used two genetically modified mouse models, which express a tamoxi-fen-inducible Cre-recombinase in the stomach-specific Anxa10 locus and which genetically repre-sent the genomically stable (GS; Cdh1fl/fl, KrasG12D/+ and Smad4fl/fl) and chromosomal instability (CIN; Tp53R172H, KrasG12D/+ and Smad4fl/fl) subtypes of EGA according to the TCGA classification. The CIN model showed a rapid, intestinal tumor growth as observed by magnetic resonance imaging, and a highly activated T and B-cell response in flow cytometry analyses of different lymphocytic organs. The GS model demonstrated a slow progressing tumor growth with T and B cells being less differ-entiated and activated. Tumor growth was accompanied by development of metastases in liver, lymph nodes and lungs, development of tertiary-lymphoid structures and infiltration by T cells. A direct comparison of activation and localization of T and B-cell subsets between the two mouse models and samples from EGA patients revealed high similarities. Moreover, we analyzed local and systemic effects of anti-PD-1 and 4-1BB treatment as monotherapies and in combination in early, advanced and metastatic stages of the two mouse models. We observed only minor effects of this treatments and, in accordance with the human disease, a high resistance to CKI. Taken together, the here described mouse models of EGA offer a unique opportunity to study the role of TLS in the anti-tumor immune response and to develop new therapeutic options to overcome CKI resistance.

No conflict of interest.

ID32

Influence of short-chain fatty acids on VE-cadherin phosphorylation and alignment of human aortic endothelial cells under shear stress

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Hemodynamic forces are sensed at cellular junctions by mechanosensitive proteins like AmotL2 or LGN. These proteins interact with VE-cadherin in a phosphorylation-dependent manner, ensuring proper alignment of the cell along the flow axis. Impaired sensing of flow causes incorrect alignment and a disturbed integrity of the endothelial cell layer which is suggested to contribute to aortic inflammation. Previous results show that gut microbiota-derived short-chain fatty acids such as butyrate, in addition to their known anti-inflammatory properties, also influence the phosphorylation of VE-cadherin and endothelial integrity. It remains to be clarified if this also occurs under laminar flow conditions. Here we address this subject by investigating the impact of butyrate and propionate on VE-cadherin phosphorylation and its interaction with AmotL2 under laminar flow conditions. Human aortic endothelial cells were cultured under static conditions or exposed to laminar shear stress at 4 dyn/cm^2 or 10 dyn/cm^2 in the presence or absence of butyrate and propionate. The level of VE-cadherin phosphorylation as well and the binding of AmotL2 to VE-cadherin were analyzed by Western blotting and co-immunoprecipitation. Cell alignment and polarization relative to the flow direction in the presence or absence of butyrate were assessed by phase contrast and fluorescence microscopy detecting the Golgi marker GM-130. Butyrate elevated shear stress dependent phosphorylation of tyrosine 658 of VE-cadherin, most significantly at 10 dyn /cm^2. In the presence of butyrate, AmotL2 protein level were slightly increased. Elevated AmotL2 did not increase the VE-cadherin-bound fraction of AmotL2. Instead, butyrate rather interfered with the binding of AmotL2 to VE-cadherin. Interestingly, preliminary data indicate that propionate also impaired the binding of AmotL2 to VE-cadherin. Moreover, butyrate treatment reduced the number of aligned and polarized cells, most significantly at 4 dyn/cm^2 compared to 10 dyn/cm^2. Conclusion: Given their known anti-inflammatory effects, we speculate that butyrate and propionate may have an ambivalent role, impairing cell alignment and potentially disrupting mechanosensing, which could trigger inflammation. Ongoing experiments aim to confirm these findings and clarify the role of SCFAs in mechanosensing.

No conflict of interest.

ID33

Impact of Proximal Humeral Fractures on Care Level in older Patients – A Propensity Score Matching Analysis of Surgical vs. Non-Operative Treatment

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Proximal humeral fractures (PHFs) frequently affect older adults and can significantly impact their independence and need for care, yet systematic studies on this impact are lacking. This study aims to analyze how PHFs influence the level of care (LoC) and examines differences in outcomes based on treatment methods. All patients (age above 65 years) with an in- or outpatient coded PHF (ICD S42.2) between 01/2017 and 09/2022 were included to the study. Treatment allocation was performed during the first 21 days after fracture and patients with shorter follow-up time were excluded. They received either non-operative treatment or surgical options such as locked plate fixation (LPF) or reverse total shoulder arthroplasty (RTSA). A 1:1 propensity score matching adjusted for age, sex, pre-existing LoC, fracture year, and risk profile was performed, including N=31,314 patients in the analysis set. The primary endpoints examined were overall survival, worsening of care level, and the need for nursing home care (NHC), using Aalen-Johansen estimates and a Fine and Gray Cox regression model. Among 54,595 patients (median age 79 years, 84% female), 44.3% underwent surgery (LPF 36,8%, RTSA 32.2%, 29.0% other/unclear). Surgically treated patients had lower pre-existing LoC. One year after PHF, 21.3% of patients required increased LoC compared to pre-fracture levels. Those treated with RTSA showed a significantly higher risk for increased LoC compared to non-operative patients. However, no difference emerged in cases reaching severe care needs (Level III or higher). Among patients living independently before their fracture, 11% transitioned to nursing home care within a year. There was no significant difference in nursing home admission rates between surgical and non-operative treatments. PHFs considerably affect the independence and care requirements of older patients, illustrating the need for individualized, risk-adjusted treatment strategies. Patient-individualized PHF treatment can improve patients' life quality and might reduce the financial strain on healthcare systems. This study is pioneering in systematically documenting the care level changes following PHFs, emphasizing the importance of refined treatment approaches for the older patients.

Conflict of interest:

JK, JSS and JCK report research funding from the German Society for Trauma Surgery sponsored by Stryker, outside of the submitted work.

ID34

Mitochondrial Dysfunction in Neutrophils from Trauma Patients with Type 2 Diabetes

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Type 2 Diabetes Mellitus (T2DM) is associated with impaired fracture healing and increased risk of chronic wounds, partly due to dysregulated neutrophil activity. As first responders, neutrophils contribute to pathogen clearance and inflammation control through mechanisms such as neutrophil extracellular traps (NETs). In T2DM, excessive NET formation was observed to prolong the inflammatory phase and delay tissue repair. Although neutrophils primarily rely on glycolysis, mitochondria play a crucial role in regulating NETosis, apoptosis, and immune signaling via mitochondrial ROS (mtROS). Disrupted mitochondrial function in T2DM may alter neutrophil behavior, highlighting a potential link to poor healing outcomes and a novel therapeutic target. To investigate this, neutrophils were isolated from healthy donors, trauma patients, and trauma patients with T2DM. Mitochondrial membrane potential (ΔΨm) was measured using JC-1 staining. Gene expression of mitochondrial complexes (ND6, SDHA, CYB, COX2, ATP6) was assessed via qRT-PCR. Mitochondrial DNA (mtDNA) in NETs was quantified using qPCR, and mtROS production was analyzed by flow cytometry with the mitoSOX probe. The role of ΔΨm in NETosis was evaluated with the Sytox Green Assay following stimulation with PMA, CI, or CCCP (a ΔΨm uncoupler). Results showed that both trauma and T2DM groups exhibited severely disrupted ΔΨm, comparable to CCCP-treated cells. Genes associated with mitochondrial complexes II–V were over twofold downregulated in both patient groups. Patients also showed a trend toward reduced mtDNA release into NETs, although mtROS levels were unchanged. Notably, CCCP treatment increased spontaneous NET release. However, it reduced PMA-induced NETosis while enhancing NET release in CI-stimulated cells. In conclusion, trauma and T2DM are associated with significant mitochondrial dysfunction in neutrophils, which may impair immune regulation and tissue repair, identifying mitochondria as a potential therapeutic target in diabetic and trauma-related healing deficits.

No conflict of interest.

ID35

Anwendung von Vision-language models (VLMs) bei der automatischen Erkennung von Knochentumoren auf Röntgenbildern

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Vision-Language-Modelle (VLMs) wie ChatGPT verfügen seit Kurzem über Bildverarbeitungsfähigkeiten. Ihr Potenzial zur Analyse orthopädischer Röntgenbilder, insbesondere bei der Detektion und Klassifikation von Knochentumoren, wurde bisher nicht untersucht. Ziel dieser Studie war es, die diagnostische Leistungsfähigkeit verschiedener VLMs ausschließlich auf Basis visueller Informationen zu bewerten. Es wurde ein balanciertes Datenset mit 60 Röntgenbildern erstellt, jeweils 20 aus den Kategorien „kein Tumor", „benigner Tumor" und „maligner Tumor". Die Stichprobe war geschlechts- und zentrumsbalanciert sowie vielfältig hinsichtlich anatomischer Perspektiven (frontal, lateral, schräg). Eine automatisierte Pipeline analysierte die Bilder mithilfe von API-basierten VLMs, strukturierten Prompts und validiertem JSON-Output. Vier Modelle (Gemini 2.5 Pro, Gemini 2.5 Flash, GPT-4.1, MedGemma 4B) wurden auf sieben Klassifikationsaufgaben getestet. Die Bewertung erfolgte mittels feldspezifischer Genauigkeit sowie mikro-gemittelter Gesamtmetriken (Accuracy, Recall, F1-Score). Gemini 2.5 Pro erreichte die höchste Gesamtgenauigkeit (76 %) und zeigte besonders gute Leistungen bei der Erkennung der Körperregion (95 %), Tumorpräsenz (88,3 %) und Malignität (85 %). GPT-4.1 zeigte mit 63,1 % die niedrigste Gesamtgenauigkeit, insbesondere bei der Tumortypklassifikation (18,3 %). MedGemma 4B erzielte eine Gesamtgenauigkeit von 62,1 % bei einem Recall von 59,5 % und F1-Score von 60,8 %. Stärken zeigten sich bei der Erkennung von Körperteilen (93,3 %) und Tumorpräsenz (78,3 %), jedoch war die Genauigkeit bei Tumortypen (26,7 %) sowie Aufnahmewinkel (43,3 %) deutlich geringer. Fazit: VLMs zeigen bereits vielversprechende Ergebnisse bei der automatisierten Analyse orthopädischer Röntgenbilder. Während grundlegende Klassifikationen gut funktionieren, bestehen bei komplexeren Aufgaben wie der Tumortypdifferenzierung deutlicher Verbesserungsbedarf – insbesondere bei MedGemma 4B und GPT-4.1. Weiterführende Modellanpassungen und Trainingsdatenoptimierungen sind erforderlich, bevor ein klinischer Einsatz realistisch erscheint.

No conflict of interest.

ID36

Molecular evaluation of the impact of the antineoplastic substance Misetionamide on the cMYC pathway in pancreatic cancer: an in vitro study

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Pancreatic cancer exhibits the lowest survival rate among all malignancies worldwide and ranks as the fourth leading cause of cancer-related mortality in Germany. Currently, the only potentially curative treatment consists of complete surgical resection followed by adjuvant chemotherapy. Combination chemotherapy regimens, such as FOLFIRINOX (5-FU, iri, oxa) or gem/ nab-pac, are restricted to patients with adequate performance status due to their substantial toxicity profiles. Moreover, the development of therapeutic resistance frequently leads to tumor relapse, representing a significant clinical challenge. Misetionamide (MIS), also known as GP-2250, is an oxathiazinane derivative that, in combination with gemcitabine, has demonstrated promising antineoplastic efficacy in a xenograft mouse model of pancreatic ductal adenocarcinoma (PDAC). This combination exhibited a favorable safety profile with reduced adverse effects and diminished emergence of secondary resistance. Mechanistically, MIS exerts its effects through inhibition of glucose metabolism and suppression of NF-κB signaling pathway. MYC is a proto-oncogene which is upregulated in most human cancers. It plays a pivotal role in cellular growth and proliferation. It promotes the expression of genes, which drive the energy metabolism, synthesis of proteins, lipids and nucleotides and cell cycle progression thereby contributing to oncogenesis. In pancreatic cancer, MYC is frequently overexpressed, resulting in uncontrolled cellular proliferation and tumor progression. Recent studies have demonstrated that MYC amplification correlates with poor prognosis and aggressive tumor phenotypes in patients with PDAC. Consequently, targeting MYC signaling pathways has emerged as a promising therapeutic strategy for this malignancy. Therefore, the aim was to investigate the effects of MIS on the role of the transcription factor cMYC in an in vitro model system of PDAC using established and primary PDAC cell lines. The study aimed at the potential impact of MIS on the function of cMYC, in particular, on changes in the level of expression of cMYC, the rate of proteasomal degradation using the proteasome inhibitor MG132, the extent of DNA binding using a Kit for Transcriptional Activity (Abcam) and the implementation of downstream target genes of cMYC such as Cyclin D1 and D2. The results of this study will contribute to better understanding of the molecular mechanism of MIS in controlling PDAC.

Conflict of interest:

Britta Majchrzak-Stiller is emloyee of the Sankt-Josef Hospital, Department of general and Visceral Surgery which received the substance Misetionamide and research fundings for disposables for the study from Geistlich Pharma. Geistlich had no role in the design of the study, collection, analysis or interpretation of the data.

ID37

Establishment of Patient-Derived PDAC Organoids and the Investigation of the Influence of Niche Factors on Tumor Subtype Classification and Therapeutic Response: study design and preliminary data

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Pancreatic ductal adenocarcinoma (PDAC) represents the most common malignant neoplasm of the pancreas and is currently the fourth leading cause of cancer-related mortality in Germany. Due to typically late-stage diagnosis, curative surgical resection is rarely feasible, placing the therapeutic emphasis on systemic chemotherapy. Recent studies utilize patient-derived organoids (PDOs) to assess individual drug responses aiming to identify the most effective therapeutic regimen and to reduce unnecessary toxicity. On the molecular level, PDAC can be divided into two transcriptional subtypes: the classical subtype, characterized by well-differentiated cells and a favorable prognosis, and the basal-like subtype, marked by poorly differentiated, solid tumor architecture and worse clinical outcome. Increasing evidence suggests that tumor microenvironmental niche factors influence PDAC cellular differentiation and therapeutic vulnerability. However, it remains unclear whether a mismatch between the PDO subtype and the corresponding primary tumor subtype impairs the predictive accuracy of drug response profiling. This study aims to modulate the conditions in the WNT+ PDO culture medium to investigate the impact of niche signals on subtype fidelity and drug response. Modifications include the omission of WNT pathway agonists, the addition of transforming growth factor-β (TGF-β) to induce basal-like features, and supplementation with R-Spondin3 or co-culture with cancer-associated fibroblasts (CAFs) to promote the classical subtype. For each condition, pharmacotyping will be performed using standard chemotherapeutics (gemcitabine, nab-paclitaxel, 5-fluorouracil, irinotecan, and oxaliplatin) to evaluate differential treatment responses. Subtype classification will be conducted on both primary tumor and matched PDOs via histopathological analysis, immunohistochemistry, and quantitative real-time PCR (qRT-PCR) for the established subtype markers GATA6 and HNF1A (classical) and KRT17 and p63 (basal). CAFs will be isolated from PDAC tissue using the outgrowth method, followed by characterization based on spindle-shaped morphology and immunofluorescence for the absence of E-cadherin and the expression of vimentin and α-smooth muscle actin (α-SMA). This work aims to determine whether modulating niche-derived signals can resolve subtype discrepancies between PDOs and the primary tumor and whether such alignment improves the predictive validity of PDO-based therapeutic screening.

No conflict of interest.

ID40

Patient-Specific Pharmacogenomics unveils xCT as a Key Regulator for Druggable Metabolic and Proliferation Pathways in Colon Cancer

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Colorectal cancer (CRC) represents the third-leading cause of cancer-related deaths. Knowledge covering diverse cellular and molecular data from individual patients has become valuable for diagnosis, prognosis, and treatment selection. Here, we present an in-depth comparative mRNA-seq and microRNA-seq analysis of tissue samples from 32 CRC, pairing tumors with adjacent healthy tissues. The differential expression gene (DEG) analysis revealed an interconnection between nutrients, metabolic programs, and cell cycle pathways. We focused on the impact of overexpressed SLC7A11 (xCT) and SLC3A2 genes which compose the cystine/glutamate transporter (Xc-) system. To assess the oncogenic potency of the Xc-system in a cellular setting, we applied a knowledge-based approach for analyzing gene perturbations from CRISPR screens across various cell types as well as using a variety of functional assays in five primary patient-derived organoid cell models to functionally verify our hypothesis. We identified a previously undescribed cell surface protein signature predicting chemotherapy resistance and further highlighted the causality and potential of pharmacological blockage of ferroptosis as promising avenue for cancer therapy. Biological processes such as redox homeostasis, ion/amino acid transporters and de novo nucleotide synthesis were associated with these co-dependent genes in patient specimens. This study highlighted a number of overlooked genes as potential clinical targets for CRC and promotes stem cell-based, patient-individual in vitro model systems as a versatile partner platform to functionally validate in silico predictions, with focus on SLC7A11 and its associated genes in tumorigenesis.

No conflict of interest.

ID41

Influence of different distraction regimes on femoral bone regeneration in a rat model

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Huge bone defects are a major problem in orthopedic and trauma surgery. The “gold standard” in clinics for such defects is the callus distraction with a rate of 1 mm/day. This can be very time consuming and increases the risks for complications, as infections. Therefore, it is necessary to further investigate effects of different distraction rates on bone regeneration. The aim of the project was the comparison of two new distraction regimes with the standard. 12 weeks old, male Brown Norway rats received an osteotomy of the diaphyseal femoral bone fixed by an external distraction fixator. Seven days after operation, the animals were subdivided into three regimens with distraction over 12 days and a total elongation of 9 mm. Group 1 represented the clinical standard with constant distraction of 0.75 mm/day and therefore served as control. In group 2, the first six days distraction was “fast” (1 mm/day) and another six days “slow” (0.5 mm/day). In group 3, the “fast” and “slow” distraction rates were inverted. Sacrifice was performed 14, 20, 33 and 47 days after operation. The distracted regenerates were analyzed with µCT, X-ray, and DXA to determine several bone morphometric parameters. Next, the bones will be analyzed on histological, RNA and protein level. In all three groups, implantation and osteotomy led to an average weight loss of 3.2%. Until the end of the latency phase, the weight almost returned to baseline values, with no changes during the distraction phase. During consolidation phase, the animals gained on average 7.5 % of weight. Pin dislocations occurred in 25% of cases. In the clinical standard group dislocations were most common with 11.6%, compared to group 2 (7.2%) and group 3 (6.6%). Examination of bone morphometric parameters showed that both new regimens were as good as the clinical standard. Moreover, in group 3 the relative volume of complete callus with 27.9±6.3% and soft callus with 16.4%±4.2% were significantly increased on day 33 compared to group 1 (complete callus: 18.9±6.3%; p=0.0149; soft callus: 10.6%±4.2%; p=0.0204). Neither µCT scans nor BMD measurements revealed any inferiority of the new distraction regimens compared to the clinical standard, which was supported by X-ray scorings. Radiologically, the new regimens showed equally good results as the clinical standard, meaning that histological and molecular analyses could provide promising findings for clinical use.

No conflict of interest.

ID43

Dickkopf-3 (DKK3), a new player in regulating insulin signal transduction.

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Although DKK3 structurally belongs to the DKK-family (DKK1-4), its origin and function are still under debate. In preliminary work we identified high levels of DKK3 in plasma of patients with type 2 diabetes mellitus (T2DM). Therefore, we hypothesized that pancreatic islets are the major origin of the circulating DKK3, and this protein modulates insulin signal transduction. DKK3 was visualized in isolated pancreatic islets of wild-type (WT) mice. To verify that islets are the main source of DKK3, we determined DKK3 plasma levels in non-diabetic and streptozotocin (STZ)-induced diabetic animals. We elucidated the underlying gene regulatory mechanism using gene reporter assays. Glucose-induced DKK3 expression and secretion were further analysed by qRT-PCR, Western blot and ELISA. Competitive ELISA-based binding assays were performed to identify potential DKK3 binding partners. The potential binding partner of DKK3 was confirmed by surface plasmon resonance (SPR) measurements. To study the function of the released DKK3 from islets, we used liver insulin-resistance in vitro model and examined insulin signal transduction and glucose metabolism. We identified not only a strong expression of DKK3 in pancreatic islets but also markedly reduced plasma levels of this protein in STZ-treated mice. Moreover, the transcription factors pancreatic and duodenal homeobox (PDX)1 and paired box protein (Pax)6 have been shown to be crucial for the expression of DKK3. We found that high glucose increases DKK3 gene expression and release. Of interest, we identified the insulin receptor (IR) as a binding partner of DKK3, whereas insulin and insulin-like growth factor (IGF)1 did not bind to DKK3. We found that palmitate-induced insulin-resistance reduces insulin activity as shown by a decreased IR-dependent signaling cascade. However, the exposure of these cells to DKK3 and insulin restored their capacity to transduce insulin signaling and promote glucose uptake in liver cells. In this study, we demonstrate for the first time that (i) pancreatic islets are the major source of circulating DKK3, (ii) DKK3 binds to the IR and (iii) DKK3 amplifies IR-signal transduction. Accordingly, these findings position DKK3 as a promising candidate for the development of novel protein-based therapeutics targeting diabetes.

No conflict of interest.

ID45

High-Glucose-treated nanofat improves the vascularization and integration of dermal substitutes

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Nanofat, an autologous fat derivate, has been shown to enhance the vascularization and tissue integration of dermal substitutes, such as Integra®, which are frequently used for the initial treatment of large full-thickness skin defects. However, even nanofat-seeded implants still exhibit a rather late onset of vascularization. On the other hand, exposure to high-glucose (30 mM) can activate endothelial cells and promote angiogenesis. Therefore, the aim of the present study was to investigate whether short-term incubation of nanofat in high-glucose improves its vascularization capacity. Inguinal fat pads from green fluorescent protein (GFP)-positive C57BL/6J donor mice were harvested and processed into nanofat via mechanical emulsification and filtration. The nanofat was then incubated in Hanks Balanced Salt Solution with (n = 8) or without (control; n = 8) high-glucose (30 mM) for 1 h. Thereafter, the nanofat was seeded onto Integra® samples (diameter: 4 mm), which were implanted into full-thickness skin defects within the dorsal skinfold chambers of wild-type C57BL/6J recipient mice. The vascularization and tissue integration of the implants were analyzed by means of intravital fluorescence microscopy, histology and immunohistochemistry over 14 days. Data were expressed as means ± SEM, with statistical significance defined as $p < 0.05$. Results: High-glucose-treated nanofat improved the vascularization of Integra®, as indicated by a significantly higher functional microvessel density of the implants' borders during intravital fluorescence microscopy (75.6 ± 12.8 cm/cm2 vs. 21.1 ± 3.8 cm/cm2) and immunohistochemical detection of more CD31-positive microvessels in the implants' center (48.7 ± 14.0 mm-2 vs. 9.7 ± 4.7 mm-2) on day 14 when compared to controls. Accordingly, high-glucose-treated nanofat also improved the tissue integration of Integra®, as demonstrated by a significantly greater deposition of type I collagen in both the borders and center of the implants. Conclusions: These findings suggest that short-term high-glucose stimulation of nanofat represents a promising, clinically feasible strategy to enhance the efficacy of Integra®-based treatments of full-thickness skin defects.

No conflict of interest.

ID46

Endovaskuläre versus offene Therapie des infrarenalen Bauchaortenaneurysmas - unizentrische Beobachtungsstudie zu Therapie-Stratifizierung und „Outcome“

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In der vorliegenden retrospektiven, monozentrischen Observationsstudie (Design) wurden zwei operative Verfahren zur Behandlung des infrarenalen Bauchaortenaneurysmas (AAA) miteinander verglichen: die offene chirurgische Versorgung (Open Aortic Repair, OAR) & die endovaskuläre Aneurysmareparatur (Endovascular Aortic Repair, EVAR). Untersucht wurden 324 konsekutive Patienten, die am Universitätsklinikum Magdeburg behandelt worden waren, davon 207 mittels EVAR & 117 mittels OAR (90,4% männlich; 9,6% weiblich) im Zeitraum 01.01.2006 bis 29.08.2016 - Altersmittelwert von 71,1 Jahren (keinen signifikanten Altersunterschied. - Da ca. 50% der Patienten mit einer Hyperlipidämie keine Statine einnahmen, könnte dies ein Einflussfaktor auf die Entwicklung eines Aneurysmas gewesen sein. - Die 30-Tage-Letalität war insgesamt niedrig & unterschied sich nicht signifikant zwischen beiden Gruppen, wobei ausschließlich bei mit OAR versorgten Patienten zu sehen. - Des Weiteren wiesen Patienten, die endovaskulär versorgt wurden, eine signifikant kürzere Op-Dauer sowie eine deutlich reduzierte postoperative Aufenthaltszeit sowohl im Krankenhaus insgesamt als auch auf der ITS auf. - Auch der postoperative Verlauf zeigte sich nach EVAR günstiger, insbesondere hinsichtlich der hämodynamischen Stabilität & Laborverläufe - so zeigten sich unter EVAR geringere postoperative Anstiege von Kreatinin & Myoglobin sowie ein stabileres Hb-Profil, was auf eine geringere Gewebetrauma-Belastung schließen lässt. - Allerdings wurde bei der endovaskulären Methode eine höhere Rate an Reinterventionen festgestellt, was die Notwendigkeit einer engmaschigen Nachsorge unterstreicht - die offene Op hingegen war mit einem höheren initialen Trauma & längeren Krankenhausaufenthalten assoziiert, erwies sich jedoch im Langzeitverlauf als stabiler & weniger nachsorgeintensiv. - Ein wesentlicher Einflussfaktor auf die Wahl des Verfahrens war der maximale Querdurchmesser des Aneurysmas, der in der OAR-Gruppe signifikant größer war. Die Ergebnisse zeigen, dass beide Verfahren effektive & sichere Therapieoptionen darstellen. Während das EVAR insbesondere für Patienten mit erhöhtem perioperativem Risiko eine schonendere Alternative darstellt, bietet die offene chirurgische Versorgung langfristig eine robustere Stabilität. Die Entscheidung für das jeweilige Verfahren sollte daher stets patientenindividuell unter Berücksichtigung der anatomischen Voraussetzungen, des Risikoprofils & der Lebenserwartung getroffen werden.

No conflict of interest.

ID47

Indizierte offen-gefäßchirurgische Versorgung eines A.-pancreaticoduodenalis-Aneurysmas (APD) bei begünstigend ursächlichem Verschluss des Truncus coeliacus

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Das Viszeralarterienaneurysma (VAA) ist eine eher seltenere Diagnose. Bei 50-80 % der Patienten mit einem VAA der A. pancreaticoduodenalis (APD) od. ihren Ästen liegt eine Stenose od. ein Verschluss des Truncus coeliacus (TC) als zugrundeliegende pathophysiol. Ursache zusätzlich zur ebenso möglich (mit-)bedingenden Inflammation vor. Ziel/Methode: Basierend auf detaillierten fallspezif. Aspekten werden Eckpunkte des herausfordernden & im vorliegenden Fall erfolgreichen gefäßchir. Managements eines APD-Aneurysmas (wissenschaft. “case report”) auch unter Heranziehung relevanter Referenzen der aktuellen med.-wissenschaftl. Literatur umrissen. Ergebnisse (Kasuistik): Eine 52 Jahre alte Patientin wurde bei “erhöhten Leberenzymen” zu einem Oberbauch-CT mit Kontrastmittel überwiesen (beschriebenes APD-Aneurysma - 2,7x2,7cm; nebenbefundlich: Occlusion des TC). Initial wurde die interventionell-radiol. Embolisation als 1. Therapieschritt versucht - leider nicht erfolgreich, da das Aneurysma sich im retrograden Fluss zum TC-Stromgebiet über die A. gastroduodenalis (AGD) aus der A. mesenterica superior (AMS) befand. Daher wurde die offen-gefäßchir. Rekonstruktion vorgenommen, die i) einen autologen supraceliacalen aortohepat. Bypass (mittels V. saphena), ii) die Aneurysmaresektion (Aaneurysmektomie) & iii) die End-zu-End-Anastomose der APD (Ø: 4mm) umfasste. Der postop. Verlauf war unauffällig außer einem paralyt. Ileus, der konservativ beherrscht wurde. Gegenwärtig leidet die Patientin noch an zeitweisen Symptomen einer Gastroparese. Histologie: Keine signifikante Inflammation, keine Malignität. Die Architektur der Gefäßwand war an diversen Lokalisationen gestört (die fibrös-elast. Struktur regelrecht zerfetzt). Schlussfolgerung: Die Indikation für das op. Herangehen war aufgrund der eruierten Aneurysmakonfiguration voll gegeben, gerechtfertigt & notwendig infolge der Größe von >2cm. Die VAA-Behandlung mittels off. Gefäßchirurgie stellt eine Herausforderung dar. Die Ausbildung eines APD-Aneurysmas könnte als eine Konsequenz des erhöhten Blutflusses von der AMS durch die peripancreat. Arkade zum Leberstromgebiet infolge Stenose od. Occlusion des TC mit aneurysmat. Degeneration interpretiert werden, so dass die Rekonstruktion des TC sinnvoll (& eigentlich unabdingbar) erschien, um einem Wiederauftreten vorzubeugen. Das supracoeliace Aortensegment als Ursprungsregion für die art. Rekonstruktion kann als sich zunehmend etablierende & favorisierte Wahloption angesehen werden.

No conflict of interest.

ID50

Functional assessment of mutation-associated neoantigens derived from nonstop mutations in esophago-gastric adenocarcinoma

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Nonstop mutations are a type of genetic mutation in which a stop codon in a gene is replaced by a sense codon leading to an elongated and potentially dysfunctional protein. Nonstop mutations have been identified in various cancer types, including colorectal, lung, and breast cancers, however there is very limited data in gastric cancer. By performing whole exome sequencing of 72 treatment-naïve esophago gastric adenocarcinoma (EGA) patients we detected 11 nonstop mutations. Analysis of the tumor mutational burden of the cohort revealed that nonstop mutations are enriched in tumors highly mutated, with 5/11 (45,5%) patients having microsatellite instability. While there are no direct studies specifically demonstrating that nonstop mutations can generate neoantigens, there is substantial evidence indicating that frameshifts mutations often lead to production of novel protein sequences capable of eliciting immune responses. To check if these novel sequences are recognized by the immune system we selected 4 patients and determined the nucleotide sequence of the transcripts affected by the nonstop mutations. For each nucleotide sequence, the nonstop mutation was introduced in the stop codon and was translated into an amino acid (aa) sequence up to the next stop codon or the end of the transcript (extension). Patient HLA-genotypes were determined and in combination with the extension sequences, HLA-binding peptides were selected using the IEDB tool. These peptides were synthesized and used with patient-derived lymphocytes to determine if the nonstop extensions produce neoantigens. Fluorospot analysis showed no endogenous IFN-γ responses when PBMCs were stimulated with nonstop peptides. In one patient, tumor-derived T cells co-cultured with antigen-presenting cells (APCs) and nonstop peptide exhibited enhanced IFN-γ secretion, indicating a specific immune response. Furthermore, PBMCs-derived T cells expanded with low-dose IL-2, IL-7, and IL-15 in the presence of APCs and nonstop peptides showed antigen-specific expansion of 41BB+CD69+T cells, further supporting neoantigen-specific T cell activation. Taken together, while endogenous responses to nonstop peptides are not broadly detectable in peripheral blood of EGA patients, antigen-specific T cell responses can be elicited and expanded ex vivo, suggesting that nonstop mutations may generate immunogenic neoantigens in selected EGA patients with implications for personalized immunotherapy.

No conflict of interest.

ID55

Establishment of a Proton-Based MRI Method for the Detection of Ischemic Spinal Cord Injury and Evaluation of Neuroprotective Pharmacologic Interventions in a Murine Model

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Spinal cord ischemia (SCI) and the resulting paraplegia remain severe and largely irreversible complications following aortic interventions. Pharmacological prevention strategies would therefore be of considerable clinical relevance. Previous studies in mice have indicated that the administration of recombinant human erythropoietin (rhEPO) and thioredoxin-1 (Trx-1) prior to ischemia may exert neuroprotective effects and improve motor function. The aim of this project was to establish a proton-based magnetic resonance imaging (^{1}H-MRI) technique for the detailed analysis of spinal cord changes in a murine model of SCI. Spinal cord ischemia was induced in ten-month-old male C57BL/6 mice by clamping the thoracic aorta and the left subclavian artery for seven minutes. Mice received intraperitoneal injections of either rhEPO, Trx-1, or placebo immediately before and after the ischemic insult. MRI scans were performed using a 9.4 T Bruker Avance III NMR spectrometer. Each mouse underwent baseline imaging one week before the intervention and follow-up imaging on post-ischemic days 1, 2, 3, and 7. The spinal cord was assessed using T2-weighted sequences as well as quantitative T1 and T2 mapping. In some animals, a gadolinium-based contrast agent was administered prior to imaging to enhance visualization of potential structural changes. The hepatic veins were identified as a reliable anatomical landmark for standardizing the spinal cord imaging level. Mice exhibiting pronounced paraplegia demonstrated significantly increased signal intensity and volumetric expansion of affected spinal cord segments, consistent with edema formation. rhEPO administration mitigated both signal intensity increases and volume expansion, suggesting a neuroprotective effect. Trx-1 showed a similar but less pronounced trend. The findings demonstrate that MRI-detectable spinal cord edema correlates with the severity of motor deficits following ischemic injury. Moreover, administration of rhEPO and Trx-1 was associated with a reduction in edema, supporting their potential as neuroprotective agents in the context of spinal cord ischemia.

No conflict of interest.

ID56

A Macrophage–Tumor Cross-talk: IL-1β Triggers an IL-6 Superinduction in HLE Hepatocellular Carcinoma Cells

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Hepatocellular carcinoma (HCC) is a primary malignancy of the liver, and in 2020, liver cancer affected nearly 906,000 individuals worldwide, with HCC being the most prevalent type. Although treatments with chemotherapy, immunotherapy, and targeted therapy are benefiting more and more patients, HCC is still the third leading cause of cancer-related deaths globally. The tumor microenvironment (TME) profoundly influences HCC progression, particularly through inflammatory cytokines such as interleukin-6 (IL-6) and interleukin-1 beta (IL-1β). To explore macrophage-driven mechanisms underlying differential IL-6 expression in HCC, we cultured Hep3B, HepG2, and HLE hepatocellular carcinoma cells, as well as normal hepatocytes, either alone or in co-culture with macrophages (MP). To mimic an inflammatory condition, these cultures were stimulated with the bacterial toxin lipopolysaccharide (LPS). We observed that LPS significantly upregulated IL-6 expression specifically in HLE cells co-cultured with MP. Such induction was absent in Hep3B, HepG2, normal liver cells, or any monocultured cells. To delineate the underlying mechanism, we collected MP-conditioned medium (CM) following LPS stimulation, and exposed HLE cells to it. Consistent with the co-culture results, MP-derived CM robustly elevated IL-6 expression in HLE cells, confirming that MP secretes potent soluble factors capable of selectively triggering IL-6 induction. Since LPS stimulation also led to a strong induction of IL-1β expression in the MP, we speculated that this might be the secreted factor. And indeed, direct stimulation of HLE cells with recombinant IL-1β resulted in a pronounced, dose-dependent increase in IL-6 expression that was similar to the co-culture mediated induction. Our findings elucidate a specific IL-1β-dependent MP-HCC cell interaction selectively enhancing IL-6 expression in the tumor cells. Ongoing studies will explore how blockade of this cross-talk, using the IL-1β receptor antagonist Anakinra or decoy receptors (Rilonacept), will affect features like proliferation or migration of the HCC cells. Targeting the IL-1β/IL-6 axis may offer a promising new strategy for targeted therapy in HCC treatment in the future.

No conflict of interest.

ID57

5-Aminolevulinic Acid (5-ALA) for Intraoperative Imaging in Patients with Ovarian Cancer – a Single Center Feasibility Study (ILLUMINATE)

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Despite considerable recent advances in the systemic treatment of patients with ovarian cancer, postoperative tumor residue remains the most relevant prognostic parameter with regard to the further course of the disease. Intraoperative molecular imaging is an emerging tool to optimize surgical therapy in ovarian cancer. To examine the feasibility of 5-Aminolevulinic Acid (5-ALA) for intraoperative imaging in patients with ovarian cancer. Intraoperative 5-ALA imaging leads to detection and resection of histologically positive ovarian cancer tumor manifestation that were not scheduled for resection under standard surgical conditions (normal light and palpation). ILLUMINATE is a phase II, single center feasibility study that includes patients with known, suspected or relapsed ovarian cancer, scheduled to undergo cytoreductive surgery. The objectives are to confirm safety and efficacy of 5-ALA (20 mg/kg orally), given 2-4 hours before surgery to detect macroscopic ovarian cancer lesions not detected by palpation and normal white light. Major inclusion criteria are suspected or histologically confirmed, newly diagnosed or relapsed epithelial ovarian cancer, fallopian tube carcinoma, or primary peritoneal carcinoma scheduled for upfront or interval-debulking surgery. Major exclusion criteria are non-epithelial ovarian malignancies and borderline tumors, and preoperative assessment as inoperable.

No conflict of interest.

ID58

Tumor-associated Macrophages in Breast Cancer CNS Metastases – Spatial Distribution, Polarization, and Association with clinical Parameters

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Breast cancer was the most common malignant disease in women worldwide in 2018, with approximately 2.1 million newly diagnosed cases, and in Germany, about one in eight women will develop breast cancer during their lifetime. Although 82% of patients are still alive ten years after the initial diagnosis, a curative treatment is generally no longer possible once metastasis has occurred. One in four women will develop metastases during the course of the disease, with the brain being one of the most frequent sites of metastatic spread. The tumor microenvironment (TME) is a critical factor to consider in the treatment of such metastases, especially when developing new therapeutic strategies. In recent years, the emergence of immunotherapies has introduced a promising new treatment modality. Notable examples include immune checkpoint inhibitors, such as PD-L1 inhibitors, as well as adoptive cell immunotherapy (ACI). The aim of this study was to investigate the spatial distribution of tumor-associated microglia/macrophages (TAMs) in the tumor and stromal tissue of breast cancer brain metastases, with a specific focus on their polarization into M1 and M2 macrophages. Additionally, the study aimed to assess the impact of TAMs on clinical outcomes in these patients, thereby deepening the understanding of macrophage function within the TME and potentially paving the way for future immunomodulatory therapies. For this purpose, tissue sections from a total of 152 samples of breast cancer CNS metastases were prepared and analyzed using immunofluorescence staining with CD163 as a marker for M2 macrophages to assess the spatial distribution of M2 macrophages in relation to tumor and stromal compartments. The stained tissue sections were first digitized and then analyzed using StrataQuest software to quantify individual cells and segment tumor versus stromal areas. Our analyses showed that pre-treatment with glucocorticoids was associated with a shift in the ratio of M1 to M2 macrophages in favor of M2 macrophages, thereby creating a potentially tumor-promoting TME. Furthermore, Kaplan-Meier curve analyses indicated that a higher density of M2 macrophages in the stroma is associated with poorer survival. Ultimately, additional studies involving further macrophage markers and a larger or more uniform study population are necessary to gain a better understanding of the impact of M1 and M2 macrophages on patient outcomes.

No conflict of interest.

ID59

Presence of TGF-β re-sensitizes HCC cells for the potentially tumour-suppressive effects of BMP-9

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Bone morphogenetic protein (BMP)-9, a member of the TGFβ-family of cytokines, is mainly produced in hepatic stellate cells in liver and constitutively circulates in the blood stream in an active conformation in humans. General functions of BMP-9 are rather pro-homeostatic, like antagonizing proliferation and migration and supporting the differentiated state of cells and tissues. In line with this we found that it down-regulates stem cell marker genes like LGR5, PROM1, EPCAM or ANPEP in cultured Hep3B cells. Thereby BMP-9 might act tumour-suppressive in hepatocellular carcinoma (HCC). When comparing the BMP-9 responses in Hep3B with those in HLE (both are human HCC cell lines), we found controversial effects: Although HLE cells express higher levels of the BMP-9 receptor (ALK1) than Hep3B, they respond about 10x less strongly when comparing the BMP-9-mediated induction of ID1 expression. Interestingly, additional stimulation with TGF-β restores this response in HLE but reduces it in Hep3B. This could mean that although the potentially beneficial response to BMP-9 in normal cells can get dampened in tumour cells, additional expression of TGF-β could re-sensitize the cells. To further address this, we collected HCC tumour samples from 10 patients and performed RNA sequencing analyses on them. We divided the samples into low versus high ALK1 expression (n=5 in each group) and found that in ALK1 high tumours ID1 was upregulated together with TGF-β. In parallel several other cytokines (INHBA, PDGFB, CTGF) as well as COL4A1+2 and NOTCH1+2 were also upregulated indicating complex cross-talks of the SMAD-pathways with others that might be relevant for tumour progression. These data imply that although it does not directly signal via ALK1 itself, presence or absence of TGF-β may dictate the responsiveness of the tumour cells to BMP-9 having potential implications for disease progression as well as for therapeutic targeting of this pathway in the future.

No conflict of interest.

ID60

Leberorganoide, generiert aus humanen Gewebeproben als Model für eine Fettleber

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Die Erforschung von Lebererkrankungen wird dadurch erschwert, dass es keine guten Lebermodelle gibt, die komplexe Krankheitsphänotypen getreu nachbilden können. Es werden zunehmend Anstrengungen unternommen, um 3-dimensionale Gewebekulturmodelle, so genannte Organoide, zu erzeugen, die die Situation in vivo angemessen widerspiegeln. Ziel der vorliegenden Studie war daher die Herstellung von Leberorganoiden aus Zellen menschlichen Lebergewebes (personalisiertes Modell), um eine Fettleber als In-vitro-Modell zu erzeugen. Methoden Menschliches Lebergewebe wurde durch enzymatische Behandlung, in Einzel-Zellsuspensionen aufgetrennt und diese in Matrigel kultiviert. Die somit erzeugten Leberorganoide wurden über verschiedene Zeiträume hinweg mit Fettsäuren behandelt. Zelltyp- und Aktivierungs-/Differenzierungs- sowie fettsäurespezifische Marker wurden mittels Real-Time-PCR auf RNA-Ebene bestimmt. Schließlich wurden Paraffinblöcke hergestellt und die Organoide durch H&E- und Immunfluoreszenzfärbungen weiter charakterisiert. Durch Bestimmung von Leberzellmarkern wurde gezeigt, dass die Erzeugung von Leberorganoiden aus menschlichem Primärgewebe möglich ist. Die Bildung einer Fettleber wurde mittels Anfärbung von Lipidtropfen durch Monodansylpentanen visualisiert. Die in vitro Herstellung verfetteter Leberorganoide ist also generell möglich, wobei aber der endgültige Differenzierungsstatus der Zellen von der Grunderkrankung des jeweiligen Patienten (Spenders) abhängt. Nichtsdestotrotz wurde die Proliferation von Hepatozyten, Makrophagen, Myofibroblasten, Gallengangszellen sowie die Expression der Fettsäuresynthase erfolgreich induziert. Somit bietet dieser 3D Zellkulturansatz ein vielversprechendes humanes Modell für die Erforschung zellulärer Krankheitsmechanismen und die Testung neuer Therapieansätze zur Behandlung der Fettleber.

No conflict of interest.

ID61

Comparative in vitro Study of Induced Secondary Resistance in Pancreatic Cancer Cell Lines by the Compounds GP-2250 (Misetionamide) and Olaparib

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1,4,5-Oxathiazine-4,4-dioxide, commonly referred to as Misetionamide, has demonstrated potent antineoplastic properties leading to the downregulation of the cellular energy metabolism and, among others, to a reduction of intracellular NAD+ levels. Its low toxicity profile offers good possibilities for combinational strategies with other chemotherapeutic agents. Poly(ADP-ribose) polymerase (PARP) is a key enzyme involved in the repair of DNA single-strand breaks, catalyzing the conversion of NAD+ to poly(ADP-ribose). PARP inhibitors like Olaparib exert their function via competitive inhibition of this enzymatic activity. The clinical efficacy of PARP inhibition typically requires the presence of BRCA gene mutations, which impair homologous recombination repair pathways. The objective of this study is to elucidate the extent to which the modulation of NAD+ homeostasis affects the therapeutic efficacy of Olaparib in vitro, with particular emphasis on its role in the emergence of secondary resistance to PARP inhibition. Methods: In an in vitro cell culture model of established and primary cell lines, combination – treatment regimens as well as long-term treatment regimens of BRCA-mutated and non-BRCA- mutated pancreatic cancer cell lines were employed to analyze the effect of the combination of Olaparib and Misetionamide and trying to induce secondary resistances. The emergence and extent of the effect and possible resistances were evaluated using cytotoxicity assays (MTT assay). Furthermore, Western blot analyses were used to determine the intracellular PARP protein-levels. Various treatment regimens were tested and compared according to their efficacy. Some of these regimens stood out by enhancing the cytotoxic effect on the viability of the pancreatic cancer cells. The results of the protein analysis are intended to demonstrate the extent to which the impact of intracellular PARP levels are directly associated with the effectiveness of the two compounds. The results of this study will contribute to getting deeper insights into the molecular mechanism of Misetiomide and its potential benefit in an Olaparib based chemotherapeutic treatment regimen of pancreatic carcinoma.

No conflict of interest.

ID62

BMP-9: A modulator of pro-inflammatory immune responses in macrophages

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Liver homeostasis is predominantly maintained by the coordinated function of hepatic stellate cells (HSC), sinusoidal endothelial cells, Kupffer cells (KC), and hepatocytes. These cells dynamically adapt their activities depending on physiological or pathological stimuli to preserve organ function. Bone morphogenetic protein 9 (BMP-9), a cytokine of the TGF-β superfamily, is constitutively secreted by HSC and has been shown to activate KC in response to bacterial infections, thereby initiating immune responses, and enhancing the recruitment of additional macrophages (MP) to the liver. These findings raised the question of whether BMP-9 exerts broader effects on the regulation of pro- and anti-inflammatory immune responses in MP beyond the hepatic environment. Given that resident MP are among the first immune cells to respond to local tissue infections, this study aims at investigating the effects of BMP-9 on MP and their inflammatory responses. Specifically, we examine whether BMP-9 influences MP polarization and immune activation, both of which are critical for infection control. We performed in vitro experiments using bone marrow-derived macrophages (BMDM) isolated from wild-type (WT) and ALK1 (primary BMP-9 receptor) knockout (KO) mice. Cells were treated with recombinant murine BMP-9 for 1h and gene expression levels of ALK1, ID-proteins (as direct targets of the BMP/Smad pathway), inflammatory markers, and M1/M2 polarization markers were analyzed by quantitative real-time PCR. The results confirmed an efficient down-regulation of ALK1 in the KO cells. Several markers showed differential expression in WT versus KO cells but also the direct BMP-9 response changed in the absence of ALK1. The perhaps most striking result was that BMP-9 significantly increased IL-6 expression in WT BMDM but not in the KO cells, suggesting an ALK1 pathway-dependent regulation of this cytokine. Our findings demonstrate that BMP-9 modulates MP activity beyond the hepatic environment, promoting a pro-inflammatory phenotype via ALK1-dependent signaling. The differential response observed in ALK1-deficient MP highlights the importance of this receptor in mediating BMP-9-induced immune activation. Further investigation of these mechanisms may enable targeted modulation, activation, or enhancement of MP immune responses.

No conflict of interest.

ID64

Behandlung gynäkologischer Erkrankungen mittels minimal-invasiver Operationsverfahren: explorativer Vergleich von Laparoskopie und Roboter-assistierter Chirurgie im Hinblick auf Patient-Reported Outcome, sowie peri- und postoperative Morbidität

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Das Ziel der Studie war es, die beiden minimalinvasiven Verfahren Laparoskopie und Roboter-assistierte Chirurgie bei der Behandlung gynäkologischer Patientinnen anhand festgelegter Parameter, besonders im Hinblick auf Schmerz- und Stressniveau sowie die gesundheitsbezogene Lebensqualität, zu vergleichen. Die dabei erhobenen Daten sollten anschließend dazu genutzt werden, die klinische Relevanz beider Verfahren in der operativen gynäkologischen Therapie zu analysieren sowie möglicherweise zukünftig die Auswahl der - für jede Patientin individuell geeigneteren -Operationsmethode zu erleichtern. Wir führten in der Frauenheilkunde des Universitätsklinikums Bonn eine unizentrische prospektive Studie mit insgesamt 100 Patientinnen durch. Die Aufnahme in die Studie setzte voraus, dass bei den Patientinnen entweder im Rahmen der Vorstellung in der gynäkologischen Sprechstunde eine benigne oder maligne gynäkologische Erkrankung diagnostiziert wurde oder eine entsprechende Diagnose mit operativer Therapieindikation bereits vorlag. Weitere Einschlusskriterien waren die schriftliche Einwilligung der Patientinnen in die Studienteilnahme und ein Alter ab 18 Jahren. Ausschlusskriterien waren dementsprechend eine fehlende Einwilligung, eine zu erwartende fehlende Compliance, Kontraindikationen für eine Laparoskopie bzw. Operation mit dem Da-Vinci-Roboter und Herzrhythmusstörungen. Nach gemeinsamer Entscheidungsfindung zwischen einem Arzt/einer Ärztin und den Patientinnen wurden 50 laparoskopisch und 50 mit dem Da-Vinci-Roboter operiert. Zum Vergleich der beiden OP-Methoden wurden prä-, intra- und postoperative Parameter erfasst. Darunter fielen unter anderem zu festgelegten Zeitpunkten Blutentnahmen (ACTH und Cortisol) zur Bestimmung des Stresshormonspiegels, eine intraoperative Schmerzmessung mit dem sogenannten NOL-Index sowie die Dokumentation der Höhe des Kapnoperitoneums, um einen möglichen Einfluss auf das postoperative Schmerzempfinden zu analysieren. Weitere operative Parameter wie Blutverlust, OP-Dauer und Komplikationen sowie die Einnahme von Schmerzmedikation im postoperativen Verlauf wurden ebenfalls verglichen. Ergänzend kamen standardisierte Fragebögen (NRS, VAS, FSFI und SF-36) zum Einsatz, um die aktuelle subjektive Schmerzstärke und die Lebensqualität der Patientinnen zu untersuchen. Insgesamt wurden 100 Patientinnen in unsere Studie eingeschlossen. Die statistische Auswertung erfolgt derzeit und wird im Rahmen der Vorträge präsentiert.

No conflict of interest.

ID65

BMP-9 controls basal hepatic IL-6 expression via ALK1-signalling in macrophages

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BMP-9, a hepatic cytokine belonging to the TGF-β superfamily, is constitutively expressed by hepatic stellate cells in the liver. Its high-affinity receptor ALK1 is highly expressed on liver sinusoidal endothelial cells and Kupffer cells, the resident macrophages (MP) of the liver. While BMP-9s' functions on the epithelium are quite well investigated already, the effects on MP are less well studied yet. We therefore used a mouse model with MP-specific deletion of ALK1 (LysM-Cre/ALK1-flox). While there was no obvious phenotype of these knock-out (KO) mice compared to wild-types (WT), we found by real-time PCR analyses that (among other findings) basal IL-6 expression in the livers of the KO mice became reduced with age. At about 6 months of age this difference became significant. Challenging the mice with a high fat diet (HFD) for four months led to enhanced hepatic BMP-9 expression and increased plasma levels in the WT mice. As expected, HFD feeding was accompanied by enhanced weight gain compared to the control group (fed with normal chow). Interestingly, this weight gain was significantly ameliorated in the KO mice demonstrating a lower liver-to-body weight ratio and reduced blood levels of cholesterol. Our hypothesis is that by controling basal IL-6 levels through ALK1 signalling in MP, BMP-9 seems to promote diet-mediated hepatic fat accumulation. When doing extensive in silico data analyses on human patient cohorts we further found that in HCC specimen with high ALK1 expression the hallmark genes of the IL6/JAK/STAT3 pathway are significantly enriched, implying that also in humans there might be a connection between BMP-9/ALK1 signalling and IL-6. Since IL-6 is known to be involved in pleiotropic functions including inflammation and cancer, and BMP-9 being constitutively expressed under healthy conditions, this cross-relation of these two cytokines in the liver might be profoundly important under conditions of tissue homeostasis as well as adipositas development or other diseases, including cancer. Whether it finally rather contributes to health or to disease remains to be investigated.

No conflict of interest.

ID67

A New Therapeutic Target for Osteoporosis: Arcyriaflavin A as a CDK4 Inhibitor Suppressing Osteoclastogenesis

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Macrophage polarization influences osteoclast differentiation through the JAK-STAT3 pathway, which is negatively regulated by CDK4 via inhibition of STAT3 activation. In this study, we identified Arcyriaflavin A (ArcyA), an indole-based natural compound, as a CDK4 inhibitor and evaluated its effects on osteoclast differentiation to assess its therapeutic potential for osteoporosis. Using bone marrow-derived macrophages (BMMs) from C57BL/6 mice stimulated with M-CSF and RANKL, we demonstrated that ArcyA significantly inhibited osteoclast formation, as shown by TRAP staining. Gene and protein expression analyses (qPCR and Western blot) revealed suppression of osteoclastogenesis markers (NFATc1, c-Fos, TNFrs11a), resorption-related genes (MMP9, Ctsk, Integrin β3), and fusion-related genes (DCstamp, ATP6v0d2). In addition, it was shown that IκB could be a potential target for the inhibitory effect of ArcyA. Functional assays confirmed reduced osteoclastic activity, and similar inhibitory effects were observed in human primary osteoclasts, even at low concentrations (0.1 µM/L). In an ovariectomy-induced osteoporosis (OVX) mouse model, ArcyA treatment alleviated bone loss as assessed by micro-CT analysis. CDK4 inhibition as a novel strategy was highlighted for osteoporosis treatment by suppressing osteoclastogenesis. ArcyA, as a CDK4 inhibitor, effectively reduced osteoclast differentiation and bone loss.

No conflict of interest.

ID68

Systemic T Cell Profile Alterations Correlate with Reduced Bone Density in Individuals with Hemophilia

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Hemophilia (HA) is an inherited bleeding disorder resulting from deficient production of coagulation factors. A frequent complication among persons with hemophilia (PwH) is the early onset of osteoporosis and an increased risk of fractures. Emerging evidence suggests that the immune system significantly influences bone homeostasis; however, detailed data on the cellular immune profiles of PwH—particularly in relation to bone health—remain limited. Understanding these profiles is essential for elucidating mechanisms behind the premature decline in bone mineral density (BMD) and for developing preventive strategies. Hence, this study aimed to compare systemic cellular immune profiles in PwH with normal versus reduced BMD. PwH with either normal or low T-scores (indicative of osteopenia or osteoporosis) were enrolled in this study. Multi-parametric flow cytometry was employed to enumerate the systemic immune cells and assess the frequency of T cells expressing pro-inflammatory cytokines. Pearson correlation analysis was applied to examine relationships between immune subsets and bone health metrics. Receiver operating characteristic (ROC) analysis was conducted to evaluate the diagnostic potential of immune markers in distinguishing between normal and low BMD. PwH with low T-scores exhibited significantly lower frequencies of $CD4^+$ and $CD8^+$ naïve T cells and regulatory T cells (Tregs), alongside elevated levels of $CD4^+$ and $CD8^+$ effector memory (EM) and terminally differentiated effector memory (TEMRA) T cells, compared to those with normal T-scores. $CD8^+$ naïve T cells positively correlated, while $CD8^+$ TEMRA cells negatively correlated with various indicators of bone health. Flow cytometry also revealed increased expression of RANKL on both $CD4^+$ and $CD8^+$ T cells in individuals with low BMD. ROC analysis demonstrated high sensitivity and specificity of $CD4^+$ and $CD8^+$ naïve T cells, EM, TEMRA, and Tregs in differentiating low versus normal BMD status. PwH with decreased BMD exhibit a distinct immunological signature, characterized by a reduction in naïve T cells and Tregs and an increase in EM and TEMRA subsets. These immune alterations may contribute to bone loss and serve as potential biomarkers for early detection and intervention.

No conflict of interest.

ID70

Chancen, Optionen und Aussichten der Digitalisierung in Lehre und Ausbildung am repräsentativen Beispiel der Herzchirurgie mit ihren Auswirkungen auf weitere chirurgische / operative Fachdisziplinen

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KI (Künstl. Intelligenz), online-Seminare, virtuelle Realität i. R. der Digitalisierung usw. kommen immer häufiger in tägl. berufsassoziierten & privaten Korrespondenzen & Gesprächen vor. Die Digitalisierung bietet neue Möglichkeiten, um diese Herausforderungen zu bewältigen sowie Lehre & Ausbildung effektiver zu gestalten. Es wird die Rolle der Digitalisierung in der fachärztlichen Ausbildung von chir. Assistenzärzten, insbesondere Herzchirurgie illustriert; vor allem werden die fachspezif. Gegebenheiten, tendenziellen Veränderungen sowie die univ. Voraussetzungen für Ausbildung & Lehre beschrieben. Repräsentative Übersicht, basierend auf i) selektiven themenbezogenen Referenzen zur aktuellen med.-wissenschaftl. Literatur & ii) eigenen klin.-didakt. Lehrerfahrungen aus der tägl. Praxis des chir. Fachgebiets. Ergebnisse (Eckpunkte): • Die Corona-Pandemie hat neue Methoden der online-Lernplattformen aufgezeigt & damit den Zugang zu unbegrenztem Wissen erweitert. Dies bietet (nicht nur) AssistenzärztInnen die Möglichkeit, von zu Hause aus an wissenschaftl. Veranstaltungen „am anderen Ende der Welt" teilzunehmen & Erfahrungen mit Kollegen weltweit auszutauschen. • Die Einführung digitaler Methoden wie Simulationen & „E-Learning"-Plattformen hat die chir. Ausbildung revolutioniert. • Diese Methoden ermöglichen es, komplexe Eingriffe realitätsnah zu üben & theoret. Wissen interaktiv nicht nur in geeigneter Weise modellhaft anzuwenden, sondern auch zu vertiefen. • Die digitale Unterstützung trägt dazu bei, die Ausbildung praxisorientierter & effektiver zu gestalten, indem sie die Integration der Studierenden in den Klinikalltag fördert. • Die Nutzung von KI ermöglicht AssistenzärztInnen einen besseren & effektiveren Zugang zu neuen med. Informationen & bietet Unterstützung bei der Texterstellung & Problembewältigung im berufl. Alltag. Hier liegt das größte Entwicklungspotential dieser Technik: die wichtigste Ressource für einen Arzt – Zeit – zu sparen. • Obwohl die Möglichkeiten der virtuellen Realität derzeit (noch) begrenzt sind, zeigen sie ein enormes Wachstumspotenzial & werden in Zukunft einen immer größeren Anteil der Ausbildung ausmachen sowie diese weiter verbessern & vervollkommnen. Die Digitalisierung wird in den nächsten Jahren eine zentrale Rolle in der chir. Ausbildung spielen & sie kontinuierlich verbessern. Die Integration digitaler Methoden wird sowohl die Effizienz als auch die Qualität der Ausbildung nachhaltig steigern.

No conflict of interest.

ID71

Investigation of Molecular Risk Factors and Characteristics of Postoperative Pancreatic Fistula

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Surgical resection remains the primary treatment for patients with resectable pancreatic cancer. Despite advances in surgical techniques and perioperative care, postoperative pancreatic fistula (POPF) remains a frequent and serious complication after pancreatic surgery. POPF is associated with increased morbidity and mortality, prolonged hospitalization, need for reoperation, and reduced quality of life. Severe cases may lead to infection, sepsis, hemorrhage, multi-organ failure, and death. These outcomes result primarily from the leakage of digestive enzymes into the abdominal cavity, causing autodigestion and damage to adjacent organs and vessels. Improving postoperative outcomes requires early prediction of POPF occurrence and severity, as well as a deeper understanding of its molecular and physiological basis to guide targeted therapies. This study aims to molecularly characterize POPF and identify prognostic risk factors. Organoids derived from healthy pancreatic tissue obtained during surgery serve as a key model for studying cellular and tissue alterations. Alongside histological characterization, expression analyses in organoids and primary tissue focus on proteins involved in pancreatic juice secretion and tissue integrity within acinar and ductal cells. Identifying protein expression changes may reveal risk factors predisposing patients to POPF or severe disease courses and improve understanding of POPF pathophysiology. Additionally, biochemical and proteomic analyses of pancreatic secretions seek novel biomarkers for early POPF prediction. Such biomarkers enable rapid, targeted postoperative interventions to optimize outcomes and patient well-being. Results from organoid studies and secretion analyses will be correlated with clinical data to validate findings. Pancreatic secretion samples also provide a valuable resource for biomarker discovery. This study emphasizes the importance of pancreatic secretion protein composition as a key factor in early POPF detection, aiming to enhance postoperative management and improve clinical outcomes.

No conflict of interest.

ID72

Efficacy of Combination Therapy with FOLFIRINOX Components and GP-2250 (Misetionamide) – An In Vitro and In Vivo Study in Pancreatic Cancer Models

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In addition to surgical resection, chemotherapy represents a corner stone in the treatment of pancreatic cancer, both in curative and palliative settings. Depending on the ECOG performance status, combination therapies are used, most commonly based on the FOLFIRINOX regimen or Gemcitabine. Despite recent advances, these treatment strategies remain limited by significant side effects and the development of secondary resistance. Median disease-free survival is still unsatisfactory. After resection and adjuvant therapy with mFOLFIRINOX, it is only 21,6 months, and with Gemcitabine monotherapy just 12,8 months. These outcomes highlight the urgent need for novel therapeutic approaches. One promising candidate is GP-2250 (Misetionamide), an oxathiazine derivative with antiproliferative and antineoplastic properties. It acts by interfering with glucose metabolism and inhibits oncogenic signaling pathways such as NF-κB and Cyclin D1. A major advantage of Misetionamide is the absence of observed secondary resistance to date. In addition, a pronounced synergistic effect has been demonstrated when combined with Gemcitabine. Given the superiority of FOLFIRINOX over Gemcitabine, the question arose whether a combination with Misetionamide could also be effective and well-tolerated within the FOLFIRINOX regimen. Initial in vitro studies investigated potential synergistic effects of Misetionamide in combination with individual components of the FOLFIRINOX protocol. MTT assays were conducted on three pancreatic cancer cell lines, and the Chou-Talalay index was calculated to quantify synergy. Encouraged by promising results, the experiments were extended to a PDX model using five different tumor samples. However, the positive in vitro findings could not be confirmed in vivo. No significant differences were observed between monotherapies with FOLFIRINOX components and the combination therapy with Misetionamide. One possible explanation is that the high drug concentrations required to achieve synergistic effects in vitro could not be replicated in vivo due to the toxicity of the FOLFIRINOX components. Despite these limitations, this highlights the observed synergy between Misetionamide and Gemcitabine especially for vulnerable patients with a lower performance status. Based on the preclinical data, a Phase I clinical trial investigating the combination of Gemcitabine and Misetionamide was initiated in the United States and has already yielded promising interim results.

No conflict of interest.

ID73

From Ablation to Reconstruction: Transforming Amputation Surgery to Restore Function and Reduce Pain

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Amputation surgery is undergoing a fundamental paradigm shift—from a historically ablative procedure to a reconstructive, function-oriented intervention. With over 62,000 amputations performed annually in Germany and one occurring globally every 30 seconds, the urgency for innovation in surgical strategy is undeniable. At Hannover Medical School, a Level I trauma center, we have implemented a suite of advanced amputation techniques since 2022, integrating them into clinical routine for both primary amputations and residual limb revision surgeries. Our approach includes Targeted Muscle Reinnervation (TMR), Targeted Sensory Reinnervation (TSR), Regenerative Peripheral Nerve Interfaces (RPNI), Agonist-Antagonist Myoneural Interfaces (AMI), and Osseointegration (OI). Each technique serves a distinct reconstructive goal—enhancing motor control, sensory feedback, proprioception, and mechanical stability—while simultaneously reducing complications such as neuroma formation and phantom limb pain. TMR and TSR optimize neuromuscular and sensory interfaces, facilitating intuitive prosthetic use and promoting cortical reintegration. RPNI, a simplified alternative, stabilizes nerve endings through muscle grafts and prevents painful neuroma development. AMI restores dynamic muscle interplay, enabling proprioceptive feedback and natural limb kinematics. Osseointegration allows direct skeletal prosthetic attachment and offers increased load transfer and osseoperception, though its use is reserved for selected cases. In this talk, we present our structured treatment algorithm and demonstrate how the application of these techniques—particularly during primary amputation—leads to measurable improvements in functional outcomes and pain reduction. Early results from our center suggest that initiating reconstructive strategies at the time of amputation not only enhances prosthetic integration and motor performance but also positively affects long-term quality of life and rehabilitation trajectories. By shifting the surgical objective from mere tissue removal to functional restoration, we propose a new standard of care that unites surgical innovation, neurorehabilitation, and personalized prosthetic technology in amputation medicine.

No conflict of interest.

ID74

“Bridging Surgical Innovation and Function: A non-invasive Feedback System to Improve Gait After Limb Loss”

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Current high-tech lower limb prostheses lack natural sensory feedback, often resulting in unphysiological gait patterns, increased fall risk, and higher cognitive effort. Although sensory feedback has shown promise in research, no system has yet reached widespread clinical adoption or user acceptance. This study evaluated the effect of a non-invasive, gait-synchronized vibrotactile feedback system (VTFS) on gait performance in individuals with lower limb amputation. Eleven amputees (9 unilateral, 2 bilateral; mean time since amputation: 6.9 years) used a portable VTFS at home for up to 120 days. The system translated real-time plantar pressure into vibrotactile stimulation on the residual limb. Pre- and post-intervention assessments included the Timed Up and Go Test (TUG), Four Square Step Test (FSST), 10-Meter Walk Test (10MWT), and 2-Minute Walk Test (2MWT). User satisfaction was recorded via Likert scale ratings and willingness to continue use. After an average of 8 weeks, participants showed a statistically significant improvement in gait stability (TUG, $p < 0.05$). Clinically relevant gains were observed in gait speed (45%) and coordination (36%). Performance changes were not correlated with duration of system use or time since amputation. Notably, the participant with prior Targeted Sensory Reinnervation (TSR) showed the most pronounced improvements. User feedback was positive: 36% rated the system as “good,” 27% as “best,” and 45% expressed a desire to continue using it. Short-term use of the VTFS led to measurable improvements in gait parameters among diverse amputees. The exceptional outcome in the TSR patient suggests a synergistic potential between surgical sensory restoration and non-invasive feedback. These findings support further investigation into combined neuroprosthetic approaches for enhanced functional rehabilitation in amputees.

No conflict of interest.

ID76

Crossing borders: what international exchange teaches us about skills, systems, and ourselves- life long learning in surgical education

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For 30 years the Initiative '93 Travel Fellowship USA offers a six-week immersive learning experience designed to foster clinical, technical, and scientific growth through international exchange. Three physicians and one certified prosthetist/orthotist (CPO)—travel to the USA to visit leading institutions in the field of patient care, rehabilitation, assistive devices and research in Technical Orthopaedics. The interdisciplinary setup is central to the fellowship's impact. For the CPO, witnessing live surgical procedures is reported to be as eye-opening as the physicians' deep dive into prosthetics manufacturing and rehabilitation technology. This mutual exchange of skills sharpened interdisciplinary understanding and clinical empathy. Exposure to advanced methods, such as neuromuscular interface systems and high-resource military care structures, challenged conventional approaches and reveals the power of integrated, translational workflows. At every stop, participants engage in structured discussions and presentation of their own research with internationally renowned experts to explore cutting-edge research and treatment strategies. These encounters not only enriched scientific knowledge but also build a sustainable international network. Beyond technical advancement, the experience fosters critical reflection: How do funding systems shape care? What does truly patient-centered innovation look like? And most importantly: How must surgical training evolve to meet tomorrow's needs? Lifelong learning, global exchange, and interprofessional collaboration are not optional for future surgeons—they are essential. Fellowships like this challenge comfort zones and offer more than knowledge: they build the mindset for reflective, adaptive, and networked (surgical) leadership. The 2024 cohort embarked on a structured learning journey through Boston, Seattle, Minneapolis, Rochester, Chicago, Washington D.C., and Miami—visiting leading institutions such as MIT, Northwestern University, the Mayo Clinic, and Walter Reed Medical Center. Along the way, they engaged directly with internationally renowned experts including Prof. Hugh Herr (MIT), Dr. Gregory Dumanian (Northwestern), and Dr. Benjamin Potter (Walter Reed). These immersive encounters offered rare insights into cutting-edge surgical techniques, interdisciplinary models of care, and translational research pipelines. For early-career surgeons, such exposure not only enriches current training but also lays the foundation for fellowships, international collaborations, and specialized career paths that extend far beyond residency. During CFT 2025, the 2024 cohort would like to report on this experience and share key reflections on how such opportunities can be leveraged to expand the scope of surgical education and professional development.

No conflict of interest.

ID78

From Lab to Living Room: Cyberful - Translational Virtual Reality Rehabilitation for Arm and Hand Recovery

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Functional and pain disorders of the upper limb are a major clinical and socioeconomic challenge, frequently leading to chronic impairment, reduced participation, and high long-term costs. Conventional rehabilitation often faces barriers such as limited therapy frequency, long waiting times, and restricted access to specialists, especially for patients with chronic or complex injuries. To address these gaps, Cyberful, a novel virtual reality (VR) system, was developed within a university research setting and systematically translated into real-world application for the sensorimotor rehabilitation of arm and hand conditions. This translational project bridges cutting-edge academic research and everyday clinical practice, demonstrating how innovative technology can be brought from the lab directly into patients' homes. Cyberful delivers guided movement exercises, mirror therapy, and motor imagery in an immersive, gamified environment using the Meta Quest 3 headset and intuitive hand tracking. The modular software enables highly individualized training, adapts to each patient's functional abilities, and provides real-time feedback, supporting both early intervention after injury and long-term rehabilitation in clinical, outpatient, or home-based settings. Advanced tracking and user-friendly design lower the threshold for daily self-directed therapy, even for users with little technical experience. Initial clinical experiences and pilot studies show high user motivation and a measurable reduction in pain intensity, even in patients with severe or long-standing conditions. By facilitating therapy independent of location and infrastructure, Cyberful offers a scalable, cost-effective solution to increase therapy adherence and reduce the risk of chronification and long-term disability. The system's flexible structure and evidence-based approach make it well-suited for integration into modern rehabilitation pathways. Cyberful exemplifies the successful translation of academic innovation into practical digital health. The project's collaborative, multidisciplinary approach paves the way for future advances in digital rehabilitation and underlines the potential of university-initiated research to transform patient care and health-economic outcomes for people living with upper limb injuries and chronic pain.

Conflict of interest:

Co-Founder and CTO of NeuroXR

ID81

Extrazelluläre Vesikel immortalisierter MSCs (ciMSC-EVs) - Untersuchung des therapeutischen Potenzials im Knorpelzellinflammationsmodell

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Extrazelluläre Vesikel mesenchymaler Stromazellen (MSC-EVs) können Knorpelzellen im inflammatorischen Milieu positiv beeinflussen und regenerative Prozesse stimulieren. Hierbei unterscheiden sich jedoch die EVs verschiedener Spender sowie verschiedener Batches in ihrem funktionellen Phänotyp. Um eine bessere Reproduzierbarkeit bei der Herstellung unabhängiger EV-Batches zu erreichen, wurden MSCs immortalisiert und auf monoklonaler Ebene expandiert. Im Rahmen dieser Studie wurde untersucht, inwieweit EVs von klonal expandierten, immortalisierten MSCs (ciMSCs) therapeutisch relevante Effekte im inflammatorischen Knorpelmodell vermitteln. Bovine artikuläre Chondrozyten wurden standardisiert kultiviert und in Passage 3 in Spheroidkultur verbracht. Zur systematischen Untersuchung erfolgte die Hinzugabe von EV-Präparaten sechs verschiedener ciMSCs in einem standardisierten Inflammationsmodell mit TNFα (20 ng/ml) in einem Zeitraum von 48h. Zur Beurteilung des Regenerats wurde das Genexpressionsprofil von anabolen (Collagen 2, Aggrecan, COMP, PRG4), katabolen (MMP3, MMP13, ADAMTS4, ADAMTS5), Dedifferenzierungs- (Collagen 1) Markern und den inflammatorischen Zytokinen IL-6 und IL-8 bestimmt. Selektiv erfolgte die Untersuchung potentiell anabol stimulierender ciMSC-EVs im Inflammationsmodell über 14 Tage. Es erfolgte hiernach die Untersuchung der Regeneratqualität mit einer SafraninO/Fast Green Färbung. Zur statistischen Auswertung wurde der nicht parametrische Mann-Whitney U-test herangezogen. Die Signifikanz wurde mit $p<0.05$ definiert. Die Hinzugabe von TNFα führte zu einer signifikant reduzierten Expression anaboler Marker (Collagen 2, Aggrecan, COMP), einer verstärkten Expression kataboler Marker (MMP3, MMP13, ADAMTS4, ADAMTS5) und einer Stimulation des proinflammatorischen Zytokins IL-6. Vergleichbar mit den Ergebnissen primärer MSC-EVs wurde nach Hinzugabe von ciMSC-EVs die Expression von PRG4 stimuliert, gleichzeitig jedoch auch katabole und inflammatorische Marker verstärkt exprimiert. Es zeigten sich Unterschiede zwischen den einzelnen EV-Präparaten im Hinblick auf die Ausprägung der inflammatorischen Einflüsse und Expression anaboler Marker. Bei der Auswahl von ciMSCs ohne Stimulation inflammatorischer Marker konnte ein anaboler Effekt nach 14 Tagen mit vermehrter Einlagerung von Proteoglykanen festgestellt werden. TNFα hat einen negativen Einfluss auf Chondrozyten. Dieser kann durch hergestellte ciMSC-EVs verringert werden. Die anabolen Effekte selektiver ciMSC EV-Batches auf Knorpelzellregenerate lassen sich nach standardisiertem Screening im Knorpelzellinflammationsmodell nachweisen.

No conflict of interest.

ID82

Vanillic Acid Reduces NET Formation by Inhibiting ROS Generation through Activating AMPK/AKT/Nrf2 Signaling

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Chronic wounds like diabetic foot ulcers are characterized by persistent inflammation. In this process neutrophils release so-called neutrophil extracellular traps (NETs) to eliminate invading pathogens. However, overproduction of NETs may also contribute to tissue damage. Reactive oxygen species (ROS) are key drivers of NET formation, promoting oxidative damage and pro-inflammatory signaling including adenosine monophosphate kinase (AMPK), protein kinase B (AKT) and nuclear factor erythroid 2-related factor 2 (Nrf2). Vanillic acid (VA) is a phenolic compound with known antioxidative effects, however, its role in regulating NET formation is still unclear. The present study aimed to investigate mechanistic effects of VA on neutrophil activation and oxidative signaling. Primary neutrophils were isolated from EDTA-blood of healthy and diabetic donors using density gradient centrifugation. Cells were pretreated with VA (0.5–500 µM) for 3 hours and then stimulated with 100 nM PMA to induce ROS production and NET formation. Viability was assessed by Calcein-AM assay. Intracellular ROS levels were measured by DCFH-DA and DHR-123 assays, while NETs were quantified using Sytox Green assay and visualized by immunofluorescence staining. Western blotting was performed to analyze AMPK, AKT and Nrf2 expression. Statistical analysis was conducted using the Kruskal–Wallis test with Dunn's post hoc test (GraphPad Prism). Results VA at 0.5–500 µM did not significantly affect neutrophil viability as determined by Calcein-AM assay. VA dose-dependently reduced intracellular ROS levels (75% reduction with 500 µM VA pretreated and 65% reduction with 50 µM VA pretreated) and NET formation (40% reduction with 500 µM VA pretreated and 30% reduction with 50 µM VA pretreated). Immunofluorescence revealed VA treatment led to a retention of neutrophil elastase near the cell membrane in PMA-stimulated neutrophils. Western blot analysis showed increased phosphorylation of AMPK, Akt and Nrf2 following VA treatment. Thus, non-toxic concentrations of VA reduced PMA-induced ROS production and NET formation in a dose-dependent manner. Mechanistically, VA was shown to activate the AMPK/AKT/Nrf2 pathway, enhancing antioxidant defenses. These findings suggest that VA effectively attenuates oxidative stress and suppresses NET formation and release in neutrophils, highlighting its therapeutic potential in chronic inflammation.

No conflict of interest.

ID83

Tailoring Nanocarrier Interfaces: Comparative Evaluation of Polymer-Coated Chrysin-Iron Oxide Nanoparticles for Colon Cancer Therapy

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Chrysin, a bioactive flavonoid, has demonstrated promising anticancer activity but suffers from low bioavailability and rapid metabolism, limiting its clinical utility [1]. Iron oxide nanoparticles (IONPs) offer a compelling platform for drug delivery owing to their superparamagnetic behavior, biocompatibility, and surface modifiability [2]. Objective: This study aimed to compare the physicochemical properties and anticancer efficacy of chrysin-loaded IONPs coated with chitosan (Chi/IONPs) and dextran (Dex/IONPs) in human colorectal carcinoma (HCT-116) cells. Fe_3O_4 nanoparticles were synthesized via co-precipitation and separately coated with either chitosan and dextran. Chrysin was incorporated through physical adsorption using DMSO as the solvent. Drug loading efficiency was calculated spectrophotometrically, and cell viability was assessed via the MTT assay following 24-hour exposure to varying concentrations (0–40 µg/mL). Statistical comparisons were conducted using ANOVA with Tukey's post-hoc test. Chi/IONPs exhibited moderate cytotoxicity, while Dex/IONPs showed significantly enhanced anticancer efficacy, with the lowest cell viability values and greater apoptosis induction. Structural characterization via X-ray diffraction (XRD) revealed peak distributions typical of the face-centered cubic spinel structure of magnetite in both chitosan- and dextran-coated IONPs. A dominant diffraction peak at ~35° (311), along with peaks at 43°, 54°, 57°, and 63°—corresponding to the (400), (422), (511), and (440) planes—confirmed the retention of crystalline structure. Reduced peak intensities, particularly in dextran-coated samples, suggested the presence of amorphous polymer layers. Crystallite size estimations using Scherrer's formula indicated nanocrystalline domains of approximately 17–20 nm in both formulations. While both polymer coatings effectively stabilized the IONPs, the Dex/IONP formulation exhibited a higher drug loading efficiency (54%), contributing to its superior cytotoxic activity in HCT-116 cells. These findings highlight the better structural adaptability and drug-loading capacity of Dex/IONPs compared to Chi/IONPs, supporting their potential as nanocarriers for anticancer therapy. Among the tested systems, Dex/Chry nanoparticles emerged as the most effective formulation, achieving superior cytotoxicity in HCT-116 cells. These results suggest that dextran offers a more favorable nanocarrier interface for chrysin delivery than chitosan. The study underscores the critical role of polymer selection in optimizing nanoparticle-based drug delivery for colorectal cancer treatment.

References: 1.Talebi, M., Talebi, M., Farkhondeh, T., Simal-Gandara, J., Kopustinskiene, D. M., Bernatoniene, J., & Samarghandian, S. (2021). Emerging cellular and molecular mechanisms underlying anticancer indications of chrysin. Cancer Cell International, 21, 1-20. 2. Mahmoudi M, Sant S, Wang B, Laurent S, Sen T. Superparamagnetic iron oxide nanoparticles (SPIONs): development, surface modification and applications in chemotherapy. Adv Drug Deliv Rev. 2011;63(1-2):24-46. doi:10.1016/j.addr.2010.05.006

No conflict of interest.

ID84

Effect and feasability of thermal ablation techniques in an in-ovo model of pancreatic cancer

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Pancreatic adenocarcinoma ranks among the solid tumors with the lowest 5-year survival rates worldwide. Due to its late symptoms and early metastasis, the surgical options for curative treatment are limited. Among other things the guidelines of the German and American societies do not recommend surgical treatment in the present of metastases of pancreatic carcinoma. Despite the current recommendations, recent primary and secondary studies have shown that the surgical resection of pancreatic tumor in combination with the treatment of existing metastases in contrast to a non-surgical treatment can improve patient outcomes. As a possible option for the treatment of metastasis, thermoablative techniques such as local radiofrequency and microwave ablation have been applied successfully in the treatment of other solid tumors. Previously performed case studies have shown positive effects on the patient survival after the thermal ablation of pancreatic cancer metastases as part of a multimodal therapy concept. To our knowledge, the direct effect of thermoablative procedures on the tumor tissue has not yet been investigated. In this regard, we would like to start our project at this point in order to gain new insights into the application of thermoablative procedures. The aim of our experimental project is to investigate the effect of the application of thermoablative procedures on a tissue and cell level. Therefore we use the chorio-allantoic membrane model (CAM) as an ethically acceptable model that gives us the opportunity to grow adequate pancreatic tumors in a short time and to apply thermoablative procedures. With the help of various histological and immunohistochemical stainings, we have the possibility to analyze the effect of thermoablative procedures in tumor tissue. Initial results show the successful application of thermoablative techniques in the CAM model. Furthermore, we have already been able to show that treatment using radiofrequency and microwave ablation leads to local necrosis and a simultaneous decrease in the proliferation of cells in the tumor tissue.

No conflict of interest.

ID85

Biomechanical Evaluation of Fixation Methods for Porcine Intestine in Surgical Research

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Understanding biomechanical properties of intestinal tissue is essential for advancing knowledge in gastrointestinal anastomotic healing. Tensile strength testing is one of the most standardized and reliable approaches for ex vivo evaluation. However, fresh intestinal tissue is not always available and the use of fixation techniques may alter the biomechanical characteristics of the samples and affect the validity of test results. This study aims to investigate and compare the biomechanical impact of commonly used preservation techniques on porcine small intestine with that of fresh tissue. A Zick/Roell tensile testing machine was used to apply longitudinal force to porcine intestinal segments. Two synchronized cameras documented the tearing process from different angles. We evaluated stress-strain behaviour, stiffness, and maximum breaking strength across three preservation methods: frozen-thawed, ethanol (35%), and formalin-fixed. Fresh intestine was incubated in PBS for same-day testing, served as the control. Each preservation method was assessed after 7 and 14 days. In total, 70 segments (n=10 per group) were analysed. Stress-strain curves were generated, and mechanical parameters were computed using a custom MATLAB algorithm. Significant differences in stiffness were observed compared to fresh tissue for frozen-thawed ($p = 0.0238$) and formalin-fixed ($p = 0.0036$) samples, while ethanol-preserved tissue showed no significant change ($p = 0.2348$). Duration of storage also affected outcomes: stiffness differed significantly after 14 days for frozen-thawed tissue ($p = 0.0248$) and already after 7 days for formalin-fixed samples ($p = 0.0024$). Both preservation technique and storage duration substantially influence the biomechanical properties of porcine intestine. These findings are crucial when designing reliable and reproducible ex vivo models in surgical research. Moreover, they highlight the broader importance of accounting for preservation-related changes in biomechanical studies involving any biological tissue. Further investigations should explore ways to reduce such alterations and enhance the comparability of preserved and fresh specimens.

No conflict of interest.

ID86

DEPROMP Studie: Konkordanz der Prostatakarzinomausdehnung zwischen MRT, PSMA-PET/CT und Histopathologie

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Differenzen der präoperativen Bildgebung und der tatsächlichen Tumorausdehnung (TA) stellen eine Herausforderung in der Therapieplanung des lokalisierten Prostatakarzinoms (PCa) dar. Diese Studie untersucht inwiefern die TA zwischen MRT, PSMA-PET/CT und Prostatektomiepräparat divergiert. Im Rahmen der DEPROMP Studie wurde die TA aus präoperativer MRT und PSMA-PET/CT sowie dem finalen histologischen Prostatektomiepräparat bei 97 Männer verglichen. Es wurden 4 TA-Subgruppen definiert: 3,5cm². Die Konkordanz-Analyse umfasste eine Bland-Altman-Analyse und der Wilcoxon-Vorzeichen-Rang-Test. Unabhängig von der eingesetzten Bildgebungsmodalität zeigten sich signifikante Abweichungen zwischen den präoperativ ermittelten und den histopathologisch bestätigten TA-Werten ($p < 0,001$ für PSMA-PET/CT und MRT). Während die MRT die TA systematisch unterschätzte, zeigte die PSMA-PET/CT eine Tendenz zur Überschätzung. Die Übereinstimmung zwischen Bildgebung und Histopathologie war signifikant abhängig von der Tumorgröße ($p < 0,001$): PSMA-PET/CT überschätzte die TA konsistent über alle Subgruppen hinweg, wohingegen die MRT mit zunehmender Läsionsgröße eine verstärkte Unterschätzung aufwies. Die Diskrepanz zwischen präoperativer Bildgebung und tatsächlicher Tumorausdehnung sollte in der Therapieplanung des lokalisierten PCa berücksichtigt werden. Die aktuellen DEPROMP Daten unterstreichen die Bedeutung der PSMA-PET/CT für eine präzisere Lokaltherapieplanung.

No conflict of interest.

ID87

Externe Validierung des P-Scores im DEPROMP-Studienkollektiv: Optimierte Detektion klinisch signifikanter Prostatakarzinome durch MRT und PSMA-PET/CT

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Der kombinierte Einsatz von PSMA-PET/CT und MRT kann den negativen prädiktiven Wert (NPV) und die Sensitivität für klinisch signifikante Prostatakarzinome (csPCa) erhöhen. Ziel dieser Studie war, den von Emmet et al. entwickelten P-Score, eine Kombination aus PRIMARY- und PI-RADS-Score, erstmals in einer externen Kohorte zu validieren. In der prospektiven DEPROMP Studie wurden 230 biopsie- und bildgebungsnaive Männer vor Prostatabiopsie mit multiparametrischer MRT und PSMA-PET/CT untersucht. Die MRT-Bilder wurden gemäß PI-RADS v2.1 bewertet, die PSMA-PET/CT-Bilder gemäß PRIMARY-Score. Die diagnostische Leistung des P-Scores und einer modifizierten Version wurden mit dem jeweiligen PI-RADS- und PRIMARY-Score anhand der Fläche unter der Receiver-Operating-Characteristic-Kurve (AUC) verglichen. Unsere externe Validierung im DEPROMP Studienkollektiv bestätigte die diagnostische Leistungsfähigkeit des P-Scores zur Erkennung von csPCa vor Biopsie (AUC: 0,79; 95%-Konfidenzintervall [KI]: 0,73–0,85). Im Vergleich zum PI-RADS-Score (AUC: 0,80; 95%-KI: 0,75–0,86) erreichte der P-Score eine um 5% höhere Sensitivität bei vergleichbarem NPV. Vergleichend zum PRIMARY-Score (AUC: 0,72; 95%-KI: 0,66–0,78) zeigte sich eine um 4% höhere Sensitivität samt 3% höherem NPV. Der von uns modifizierte P-Score zeigte im Vergleich zum P-Score eine weitere 2%ige Steigerung der csPCa Diagnose. Der P-Score verbessert die Detektion von csPCa im Vergleich zum PI-RADS- oder PRIMARY-Score. Gleichzeitig kann er dazu beitragen unnötige Biopsien weiter zu reduzieren.

No conflict of interest.

ID91

Growth Differentiation Factor 15 Drives Therapy Resistance Through Tumor–CAF Crosstalk and Immune Modulation in Esophageal Adenocarcinoma

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Immune cells and cancer-associated fibroblasts (CAFs) play key roles in tumor initiation and progression within the tumor microenvironment (TME). Targeting GDF15 has shown clinical potential in reversing resistance to immunotherapy. Our aim is to investigate the molecular mechanisms driving treatment resistance in esophageal adenocarcinoma (EAC), with a particular emphasis on the role of GDF15. Transcriptomic analysis was used to identify potential factors that were involved in CAF-tumor interaction. Lentiviral transduction established stable GDF15 knockdown in EAC cells and CAFs. In vitro viability and apoptosis assays evaluated EAC cell sensitivity to chemo- and radiotherapy. To study the effects of GDF15 on immune cells in the TME and to investigate immunotherapy resistance, a co-culture system was established using PBMCs from healthy donors, EAC cells, and patient-derived CAFs. In vitro assays demonstrated that CAFs enhance resistance of esophageal adenocarcinoma (EAC) cells to both chemotherapy and radiotherapy. Transcriptomic profiling of tumor–CAF co-cultures revealed significant enrichment of GDF15, with opposing expression patterns in tumor cells and CAFs. Knockdown of GDF15 in OE33 and OE19 cells restored treatment sensitivity, an effect that was similarly observed when co-cultured with GDF15-depleted CAFs. Furthermore, PBMCs exposed to the tumor–CAF co-culture exhibited upregulated expression of GDF15, IL6, CXCL1, and CXCL2, indicating a shift toward an immunosuppressive microenvironment. GDF15 depletion in EAC cells reduced resistance, indicating GDF15 acts both as a paracrine factor from CAFs and an intrinsic regulator in tumors. GDF15 contributes to the formation of an immunosuppressive microenvironment by modulating immune cells, and upcoming single-cell RNA sequencing of PBMCs from the co-culture system will help clarify its critical role in immune regulation.

No conflict of interest.

ID92

Einfluss des intraoperativen Flüssigkeitsmanagements auf Komplikationen nach roboterassistierter laparoskopischer radikaler Prostatektomie: Ein Risikofaktor für Lymphozelen

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Die roboterassistierte laparoskopische radikale Prostatektomie (RARP) ist die Standardbehandlung für lokalisierten Prostatakrebs. Intraoperatives Flüssigkeitsmanagement könnte postoperative Ergebnisse beeinflussen. Es handelt sich um eine monozentrische Auswertung einer Fallserie von 285 Patienten nach RARP (2018-2021). Die Flüssigkeitsmenge wurde als normierte Dosis (ml/kg/h) und Bilanz quantifiziert und frühe postoperative Komplikationen (Anastomoseninsuffizienz, Lymphozelen) innerhalb von 30 Tagen wurden erfasst. Zusammenhänge zwischen Flüssigkeitsmanagement und Lymphozelen wurde mittels multivariabler Regressionsanalyse und Propensity-Score-Matching analysiert. Ergebnisse: Während sich keine Zusammenhänge zwischen Flüssigkeitsmanagement und höhergradigen Komplikationen oder Anastomosenleckage zeigte, war eine höhere Flüssigkeitszufuhr mit häufigerem Auftreten von Lymphozelen assoziiert ($p < 0{,}001$). Der Zusammenhang blieb im multivariablen Modell unabhängig von Kovariablen signifikant ($p = 0{,}003$). Ein Propensity-Score-Matching bestätigte die Assoziation bei Flüssigkeitszufuhr über 7,73 ml/kg/h. Ein großzügiges Flüssigkeitsmanagement während der RARP war mit mehr Lymphozelen verbunden. Intraoperatives Flüssigkeitsmanagement ist damit ein potenziell modifizierbarer Risikofaktor für Lymphozelen. Zudem ergeben diese Zusammenhänge einen Hinweis auf mögliche pathogenetische Faktoren der Entstehung von Lymphozelen.

No conflict of interest.

ID93

Klinische Erfolgsraten und Patient-Reported Outcomes einer lymphangiographischen interventionellen Sklerosierung aktiver Lymphleckagen nach radikaler Prostatektomie

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Die minimal-invasiven Behandlungsmöglichkeiten einer persistierenden, symptomatischen Lymphleckage nach radikaler Prostatektomie (RPE) sind begrenzt. Diese Studie untersucht erstmals Behandlungserfolge lymphangiographisch gestützter interventioneller Sklerosierungen (LAS) dieser Leckagen. In dieser weltweit größten Kohortenauswertung wurden 21 Patienten mit persistierender Lymphorrhoe nach Drainageneinlage nach RPE analysiert. Eine aktive Leckage wurde mittels Magnetresonanz-Lymphangiographie nachgewiesen und durch LAS behandelt. Primärer Endpunkt war der klinische Erfolg, definiert als Sistieren der Lymphorrhoe mit nachfolgender Drainageentfernung ohne Rezidiv. Zusätzlich wurden die Folgen der Intervention mittels strukturierter Patientenbefragung erfasst. In 20 von 21 Fällen (95,2 %) war die LAS klinisch erfolgreich – davon in 17 Fällen (80,9 %) nach einmaliger und in 3 Fällen (14,2 %) nach zweimaliger Intervention. Ein Patient (4,8 %) erhielt eine operative Lymphozelenfensterung. Antworten aus 17 Patientenbefragungen (80,9 %) lagen vor. Drei Patienten (17,6 %) berichteten über passagere Schmerzen, 10 (58,8 %) über eine vorübergehende Beinschwellung (Median: 3 Monate; Range: 1–12 Monate). Lymphdrainage (5/10; 50 %) und Stützstrümpfe (7/10; 70 %) kamen unterstützend zum Einsatz, führten jedoch zu keiner langfristigen Beeinträchtigung der Lebensqualität. Schlussfolgerungen: Die LAS bei persistierender Lymphleckage nach RPE weist exzellente klinische Erfolgsraten bei gleichzeitig niedriger Morbidität auf. Eine potentielle Komplikation stellt die temporäre Beinschwellung dar, die jedoch langfristig keine signifikante Beeinträchtigung der Lebensqualität verursacht.

No conflict of interest.

ID94

Sphingosine-1-phosphate receptor type 4 (S1PR4) deficiency differentially affects acute and chronic intestinal inflammation in a murine colitis

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Immunological, genetic and environmental factors contribute to the development of chronic inflammatory bowel diseases (IBD). The common pathophysiological pathway of IBD appears to be an impaired tolerance of the immune system to epitopes of commensal or pathogenic components of the intestinal flora or food components. Various immune cells have been assigned a role in these processes, and the involvement of different T cell entities and mononuclear cells has been extensively studied. Only recently, various B cell populations have been shown to be involved in the regulation of IBD development. We have recently shown that S1PR4 mediated signalling impacts peritoneal B cell migration and the development of B cell follicules in a murine knock-out model. Interestingly, FTY720, a modulator of S1P signalling, attenuates colitis development in various murine models. In this study, we investigate the role of S1PR4 in the development of acute and chronic intestinal inflammation. Acute and chronical colitis was chemically induced in s1p4-/- and wildtype (wt) C57Black/6 mice oral DSS administration. Clinical disease activity was assessed daily. At day 12 (acute model) or day 52 (chronic model), mice were sacrificed and histopathological and immunohistochemical analysis as well as analysis of the local and systemic immune response were performed. Results: While S1PR4 deficiency resulted both in a lower clinical disease severity and less pronounced histopathological changes in the model of acute colitis, s1pr4-/- animals suffered from a more severe course of disease in the chronic colitis model. In the chronic disease model, plasmatic IgA levels as well as the number of plasma cells in the intestinal wall were increased. In contrast, the number of IL-10 secreting B cells in the intestinal wall was reduced in s1pr4-/- animals. In the model of chronic colitis, there was a significant increase in local levels of pro-inflammatory cytokines. Inhibition of S1PR4 mediated signalling attenuates acute inflammation in a murine model of acute colitis, while it accentuates histopathological changes in a model of chronic intestinal inflammation. The use of S1PR4-specific agonists and antagonists in the appropriate clinical setting may thus represent a way of individually influencing the course of the disease.

No conflict of interest.

ID95

Neuroendocrine Pancreatic Tumors: Evaluation of Novel Synergistic Therapeutic Approaches with Misetionamide in Organoid Models

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Pancreatic neuroendocrine carcinoma (pNEC) is considered an aggressive malignancy with a poor prognosis. Due to their heterogeneity, these tumors are often diagnosed at an advanced, already metastatic stage. Early diagnosis and tumor classification are therefore critical for successful treatment. An interdisciplinary approach is equally essential. Surgical resection remains the only curative option; however, it is typically only feasible in early-stage disease. In advanced, inoperable cases, platinum-based chemotherapy (cisplatin or carboplatin) in combination with etoposide is the current standard of care. Severe side effects, the lack of an established second-line treatment, and the development of resistance underscore the urgent need for continued research. Misetionamide (GP-2250), an oxathiazinane compound, has demonstrated antineoplastic and antiproliferative effects in several in vitro and in vivo studies across various tumor types, particularly pancreatic adenocarcinoma (PDAC). Misetionamide induces apoptosis, inhibits tumor cell proliferation, and suppresses the transcription factor NF-κB. In addition, it targets tumor cell energy metabolism by inhibiting key enzymes of glycolysis and the citric acid cycle. In pancreatic neuroendocrine tumors, Misentionamide has thus far only been studied in combination with gemcitabine. These investigations revealed synergistic effects, suggesting that further combinations with other therapeutic agents may be promising. Patient derived Organoids (PDO) serve as a valuable tool in cancer research and drug development, as they replicate the physiology of tumors through their three-dimensional structure, heterogenic composition and growth characteristics. Several pNET organoid cultures have been established from patient-derived material. These models will be used for viability studies analysing different therapeutic concepts combining cisplatin, etoposide, and Misetionamide and, if applicable, protein-level analyses. This study represents the first investigation of Misetionamide in pNET PDOs. Foundational experiments, including Western blot analyses and flow cytometry on pNET cell lines, yielded promising results already.

No conflict of interest.

ID97

Burch colposuspension for stress urinary incontinence in women – results of a retrospective clinical trial

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Stress urinary incontinence (SUI) is a common condition affecting up to 50% of older women and 20–30% of premenopausal women, significantly impacting quality of life. While Burch colposuspension (BC) has shown long-term efficacy rates of 65–90%, up to 28% of patients (pts) experience adverse events. This study assessed BC procedures performed via mini-laparotomy (2020–2023) at University Hospital Bonn. The study aimed to determine the effect of BC for the treatment of SUI in women. Objective outcomes included a stress test and 24-hour pad usage, while subjective outcomes were evaluated using the German Pelvic Floor Questionnaire (GPFQ) and the International Consultation of Incontinence Questionnaire (ICIQ). Follow-up examinations were performed at 8-12 weeks (FU1) and at the timing of last clinical follow-up (FU2a). A study-specific questionnaire (SSQ), GPFQ and ICIQ were sent to all pts between December 2023 and May 2024 (FU2b). Secondary aims were to assess the safety of BC and identify predictors of surgical failure. Among 115 BC procedures, the domains bladder, prolapse and sexual function regarding GPFQ were significantly reduced at FU1 compared to preoperatively. 81% of pts showed improvement or cure (ICIQ) at FU2a (mean 16 months). The positive stress test rate dropped significantly (22% to 3.5%, $p < 0.05$), as did pad usage (3 to 1, $p = 0.05$) between preoperatively and FU2a. At FU2a, 15.7% had persistent SUI, 23.5% reported urge symptoms, and bladder, prolapse, and sexual function regarding GPFQ improved significantly. At FU2b (mean 22 months), 81% were satisfied, and de novo urge symptoms occurred in 3.5%. Low preoperative urethral closure pressure was linked to higher failure risk. BC is an effective treatment modality for SUI in women, offering high patient satisfaction, good short-term treatment success, and a low risk of adverse events.

No conflict of interest.

ID98

Sacropexy using the tendon of the semitendinosus muscle - 12-month follow-up of the world's first robotic-assisted operations

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Due to the increasing desire of patients and surgeons to avoid the insertion of foreign material, the demand for homologous tissue in urogynaecological operations with good long-term outcome is increasing. Between June 2022 and February 2023, the world's first robotic-assisted sacropexies for apical organ prolapse using the tendon of the semitendinosus muscle were performed. With a long-term follow-up of 12 months, the outcome of the first ten patients was examined as part of a monocentric analysis. This included the German Pelvic Floor Questionnaire as well as clinical examinations including POP-Q score (pelvic organ prolapse quantification) preoperatively, at the time of discharge and after three and 12 months postoperatively. RESULTS The median age was 55 years (range 44 - 70), the average BMI was 26 kg/m2 (range 21 - 29). Seven patients had a POP-Q score grade II (70 %), three patients grade III (30 %). None of the patients had recurrent apical prolapse at the time of surgery. There was a significant improvement in the areas of bladder function and total score of the German Pelvic Floor Questionnaire compared to three months postoperatively (3.85 vs. 1.61, p = 0.034; 12.79 vs. 3.28, p = 0.034) (Figure 1). Prolapse symptoms improved significantly between preoperative and 12 months postoperatively (4.74 vs. 0.67, p = 0.022) (Figure 1). The POP-Q score was significantly lower on discharge from hospital than preoperatively (2.2 vs. 0, p = 0.004) (Figure 2). There were no serious complications. The robotic-assisted approach is particularly helpful in patients with obesity or abdominal adhesions and, thanks to its comprehensive trocar mobility, enables good access for the various steps of the procedure, such as nerve-sparing dissection, opening of the longitudinal ligament and placement and attachment of the tendon. Robotic-assisted sacropexy using the tendon of the semitendinosus muscle is a safe and practicable surgical technique with excellent long-term results.

No conflict of interest.

ID99

Junctional Plakoglobin controls intestinal epithelial wound healing by regulating MAPK signaling

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While coordinated activity of epithelial cells is essential for mucosal homeostasis in the gut, dysregulation of cell motility is a hallmark of intestinal inflammatory and malignant disorders. Junctional Plakoglobin (JUP) is a desmosomal protein located at cell-cell junctions of epithelial cells which contributes to cell structure and tissue integrity. Evidence exists for plakoglobin controlling cell migration and proliferation in various tissues, however, knowledge about its specific role on cell motility in the gut is lacking. Analysis of tissue samples from patients suffering from inflammatory bowel disease (IBD) and colorectal cancer (CRC) demonstrated relevantly changed expression of plakoglobin. To examine the role of JUP in intestinal epithelium, a mouse strain with an inducible intestinal-specific knockout of plakoglobin (ivil-cre JUPfl/fl) was generated. While no differences were observed under basal conditions, knockout of JUP resulted in augmented mucosal healing in a biopsy-based wound assay in vivo. To further analyze cellular mechanisms, in vitro and ex vivo experiments were performed by generating murine organoids. Induced knockout of JUP in two-dimensionalized organoids resulted in significantly enhanced wound closure in scratch-wound assays. In addition, cell adhesion was significantly decreased following knockout of JUP as revealed in dispase-based dissociation assays. Geneset enrichment analyses of bulk RNA-sequencing revealed strong activation of MAPK signaling following loss of JUP in organoids. Accordingly, pharmocological inhibition of MAPK signaling abolished increased cell proliferation and migration in JUP-deficient intestinal organoids. Desmosomal plaque protein plakoglobin controls intestinal wound healing by affecting MAPK signaling. Based on that, JUP might be a novel therapeutic target for intestinal disorders.

No conflict of interest.

ID100

Blockade of the Prostaglandin-2 (PGE2) pathway inhibits the growth of PTEN deficient HNSCC tumors

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Increased PI3K signaling as a result of PIK3CA mutation or amplification or decreased expression of PTEN (phosphatase and tensin homolog deleted on chromosome 10) is one of the most common alterations in head and neck squamous cell carcinoma (HNSCC). PTEN negatively regulates PI3K signaling and its downstream effectors including (Cyclooxygenase-2) COX2. COX2 mediates the synthesis of PGE2 which contributes to immunosuppression in the tumor microenvironment. PGE2 also binds to one or more EP receptors (EP1-EP4) and promotes the growth of tumor cells via activation of EP2 and EP4. However, the role of PGE2 in PTEN-deficient HNSCC is incompletely understood. Here, we assessed PGE2 signaling in PTEN-deficient HNSCC and evaluated the effect of aspirin or TPST-1495, a dual EP2/EP4 antagonist, on the growth of PTEN knockout (KO) and PIK3CA-altered HNSCC tumors in immunocompetent mice. Our results demonstrated that aspirin selectively inhibits the growth of PTEN KO HNSCC tumors. In contrast, TPST-1495 inhibits tumor growth under all PI3K signaling conditions. Further, TPST-1495 substantially increased the anti-tumor activity of the immune checkpoint inhibitor anti-PD1. To date, there are no FDA-approved therapies for PI3K pathway-altered HNSCC. Our findings suggest that NSAIDs demonstrate anti-tumor activity in PTEN-deficient or PI3K-altered tumors whereas EP2/EP4 targeting may augment FDA-approved anti-PD1 therapy in HNSCC.

No conflict of interest.

ID101

The Influence of Ileocecal Resection on Postoperative Fibrogenesis in a Preclinical Chronic Colitis Model

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Intestinal fibrosis, defined by excess extracellular matrix (ECM) deposition, is a major complication of inflammatory bowel disease (IBD). Despite therapeutic progress, stricture rates remain high, and no antifibrotic therapies currently exist. Surgery is often required, yet fibrosis commonly recurs, highlighting the need for preclinical models that reflect clinical disease progression. A surgical IBD mouse model was established by combining dextran sulfate sodium (DSS)-induced chronic colitis with ileocecal resection (ICR). Chronic colitis was induced using three cycles of DSS (1% in cycle 1, 1.5% in cycles 2 and 3), each lasting 7 days with 7-day recovery intervals. Surgery was performed on day 8, following the first DSS cycle. Twenty-four female BALB/c mice were randomized into four groups: control, DSS-only, ICR-only, and DSS+ICR. Histological evaluation of intestinal segments (H&E and Masson's trichrome staining) was used to assess inflammation and fibrosis scored on a 0–4 scale. Collagen proportions were quantified, and mucosa-associated microbiota were analyzed using 16S rRNA sequencing. DSS-treated mice exhibited highest fibrosis scores in the distal colon (DC: 3.6 ± 0.24) compared to proximal colon (PC: 1.8 ± 0.20, $p < 0.0001$). Following ICR, fibrosis decreased in the DC (2.6 ± 0.22, $p < 0.01$) but increased in the transverse colon (TC: 3.2 ± 0.18, $p < 0.01$), indicating influence of the cecum on fibrosis progression. Collagen proportion at the anastomosis was significantly higher in DSS+ICR mice compared to ICR-only (27.1% ± 1.8 vs. 17.5% ± 1.2, $p < 0.01$). DSS-induced chronic inflammation also reduced microbial diversity and favored pro-fibrotic taxa (e.g. Escherichia/Shigella) over protective genera like Lactobacillus, with compositional shifts correlating with fibrosis severity. This model replicates key features of postoperative fibrosis and demonstrates how surgical resection and inflammation affect regional fibrotic responses and gut microbiota. It provides a valuable platform to investigate fibrosis recurrence and supports the microbiome as a promising target to reduce fibrotic complications and improve outcomes in IBD surgery.

No conflict of interest.

ID102

The impact of ATZ-DGU certification on older patients with proximal humeral fractures: A propensity score matching analysis based on health insurance data

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The certification as Centres for Geriatric Trauma DGU (ATZ-DGU) was initiated by the German Trauma Society (DGU) to address the increasing need for ortho-geriatric co-management. While there is a lot more evidence of its advantageous impact on e.g. femoral fractures, this study focuses on proximal humeral fractures (PHF). Via institutional numbers, certification data of ATZ-DGU (June 2023) provided by the German Academy of Trauma Surgery (AUC) were combined with anonymized claims data of the BARMER health insurance. All patients aged 65 years and older with inpatient coded PHF between 01/2015 – 09/2023 were included. All analyses were conducted separately for non-operatively and surgically treated patients who received surgical options such as locked plate fixation (LPF), reverse total shoulder arthroplasty (RTSA) or others. Each patient treated in an ATZ-DGU was matched with another from non-certified hospitals using 1:3 propensity score matching (PSM) adjusted for age, sex, treatment group, pre-existing level of care (LoC), fracture year and risk profile. Primary endpoints were short-term complications during primary hospital stay and long-term complications during follow-up period. In total 44,572 (median age 79 years; 84.6% female sex) were included to the study. Patient characteristics were comparable and, in most cases, primary treatment included surgery (ATZ-DGU 76.8% vs. non-ATZ-DGU 74.5%) favoring LPF (39.4% vs. 41.4%) and RTSA (30.0% vs. 26.0%). After PSM, 11,694 surgically treated patients were included for further analyses. Costs and length of stay were slightly higher in ATZ-DGU, especially in case of RTSA (all $p<0.05$). No differences could be detected for short-term endpoints (all $p>0.05$) except for slightly higher coding rates of delirium during primary hospitalization observed in ATZ-DGU (5.8% vs. 4.8%; OR 1.19; $p=0.059$). For long-term endpoints (overall survival, major adverse events, surgical complications or worsening of the LoC) no differences were observed (all $p>0.05$). Analyses did not show great differences in patient characteristics, choice of surgery or the occurrence of complications during hospital stay or later during follow-up period between surgically treated patients in ATZ-DGU compared to uncertified institutions, while costs per case were slightly higher in ATZ-DGU. Further investigations will examine short- and long-term outcomes for non-operatively treated patients.

Conflict of interest:

JK, JSS and JCK report research funding from the German Trauma Society (DGU) sponsored by Stryker, outside the submitted work.

ID103

A comparative study of the injury patterns and inflammatory response between suicidal and unintentional falls from height (in Germany)

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Patients who fall from great heights with suicidal intent present unique clinical challenges. These include delayed medical attention, masked injury patterns, severe hypothermia, and difficulties obtaining informed consent. Legal and logistical issues, such as coordination with guardians or relatives, can further delay care. These factors contribute to high complication rates, reported at up to 50%. This study aims to analyze injury patterns, inflammatory responses, and complication rates in suicidal jumpers versus unintentional falls, and to investigate correlations between jump height and injury severity. This retrospective, single-center study analyzed data from 68 patients who attempted suicide by jumping (01.01.2014–12.01.2024), and 68 cases of work-related falls from >3m as a control group. Data included demographics, injuries, treatments, and hospital stay duration. Injuries were assessed via clinical and radiological findings. Blood gas and lab analyses (CRP, WBC, lactate, pH, base excess, procalcitonin, prothrombin time) were used to evaluate inflammatory and coagulation status. During hospitalization, mortality, complication rates, transfusion needs, ICU time, and surgery counts were analyzed. The suicidal group had a balanced gender distribution (50% male/female), whereas the unintentional group was predominantly male (76.5%, p=0.002). Suicidal falls had a significantly higher mean fall height (9.61m vs. 6.14m) and injury severity score (ISS: 32.04 vs. 17.37, p<0.001). Complication rates were higher in suicidal cases (52.5% vs. 29.9%, p=0.011), with more surgeries required (3.21 vs. 1.69, p=0.016). Coagulation was more impaired in the suicidal group (prothrombin time: 74.95 vs. 89.09, p<0.001), resulting in significantly higher erythrocyte transfusion needs (4.07 vs. 0.97 units, p<0.001). Suicidal jumpers presented with more severe injuries (ISS 32.04 vs. 17.37), higher complication rates, impaired coagulation on admission, increased transfusion requirements, and more surgeries compared to unintentional fall patients. These patients are more complex to manage and require greater clinical resources. We recommend treatment at level 1 trauma centers with interdisciplinary intensive care capabilities.

No conflict of interest.

ID104

Microbiological Profiles of Patients with Acute Periprosthetic Joint Infection undergoing Debridement, Antibiotics and Implant Retention (DAIR)

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Periprosthetic joint infection (PJI) is a severe complication in arthroplasty, leading to increased morbidity, prolonged hospitalization, and revision surgeries. Débridement, antibiotics, and implant retention (DAIR) is a frequently employed strategy for acute infections to retain the prothesis. The aim of this study was to evaluate whether the presence of difficult-to-treat (DTT) pathogens and polymicrobial infections significantly influence DAIR outcome. Furthermore, this study investigates the microbiological spectrum, resistance patterns, in acute PJIs of the hip and knee which were treated with DAIR. A total of 116 patients (n=50 knees, n=66 hips) were treated with DAIR during a period of 2018 – 2022 for acute PJI. Acute PJI was defined as symptom duration below three weeks following the criteria defined by Tsukayama and Izakovicova classifications. Patients with lose implant, presence of a sinus tract/fistula, and patients with severe soft tissue impairment were excluded. Demographic data such as BMI, age, and number or prior operations were collected. We differentiated between PJI, polymicrobiological PJI (identification of more than one microorganism) and DTT PJI as previously described by Wimmer et al. (2020). In this cohort the following pathogen profiles were revealed: Culture-negative cases accounted for 11.3% of infections, while 63.8% were attributed to Gram-positive bacteria, 19.4% to Gram-negative bacteria, and 5% to fungal pathogens. Among the identified microorganisms, coagulase-negative staphylococci (CNS) were the most frequently detected, exhibiting a notable rifampicin resistance rate of 28.7% and oxacillin resistance rate of >50%. Additionally, there was no significant difference revision-free survival between patients with DTT pathogens and/or polymicrobial PJI compared to those without. In this study, CNS emerged as the most frequent pathogen with a notable rifampicin and oxacillin resistance rates. Despite microbiological variations, no significant differences in DAIR outcomes or revision-free implant survival were observed between singular non-DTT, DTT and/or polymicrobial infections, reinforcing DAIR as a viable treatment strategy for challenging microbiological profiles. These findings suggest that patient- and prosthesis-specific factors may play a crucial role in determining DAIR success, as microbiological characteristics alone did not significantly influence outcomes.

No conflict of interest.

ID105

AI-Generated Antibiotic Treatment Strategies for Acute Periprosthetic Joint Infections - A Comparative Study of AI vs. an Interdisciplinary Team of Orthopaedic Surgeons and Microbiologists

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Periprosthetic infections (PPI) are a serious complication after arthroplasty and require, in addition to surgical treatment, targeted antibiotic therapy. The aim of this study was to compare microbiological recommendations for the antibiotic treatment of PPI generated by an artificial intelligence (AI) system with those made by an interdisciplinary team (IT) consisting of microbiologists and orthopedic surgeons. Differences in recommended agents, dosages, and duration of antibiotic therapy between AI and IT were evaluated. Based on meta-analyses of the last 5 years, a cohort of 100 fictitious patients with PPI was created, reflecting the typical demographic data and pathogen profiles of such a group. Each patient profile included age, kidney function, allergies, and pathogen with corresponding antibiogram. The aim was to obtain a recommendation for definitive antibiotic therapy, including daily dosage and treatment duration (both IV and oral), based on the patient profile. These profiles were submitted to the AI systems DeepSeek (Deepseek Ltd., Hangzhou, China) and ChatGPT (OpenAI, San Francisco, USA) for recommendations. Simultaneously, the same profiles were assessed by the IT for comparison. Initial results show both overlaps and discrepancies in antibiotic selection. Particularly with multidrug-resistant pathogens and complex case scenarios, the AI's recommendations differed from those of the IT. For IV treatment of gram-negative bacteria, the AI favored 3rd-generation cephalosporins in 78% of cases, while the IT preferred Fosfomycin 5g three times daily in 89% of cases. For oral step-down therapy in Staphylococcus aureus infections, the AI and IT recommended entirely different drug classes in 100% of cases (AI: oral cephalosporins; IT: fluoroquinolones). Moreover, the AI only provided a broad treatment duration (4–6 weeks) for oral therapy, without specifying. Conclusion This study provides important insights into the potential and limitations of AI-supported decision-making models in orthopedic infectious diseases. AI systems offer ubiquitous, around-the-clock consultation, which could be especially advantageous for institutions lacking on-site microbiology support. However, the current results are still too inconsistent with those from an experienced IT, suggesting that this approach is not yet ready for clinical application. Additionally, the AI system lacks transparency regarding the sources it uses to make recommendations.

No conflict of interest.

ID106

Einfluss von Komorbiditäten und perioperativer nicht-chirurgischer Anästhesiezeit auf schwerwiegende Komplikationen nach inverser Schulterendoprothetik bei Frakturversorgung

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Die Frakturversorgung mittels inverser Schulterendoprothetik (reverse total shoulder arthroplasty, rTSA) ist ein bewährtes Verfahren zur Behandlung komplexer proximaler Humerusfrakturen, insbesondere bei älteren Patienten mit eingeschränkter Knochenqualität oder erheblichen Komorbiditäten. Trotz Fortschritten in der Operationstechnik bleiben Komplikationen häufig, wobei sowohl systemische als auch lokale Faktoren zur Morbidität beitragen. Ziel dieser Studie war es, die Rolle von Komorbiditäten und perioperativen Faktoren in der Entstehung schwerwiegender Komplikationen nach rTSA zu untersuchen. Es wurden konsekutive Patienten eingeschlossen, die aufgrund einer proximalen Humerusfraktur mit einer rTSA versorgt wurden. Erfasst wurden Informationen zu Komorbiditäten, peri- und operativen Variablen, inhospital-Komplikationen sowie Aufenthaltsdauer. Die perioperative nichtchirurgische Allgemeinanästhesiezeit (NS-GAT) wurde als die Zeit definiert, die ein Patient unter Vollnarkose verbrachte, jedoch nicht direkt mit der chirurgischen Operation verbunden war. Dies umfasst Zeitspannen für anästhesiologische Maßnahmen vor der operativen Freigabe oder nach Abschluss der Operation. Die relevanten Komorbiditäten wurden mit dem Charlson Comorbidity Index (CMI) berechnet und zusammen mit anderen Variablen analysiert. Insgesamt wurden 78 Patienten (Durchschnittsalter: 79 ± 6,9) untersucht. Komplikationen traten bei 62 % der Patienten auf, darunter 44 % schwerwiegende systemische, nicht-chirurgisch bedingte Komplikationen und 6 % schwerwiegende lokale, chirurgisch bedingte Komplikationen. Die Gruppierung nach CMI zeigte keinen Zusammenhang zwischen einem höheren CMI und Alter, Operationszeitpunkt oder Aufenthaltsdauer. Auch die NS-GAT korrelierte nicht mit dem CMI. Eine NS-GAT von über 2 Stunden zeigte keine signifikante Korrelation mit Alter, CMI oder Operationsdauer, war jedoch signifikant mit der Gesamtkomplikationsrate sowie der Rate schwerwiegender systemischer Komplikationen assoziiert ($p = 0{,}0068$; $p = 0{,}0062$). Ein Zusammenhang mit schwerwiegenden lokalen, chirurgisch bedingten Komplikationen konnte nicht festgestellt werden. Eine verlängerte perioperative nicht-chirurgische Allgemeinanästhesiezeit (NS-GAT > 2 Stunden) stellt einen signifikanten Risikofaktor für schwerwiegende systemische Komplikationen nach rTSA dar. Da dies unabhängig von Alter, Komorbiditäten oder Operationsdauer auftritt, deutet dies darauf hin, dass diese Variable stärker von der Erfahrung und Kompetenz des Anästhesieteams abhängt. Ein höherer CMI erwies sich ebenfalls als Risikofaktor für die Entwicklung sowohl systemischer als auch lokaler Komplikationen. Die Ergebnisse unterstreichen die Bedeutung einer optimierten perioperativen Planung, um die Anästhesiezeit zu reduzieren und das Risiko von Komplikationen zu minimieren.

No conflict of interest.

ID107

Bcl-xL inhibition empowers photodynamic therapy and causes a metabolic reprogramming of medulloblastoma cells in vitro

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Medulloblastoma represents one of the most common brain tumors in children. Photodynamic therapy has gained substantial interest as a therapeutic measure for brain tumors. In this study, we performed a preclinical testing of a combined treatment with 5-ALA-based photodynamic therapy (PDT) and the Bcl-xL inhibitor A-1331852 in vitro. The combination therapy was tested on established, primary cultured and stem-like medulloblastoma cells using MTT assays. BLISS analysis was performed for thorough evaluation of the nature of the interaction of both treatment modalities. Spheroids were used to examine the effects of the combination therapy in a 3-dimensional setting. Annexin V/PI staining followed by flowcytometric analysis was used to detect pro-apoptotic effects. Western blot analyses were performed to examine mechanistic effects on the molecular level. Extracellular flux analyses served at examining effects on the tumor cell metabolism. AI-based analysis was performed to examine antimigratory effects. Treatment with PDT in combination with Bcl-xL inhibition led to a predominantly synergistic anti-proliferative effect on established, primary cultured and stem-like medulloblastoma cells. The nature of the response towards this combinatorial approach was independent of baseline c-myc expression. In the 3-dimensional setting, this multi-modal therapy resulted in a significantly enhanced inhibitory effect on medulloblastoma spheroids. On the molecular level, PDT and Bcl-xL inhibition combined led to enhanced cleavage of caspases 9 and 3. On the metabolic level, the combination therapy led to a reduction in both, oxidative phosphorylation and the glycolytic rate. In line with this finding, a reduced expression of respiratory chain proteins was found. Moreover, the velocity and the total distance of migrating cells was significantly impaired by the combination treatment. PDT in combination with Bcl-xL inhibition had a predominantly synergistic inhibitory effect on the cell viability of a broad panel of medulloblastoma cells. This effect was associated with enhanced cleavage of caspases and energy depletion.

Conflict of interest:

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ID108

Comparison of hyperthermic chemotherapy and oncolytic virotherapy in in-vitro models of peritoneal surface malignancies

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Peritoneal surface malignancies (PSM) offer limited treatment options. While cytoreductive surgery (CRS) combined with hyperthermic intraperitoneal chemotherapy (HIPEC) is used for selected patients, HIPEC's role remains controversial due to inconsistent outcomes and technical variability — underscoring the need for standardized protocols and novel therapies. We aimed to evaluate the cytotoxic effects of oncolytic virotherapy and hyperthermic chemotherapy on a peritoneal cancer cell monolayer and compare them to an established real-time impedance-based 3D model of PSM [1]. We assessed the efficacy of guideline-recommended HIPEC regimens, potential improvements through treatment modifications, the feasibility of oncolytic virotherapy as an alternative or adjunct, and the combined efficacy of both treatments. Sulforhodamine B (SRB) assay. To assess cytotoxicity, OAW42 cells, established from the ascites of a patient with ovarian cystadenocarcinoma, were seeded in 24-well plates and incubated overnight. After 24 h, medium was replaced with solutions containing HIPEC-equivalent chemotherapy doses or oncolytic virus (OV). To simulate HIPEC, plates were incubated at 42 °C for 60–90 min, then medium was refreshed. After 72 h, cells were fixed for sulforhodamine B (SRB) assay. Impedance-Based Real-Time Cell Analysis (RTCA) Impedance caused by seeded cells was continuously measured using an xCelligence RTCA SP/DP device. Cells were seeded in 96-well plates and allowed to adhere for 24 h before addition of 100 µL of chemotherapy- or OV-containing solutions. MeV-SCD is a genetically modified measles OV encoding yeast cytosine deaminase plus yeast uracil phosphoribosyltransferase (SCD), allowing infected tumor cells to convert the prodrug 5-fluorocytosine (5-FC) into toxic 5-fluorouracil (5-FU), thereby enhancing tumor-specific cytotoxicity [2]. In our PSM model, cisplatin showed measurable cytotoxicity at HIPEC-relevant doses, significantly enhanced at 42 °C compared to normothermic conditions, though overall efficacy remained moderate. Oncolytic virotherapy with MeV-SCD also showed cytotoxic effects, which were markedly increased when combined with 5-FC. In upcoming experiments, our aim is to enhance treatment efficacy in our PSM models and, prospectively, in patients.

References: [1] Seyfried N, et al. Prolonged Exposure to Oxaliplatin during HIPEC Improves Effectiveness in a Preclinical Micrometastasis Model. Cancers. 2022;14(5):1158. [2] El-Sayed ASA, et al. Microbial cytosine deaminase is a programmable anticancer prodrug mediating enzyme: antibody, and gene directed enzyme prodrug therapy. Heliyon. 2022;8(9):e10660.

No conflict of interest.

ID109

Non-invasive physical plasma for the treatment of vulvar intraepithelial neoplasia

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Vulvar intraepithelial neoplasias (VIN) are precursors of vulvar cancer and are treated according their degree of severity. Mild VIN lesions (VIN I) are solely monitored if asymptomatic. Medium and severe lesions (VIN II/III) are treated surgically by laser or local excision. Due to the high recurrence rate of VIN, patients usually undergo multiple operations under general anesthesia, often resulting in scarring. Non-invasive physical plasma (NIPP) is an argon-based non-thermal physical plasma, exerting antimicrobial, pro-regenerative, and selective antineoplastic effects via reactive oxygen species. This prospective, single-center, proof-of-principle study investigates the antineoplastic efficacy of NIPP on VIN. Patients with histologically proven VIN I or II and informed consent (ethics vote Az 01/22) were included. After coating the vulva with a 5% acetic acid solution, the acetowhite lesions were treated with the Plasmajet kINPen® MED (Neoplas Med, Greifswald, Germany) over a period of one minute/cm². Local anesthesia was not required. Each treatment was accompanied by photo documentation and a description of the affected areas of the vulva. The treatment may have been repeated after one week. After three months, a follow-up colposcopy was performed in which a biopsy of the treated vulvar area was taken. 25 patients (as of May 2025) received the NIPP treatment, 17 diagnosed with VIN I and eight with VIN II. 15/25 (60%) were found to be VIN negative following NIPP treatment, two of them were administered NIPP twice. 10 patients remained VIN positive, following a single NIPP treatment; however, two of these patients exhibited an improvement in their findings, with a shift from the original VIN II to VIN I. The therapeutic intervention was well-tolerated, exhibiting only minimal adverse effects, no pain and no scarring. A common side effect was the short-term dryness of the treated area, which could be treated well with greasy ointments. In 60% of patients, VIN could no longer be detected histologically after NIPP treatment. NIPP has the potential to eliminate the necessity of general anesthesia in the treatment of VIN, thereby enabling patients to resume their daily lives without restrictions. Furthermore, this treatment prevents tissue damage and scarring. Assuming the treatment of VIN I and II proves to be effective, the treatment of VIN III (usual type) could also be considered in the future.

No conflict of interest.

ID110

Novel method for the rapid generation of antibiograms in periprosthetic joint infection-derived bacteria using Scattered Light Integrated Collector Technology

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Bacterial antibiotic resistance is a key challenge in modern clinical medicine. Musculoskeletal infections, as the periprosthetic joint infection (PJI), increasingly often present with multiresistant causative microbes. Current microbiological gold-standard methods to identify the infecting species and their antibiotic treatability take two days to two weeks. This long period of diagnostic uncertainty prolongs empirical and potentially untargeted treatment of patients. Here, we saw the opportunity to establish a faster, while equally sensitive method to deliver antibiotic susceptibility profiles using Scattered Light Integrated Collector (SLIC) technology. We selected panels of antibiotics that cover most commonly encountered bacteria in PJI and further allow for MRSA- and MRGN-classification. By challenging bacteria isolated from PJI-patients with these panels, we validated SLIC´s ability to monitor bacterial growth and its antibiotic inhibition accurately and reproducably within minutes. SLIC could show the dose-dependency and bacteriostatic or -lytic effect of multiple antibiotic classes in real time. This method allowed us to identify the class of infective microbe and to generate antibiotic susceptibility profiles for the tested species within 90 min. This new approach presents the opportunity to enhance clinical outcome through rapid and precise diagnostic information on identity and treatability of an infecting microbe.

No conflict of interest.

ID111

Ein neuartiger Ansatz für die Gewebeanalyse bei Gelenkinfektionen mit dem „Scattered Light Integrated Collector“ (SLIC)

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Totalendoprothese-Verfahren gehören zu den führenden Operationen der Industrienationen und nehmen im Rahmen des demographischen Wandels weiter zu. Die Rate der gefürchteten Komplikation eines periprothetischen Infektes (PJI) liegt bei 1-3 % und stellt Mediziner und Patienten vor große Herausforderungen. Eine Zusammenschau vieler Kriterien ist für die zuverlässige Diagnose erforderlich und benötigt durch mikrobiologische Kultur-Anlage ca. 7-14 Tage. Neue Verfahren für die Einschätzungen eines fraglichen Infektionsstatus werden dringend benötigt, um Therapieentscheidungen schnell und adäquat zu treffen. In diesem Kontext entwickelten wir ein Protokoll, das Gewebeproben aus Revisionsoperationen von PJI-Patienten in einem neuen, Laser-basierten Verfahren, namens „Scattered Light Integrated Collection“ (SLIC), untersucht. Das Gerät kann durch Quantifizierung von gestreuter Laserenergie Bakterienwachstum in Echtzeit nachweisen. In einem ersten Schritt gelang es uns für SLIC drei verschiedene Bewertungskriterien für Bakterienwachstum zu etablieren und mit ihnen, durch die Mikrobiologie verifiziert-infizierte Proben innerhalb von fünf Stunden als solche zu erkennen. Im Rahmen der Etablierung widmeten wir uns der fraglichen Notwendigkeit einer Proben-Antikoagulation, dem Einfluss einer intermittierenden Kryokonservierung verarbeiteter Gewebeproben für sekundäre Labortests, dem Optimieren von Probenmenge und Nährstoffangebot und der zusätzlichen Nutzung chemischer und mechanischer Homogenisationsverfahren. Mit SLIC erzielten wir innerhalb von 5 Stunden, bei vorheriger mechanischer Disruption der Gewebeprobe, den Nachweis von Bakterienwachstum und konnten dies durch Auswahl geeigneter Medien weiter signifikant erhöhen. Zudem konnten wir zeigen, unter welchen Umständen intermittierende Probenlagerung ohne die Dezimierung bakteriellen Wachstums möglich ist. Zusammenfassend stellt diese Studie ein einfaches und schnelles diagnostisches Verfahren zur Erkennung von Gelenkinfektionen anhand von Gewebebiopsien vor. Unser erarbeitetes SLIC-Protokoll erlaubt auch eine Untersuchung von hemmenden Einflüssen z.B. ausgewählter Antibiosen und ermöglicht damit die Durchführung von Resistenzbestimmungen einzelner PJI-Pathogene.

No conflict of interest.

ID112

Prolonged inhibition of tumor cell proliferation after short term starvation (STS)

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Due to their high proliferation rate, tumor cells have a high energy demand. Part of their energy for proliferation is generated by aerobic glycolysis (Warburg effect). The aim of this study was to analyze nutrient requirements in relation to cell proliferation in a stable cell culture model of tumor cells. We used HeLa cells which were subjected to STS by reduction of various nutrient sources such as glucose, glutamine, pyruvate and fetal calf serum (FCS). Cell proliferation was analyzed by counting with a CASY counter (Omni life science) or by a cellcyte microscope (ECHO). Activation of signaling pathways was performed by western blotting analysis. Extracellular acidification rate (ECAR) and Oxygen consumption rate (OCR) were analyzed with a seahorse instrument (Agilent). Cell division rate was significantly reduced even 5 days after STS with 0.1 mM glucose for 24 hrs. Reduction of FCS from 10 to 1 % had a similar effect. The tumor cells had a lower OCR as well as ECAR after reduction of glucose from 5 to 1 mM and FCS from 10 to 1 %. After inhibition of ATP synthase with oligomycin A, tumor cells cultivated under control conditions reduced their OCR to the level of cells cultivated with STS conditions. Additional inhibition of mitocondrial complexes I by Antimycin A and III by rotenone further reduced the OCR of tumor cells under control conditions, but not tumor cells cultivated with STS. ECAR increased significantly in both treatment groups after inhibition of ATP synthase. Reduction of glucose concentration to 0.1 mM significantly increased caspase 8 protein 24 hrs after initiaton of STS. 1 to 4 days after recovery from STS, caspase 8 protein concentration returned to ist baseline activity. Under 0.5 and 0.1 mM glucose, caspase 9 protein was also significantly increased. Glucose concentration of 0.5 and 0.1 mM increased active caspase 3 significantly. During recovery from STS, MAPK 14 activity was significantly increased. Even after 1 day of STS, cell proliferation and signalling pathways are significantly altered for several days indicating strong vulnerability of tumor cells after changes in energy supply.

No conflict of interest.

ID113

Intraoperative Utilization of Laser Speckle Contrast Imaging (LSCI) in Direct -to-Implant Breast Reconstruction Following Mastectomy - a Single Center Observational Study

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Direct-to-implant breast reconstruction represents an increasingly preferred reconstructive procedure in the surgical treatment of patients with breast cancer undergoing mastectomy. Preservation of blood perfusion of the skin is a critical factor regarding perioperative complications. Currently, the clinical subjective assessment of skin perfusion by the surgeon remains the primary method for evaluating tissue perfusion intraoperatively. Indocyanine green (ICG) angiography represents one promising method of intraoperative visualisation of skin perfusion. However, due to various economic and medical obstacles, it has not yet been adopted into routine clinical care. Laser speckle contrast imaging (LSCI) provides an alternative, continuous and non-invasive approach. This observational study investigates the intraoperative utilization of LSCI in the context of direct-to-implant breast reconstruction following mastectomy. LSCI was performed at specific perioperative time points (preoperatively, after mastectomy, after sizer insertion, after implant insertion and 48 hours postoperatively). Perfusion was recorded in perfusion units (PU). Perfusion changes, perfusion homogeneity and known clinical risk factors were correlated with the event of perioperative complications. In total n=52 patients were enrolled in the study comprising n=31 unilateral and n= 21 bilateral surgical procedures resulting in n=73 breast reconstructive surgical procedures including n=37 cases of nipple-sparing mastectomy (NSM) and n=12 cases of skin reduction mastectomy with pre-pectoral direct-to-implant breast reconstruction, respectively. Additionally, n=20 cases of implant replacement and n=4 implant removals were included. The rate of major complications requiring revision surgery was 9.5%, and the rate of minor complications was 47.9%. Overall, there was a reduction in skin perfusion relative to the preoperative status during surgery, with the lowest values obtained at the time of sizer implant insertion. A recovery of perfusion to baseline levels was observed in the postoperative course. The perfusion change was not associated with the probability of perioperative complications. Heterogeneous breast perfusion in the postoperative period, measured by PU difference and PU ratio, was significantly associated with the occurrence of perioperative complications (PU-difference: Odds ratio (OR)= 1,021; p=0.042; PU-ratio: OR= 5,361; p=0,001). This non-interventional observational study demonstrates the high feasibility of LSCI in the intra- and postoperative course of direct-to-implant reconstructive breast surgery. In particular, real-time perfusion monitoring holds considerable potential to be incorporated into the intraoperative decision-making process of the surgeon, and may help to prevent perfusion-related complications.

No conflict of interest.

ID114

Activation of tumor-draining lymph nodes in esophago-gastric adenocarcinoma resistant to chemo- or radiotherapy

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The majority of patients with esophago-gastric adenocarcinoma (EGA) present with locally advanced or metastatic disease at first diagnosis. Multimodality therapies including surgery and neoadjuvant radio-chemotherapy (CROSS) or perioperative chemotherapy (FLOT) are the standard of care with recent data demonstrating superiority of FLOT. Despite the overall benefit of these treatment regimens, a relevant proportion of patients does not respond. Addition of anti-PD(L)1 treatments to the multimodality protocols of EGA appears promising and is already approved in specific situations. Combined immunotherapy in FLOT-non-responders was inferior to continuation of FLOT (Vestige-trial). This result was surprising and to better understand mechanisms of resistance and factors determining susceptibility to immunotherapy, we aim to elucidate the immune microenvironment from patients, which are resistant to CROSS or FLOT. Functionally, tumor-draining lymph nodes (TDLN) are part of the extended tumor microenvironment. We selected 128 patients who underwent surgery for EGA in a multimodal setting at the University Hospital Cologne. The activation status of TDLN (lymph node station 7, 8, 9 and lymph nodes from the lesser curvature) was defined based on presence of secondary follicles and sinus histiocytosis visible on H&E stainings of FFPE slides. When comparing multiple lymph nodes from the same patients, a complete consistency of lymph node activation was observed in 80% of FLOT and 67% of CROSS-treated patients, respectively. 109 samples from patients with >50% residual tumor cells following CROSS (n=25) or FLOT (n=84) were included in this study. Patients treated with FLOT had significantly more activated lymph nodes than patients treated with CROSS. 93% of FLOT-treated patients had activated lymph nodes in comparison to only 48% of CROSS-treated patients ($p<0.01$). The activation in TDLN of CROSS patients was even lower in patients with <50% residual tumor cells. Analyses of samples from CROSS patients receiving adjuvant Nivolumab are ongoing and will be included in the presentation. In contrast to a proposed synergism of radiotherapy and immune checkpoint inhibition, activation of tumor-draining lymph nodes appears to be higher in patients treated with chemotherapy. Deeper insights into the immune composition of resistant tumors will provide important rationales for tailored treatment strategies and hopefully superior outcomes in this very challenging patient cohort.

No conflict of interest.

ID115

pHSP27 represents a potential mechanism of resistance against CUSP9v3 in medulloblastoma

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Medulloblastoma represents one of the most common brain tumors in children. We previously observed that the drug repurposing approach CUSP9v3 has a strong anti-neoplastic activity against medulloblastoma cells in vitro. In this study, we identified phosphorylation of HSP27 as a potential mechanism of resistance and performed preclinical testing of a combined treatment with suboptimal doses of CUSP9v3 and pharmacological inhibitors of HSP27 in vitro. The combination therapy was tested on established and primary cultured medulloblastoma cells using MTT assays. BLISS analysis was performed for thorough evaluation of the nature of the drug-drug interaction. Spheroids were used to examine the effects of the combination therapy in a 3-dimensional setting. Annexin V/PI staining followed by flowcytometric analysis was used to detect pro-apoptotic effects. Western blot analyses and knockdown experiments with siRNA were performed for molecular analysis. Extracellular flux analyses served at examining effects on the tumor cell metabolism. Treatment with CUSP9v3 at reduced dosage in combination with HSP27 inhibition led to a predominantly synergistic anti-proliferative effect on medulloblastoma cells showing hyperphoshorylation of HSP27 in response to treatment with CUSP9v3. In the 3-dimensional setting, the combination treatment resulted in a significantly enhanced inhibitory effect on the growth of medulloblastoma spheroids. On the molecular level, simultaneous treatment with CUSP9v3 and inhibition of HSP27 led to enhanced cleavage of caspase 3. On the metabolic level, the combination therapy led to a significant reduction in oxidative phosphorylation (oxphos) in primary cultured medulloblastoma cells. Treatment with CUSP9v3 leads to enhanced phosphorylation of HSP27 across a variety of medulloblastoma cell models. Inhibition of HSP27 in combination with CUSP9v3 leads to a predominantly synergistic inhibitory effect on the cell viability of a broad panel of medulloblastoma cells in 2D- and 3D-settings. On the metabolic level, this combination treatment is associated with inhibition of oxphos.

Conflict of interest:

Research grant from Novocure

ID116

Management von Komplikationen im oberen Gastrointestinaltrakt nach externen Primäreingriffen – Eine prospektive Analyse eines zertifizierten, universitären High-Volume-Zentrums

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Die Krankenhauszentralisierung und die Implementierung von Mindestmengen sind zentrale Begriffe der Gesundheitspolitik. Seit 2021 fordert der Gemeinsame Bundesausschuss Mindestmengen für planbare komplexe Operationen. Die Übergangsregelung zum Erreichen von Mindestmengen endete 2023, sodass fortan eine jährliche Mindestmenge von 26 Eingriffen am Organsystem Ösophagus pro Standort eines Krankenhauses erforderlich sind. Es stellt sich die Frage, welchen Einfluss Mindestmengen auf die Versorgungsqualität in Low-Volume-Zentren haben und welche Rolle zertifizierte High-Volume-Zentren in der Weiterbehandlung von Komplikationen übernehmen. In die prospektive Single-Center-Studie wurden Patient:innen eingeschlossen, die im Zeitraum vom 01.01.2023 bis zum 31.12.2024 extern eine komplikativ verlaufende Operation, Intervention oder Diagnostik im Bereich des oberen Gastrointestinaltraktes erhielten und für die Weiterbehandlung an die Klinik und Poliklinik für Allgemein-, Viszeral-, Thorax- und Transplantationschirurgie der Uniklinik Köln als zertifiziertes nationales Exzellenzzentrum im Bereich des oberen Gastrointestinaltraktes verlegt wurden. Im Beobachtungszeitraum wurden an der Uniklinik Köln 39 Patient:innen (38,5% männlich, 61,5% weiblich; Durchschnittsalter: 68,1 Jahre) nach extern komplikativ verlaufenden Primäreingriffen bei maligner oder benigner Grunderkrankung behandelt. Die führenden Komplikationen waren Perforationen, Nahtinsuffizienzen sowie inkomplette Resektionen oder Rekonstruktionen. Nach Auftreten von Komplikationen erfolgte in 15 Fällen eine direkte Zentrumsverlegung. Bei 24 Patient:innen wurden extern Revisionsoperationen und/oder endoskopische Therapien durchgeführt. Zum Zeitpunkt der Übernahme waren 71,8% der Patient:innen intensivpflichtig. Nach Zentrumsverlegung wurden bei 27 Patient:innen kumulativ 115 Operationen durchgeführt. Bei 37 Patient:innen erfolgten insgesamt 243 ÖGDs mit 171 EndoVAC-Wechseln. Nach Stabilisierung des Gesundheitszustandes konnten 25,6% der Patient:innen heimatnah verleget und 61,5% in die Häuslichkeit entlassen werden. Die Mortalität lag bei 12,8%. Es lässt sich schlussfolgern, dass die Weiterbehandlung von Patient:innen mit extern komplikativ verlaufenden Primäreingriffen einen hohen Bedarf an personellen, logistischen und medizinischen Ressourcen aufweist. Dies zeigt sich insbesondere an den erforderlichen Kapazitäten für eine umfangreiche Diagnostik, komplexe operative Versorgung und intensivmedizinische Betreuung.

No conflict of interest.

ID118

Association Between Insulin Surrogates and Esophageal Cancer Risk: Findings from a Prospective UK Biobank Cohort Study

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Insulin resistance has been proposed as a potential marker for predicting gastrointestinal cancers. Esophageal cancer, in particular, warrants attention due to its increasing incidence in recent decades, especially in Western countries. This study aimed to examine the relationship between several insulin resistance-related indicators—including the triglyceride-glucose (TyG) index, TyG combined with body mass index (TyG-BMI), the triglyceride to high-density lipoprotein cholesterol ratio (TG/HDL-C), and the metabolic score for insulin resistance (METS-IR)—and the risk of developing esophageal cancer. The UK Biobank holds health and lifestyle information from more than 500,000 individuals. For this analysis, data from 388,900 participants collected between 2006 and 2010 were utilized. The study employed Fine-Gray competing risk models, restricted cubic spline (RCS) analysis, and receiver operating characteristic (ROC) curves to evaluate the relationship between four surrogate markers of insulin resistance and the likelihood of developing esophageal cancer, with a focus on esophageal adenocarcinoma (EAC) and esophageal squamous cell carcinoma (ESCC). A decade following initial enrollment, 0.16% (95% CI: 0.11–0.26%) of UK Biobank participants had been diagnosed with esophageal cancer, and 4.17% (95% CI: 3.86–4.46%) had died. An increase of one standard deviation in the TyG index, TyG-BMI, TG/HDL-C ratio, and METS-IR was associated with a higher risk of esophageal adenocarcinoma (EAC), with hazard ratios (HRs) of 1.16, 1.37, 1.08, and 1.36, respectively (all $P < 0.05$). In contrast, the risk of esophageal squamous cell carcinoma (ESCC) decreased with HRs of 0.80, 0.67, 0.77, and 0.65 for the same markers. Restricted cubic spline (RCS) models indicated that these associations were predominantly nonlinear ($P < 0.05$). Among the indicators assessed, METS-IR demonstrated the strongest diagnostic performance based on ROC curve analysis. The four insulin resistance markers—TyG index, TyG-BMI, TG/HDL-C ratio, and METS-IR—were positively correlated with the risk of esophageal adenocarcinoma (EAC) but showed inverse associations with esophageal squamous cell carcinoma (ESCC). Among them, METS-IR demonstrated superior predictive and diagnostic performance for both EAC and ESCC. This suggests that METS-IR could serve as a valuable tool for early identification of individuals at elevated risk for esophageal cancer, thereby enhancing risk stratification strategies.

No conflict of interest.

ID119

Sigmoid diverticulitis- do we follow the rules? Adherence to the guideline in a single German centre

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The German S3 guidelines for sigmoid diverticulitis are comprehensive. The algorithm for treatment is clear and reasonable and dependent on classification (classification of diverticular disease, CDD). However, often patients are not treated according to the guidelines and this might lead to disadvantages for the patients and costs for the health system. The present study analyses the adherence to the actual S3 guidelines in a single German centre. This is a retrospective, single-center clinical study. As part of a current ethics application, relevant clinical patient data was collected and summarized. The primary outcome measures are adherence to guidelines (yes/no) and under- and overtreatment. Results: The total cohort consisted of 234 patients of whom 54.7% were female. Mean age was 61.07 years. 23.5% of the patients had CDD 1A, 25.6% had 1B, 12.4% had 2A, and 2.6% 2B. Concerning the treatment 68.1% of the patients received antibiotic therapy, 17.8% were treated surgically, 8.9% received a drainage treatment, and 1 patient (0.5%) was treated with combination therapy. Analysis showed that a relevant part of the patients was overtreated. The present data suggests that overtreatment of diverticular disease is frequent and may lead to relevant cost for the health system. The reasen for this is unclear although we assume, that patients will and expectations from the GP might be responsible. The study is limited by number of patients but also in regard to the setting, as only patients from the Emergency Department were considered.

No conflict of interest.

ID121

Clioquinol inhibits angiogenesis by promoting VEGFR2 degradation and synergizes with AKT inhibition to suppress triple-negative breast cancer vascularization

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Angiogenesis inhibition, either as monotherapy or in conjunction with other treatments, holds significant promise in cancer treatment. However, the limited efficacy of clinically approved anti-angiogenic agents underscores the urgent need for the development of novel drugs and therapeutic strategies. In this study, we investigated the anti-angiogenic effects of clioquinol, a topical antifungal and antibiotic agent, and assessed its potential synergy with AKT inhibition in triple-negative breast cancer (TNBC). Methods Cell viability, death and proliferation were analyzed by means of water-soluble tetrazolium salt-1 assay, lactate dehydrogenase assay and bromodeoxyuridine assay, respectively. Moreover, the effects of clioquinol on the migration, tube formation and sprouting activity of endothelial cells (ECs) were assessed in a panel of in vitro angiogenesis assays and further validated by ex vivo aortic ring assays and in vivo Matrigel plug assays. Mechanistic studies were conducted using Western blotting, quantitative real-time PCR and cell-free kinase assays. TNBC growth and vascularization were evaluated in vivo by implanting murine 4T1 cell spheroids into the dorsal skinfold chambers of Balb/c mice treated with vehicle, clioquinol (30 mg/kg; i.p.; once daily), the AKT inhibitor MK-2206 (80 mg/kg; i.p.; every two days), or their combination (n=10 per group). Data are presented as means ± SEM, with statistical significance defined as $p < 0.05$. In vitro, clioquinol preferentially reduced EC viability within the tumor microenvironment. At non-cytotoxic concentrations, it significantly suppressed EC proliferation, tube formation and spheroid sprouting. These anti-angiogenic effects were confirmed in ex vivo and in vivo angiogenesis models. Mechanistic studies revealed that clioquinol directly binds to the ATP-binding site of vascular endothelial growth factor receptor 2 (VEGFR2), promoting its degradation through both proteasome and lysosome pathways. Additionally, combination treatment with MK-2206 synergistically boosted the anti-angiogenic efficacy of clioquinol in vitro and in the in vivo dorsal skinfold chamber model, leading to the suppression of TNBC growth. Our findings support the potential of clioquinol to be repurposed as an anti-angiogenic agent for the treatment of TNBC, either as monotherapy or in combination with AKT inhibitors.

No conflict of interest.

ID122

When Is FAST Positive? In-Vivo Evaluation of Abdominal Fluid Detection Thresholds During Sequential Fluid Instillation

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The focused assessment with sonography in trauma (FAST) is a standard component of the diagnostic algorithm for severely injured patients, as outlined in the German S3 guidelines. According to the 2021 TraumaRegister DGU annual report, 82% of trauma patients undergo an eFAST examination during the primary survey. While the pooled sensitivity and specificity of FAST are 74% and 98%, respectively, the specific volume of intraabdominal fluid necessary to yield a positive FAST result remains unclear. In this in-vivo study, we investigated the minimum volume of free intraperitoneal fluid required to produce a positive FAST result. Between November 2020 and April 2023, we recruited 93 adult patients undergoing elective laparoscopy. In 43 cases, the full FAST protocol was implemented, yielding 35 evaluable datasets. After laparoscopic access and exclusion of peritoneal adhesions or injuries, baseline ultrasound images of the Morison's, Douglas, and Koller pouches were acquired. Saline (NaCl 0.9%) was then sequentially instilled starting with 250 ml, 500 ml, 1000 ml and up to 1500 ml, with ultrasound reassessments performed after each step. In total, 700 images were collected for analysis. No free fluid was present prior to instillation. FAST sensitivity increased with volume: 22.9% at 250 ml, 68.6% at 500 ml, 94.3% at 1000 ml, and 100% at 1500 ml. Detection rates varied by pouch and scanning technique. The Morison's pouch showed the highest detection rate at 1500 ml (77.1%), while the Koller pouch remained negative in 62.9% of cases. Scanning orientation also influenced sensitivity: longitudinal scanning of the Douglas pouch yielded higher detection rates than transverse alone. Combining both views significantly improved diagnostic yield. Subgroup analysis revealed significantly higher sensitivity in patients with BMI <30 kg/m² ($p = 0.037$) in the Douglas longitudinal view. Neither prior abdominal surgery nor gender had a statistically significant impact. Our findings demonstrate that FAST sensitivity is strongly volume- and technique-dependent. Even large volumes (1500 ml) can remain undetected. Every positive FAST should trigger rapid diagnostic and therapeutic steps, yet negative findings warrant caution. Repeat imaging or alternative diagnostics should be considered in deteriorating patients, as the absence of sonographic fluid does not rule out significant pathology. This abstract is part of doctoral theses of. A. N.

No conflict of interest.

ID124

Multicenter Identification and Validation of a Low-Abundance serum miRNA Panel for Pancreatic Cancer Detection with Cross-Disease Diagnostic Potential

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Pancreatic cancer stands out as a highly lethal disease, progressing swiftly with few clear early signs, making prompt detection exceedingly difficult. There is currently no reliable screening method available to identify this cancer at an early stage. Circulating serum microRNAs (miRNAs), particularly those found at low levels, have recently emerged as stable and tissue-specific biomarkers for early diagnosis. In this extensive multicenter investigation, 4155 participants—patients with pancreatic cancer as well as healthy controls—were enrolled from four separate institutions. The data on nucleic acids were gathered using several platforms, including RNA sequencing (RNAseq), miRNA arrays, and RT-qPCR. To correct for discrepancies caused by differences in data collection, batch effects were removed. Three distinct machine learning approaches were then applied to isolate informative features from the miRNA expression profiles in serum samples. To further improve robustness, shared features were identified by integrating data from both serum and plasma samples. The validity and reproducibility of the discovered miRNA markers were confirmed using additional serum samples collected prospectively. Seven different machine learning models were utilized to evaluate the diagnostic performance of the final miRNA panel, which was compared with the conventional tumor marker CA19-9. The panel's generalizability was also assessed in other gastrointestinal cancers. This analysis highlighted three significantly elevated miRNAs—hsa-miR-X, hsa-miR-Y, and hsa-miR-Z—as key candidate biomarkers. The panel achieved diagnostic accuracies of 87.9% in the test group and 77.9% in an external validation group, surpassing the performance of CA19-9 (88.9% vs. 75.3%). Furthermore, it distinguished pancreatic cancer from pancreatitis with an accuracy of 86.6%. The panel also exhibited high diagnostic precision for other gastrointestinal cancers: 86.4% for esophageal squamous cell carcinoma, 88.7% for gastric adenocarcinoma, and 87.4% for colorectal cancer. In conclusion, this serum-derived miRNA panel presents a promising tool for the early detection of pancreatic cancer and shows potential for broader application in detecting other digestive system malignancies. As a non-invasive diagnostic strategy, this panel could play an important role in improving early diagnosis and differentiating between similar gastrointestinal diseases.

No conflict of interest.

ID126

Patient-derived organoid models to give insight into the phase transition of MAFLD/ MASH and cirrhosis

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Fatty liver disease affects over 25% of the global population, making it one of the most common diseases. This study aims to characterize advanced patient-derived organoids, with a focus on the phase transition between healthy, metabolic dysfunction-associated steatotic liver disease (MASLD)/ metabolic dysfunction-associated steatohepatitis (MASH), and cirrhosis. Materials and Methods Patient-derived organoids were cultured using the following procedure: First, tissue samples were collected after patients provided their informed consent. Next, the tissue was digested, and the liver cells were cultured in a three-dimensional matrix using Geltrex. The organoids were allowed to grow for at least one week before measurements began. Growth kinetics and the shape of each organoid line (healthy, MASLD/MASH, cirrhosis) were monitored. Immunohistochemistry (IHC) and multiplex analyses were conducted. Furthermore, a computational growth model focusing on cell proliferation and apoptosis was established. Results and Discussion Organoids from a cohort of at least 20 different patients, divided into healthy, MASLD/MASH, and cirrhosis, were successfully cultured. Each patient-derived organoid had its own growth kinetics. We classified each organoid line using immunohistochemistry and multiplex analysis with a pattern of five antibodies (Ki-67, Albumin, HNF4, CK19, and LGR5+) to reveal their composition and biological characteristics. We successfully integrated experimental data, growth kinetics, immunohistochemistry, and multiplex analysis into computational models. We successfully cultivated organoids derived from various stages of fatty liver disease and elucidated their structural differences. Using advanced computational modeling, our investigation analyzed the growth dynamics of organoids corresponding to MASLD/MASH and cirrhosis. This collaborative integration of experimental and computational approaches presents promising avenues for further developing organoid studies on fatty liver disease.

No conflict of interest.

ID127

Carvacrol targets angiogenesis and vasculogenic mimicry in triple-negative breast cancer by blocking the TRPM7/Zn^{2+}/mTOR/RTKs signaling pathway

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Vasculogenic mimicry (VM) contributes significantly to tumor aggressiveness and resistance to anti-angiogenic therapies. Simultaneous inhibition of both angiogenesis and VM represents a promising strategy to improve therapeutic outcomes in aggressive cancers, such as triple-negative breast cancer (TNBC), which respond poorly to anti-angiogenic therapies. In this study, we investigated the effects of carvacrol, a natural monoterpene phenol widely used as a food additive, on angiogenesis and VM, elucidated its underlying molecular mechanisms, and evaluated its therapeutic potential in TNBC. The anti-angiogenic effects of carvacrol on endothelial cells (ECs) were evaluated through a panel of in vitro angiogenesis assays, an ex vivo aortic ring assay, and an in vivo Matrigel plug assay. Its effects on VM were assessed by means of tube formation assays in several types of TNBC cell lines, including MDA-MB-231, HCC1937, and 4T1. Mechanistic studies were performed via Western blotting and quantitative real-time polymerase chain reaction (qRT-PCR). Additionally, a mouse dorsal skinfold chamber model of murine 4T1 tumors (n=7) and an orthotopic xenograft model of human MDA-MB-231 tumors (n=7) were employed to evaluate the effects of carvacrol on TNBC vascularization, growth, and metastasis. All values were expressed as means ± SEM. Statistical significance was accepted for a value of $p < 0.05$. Carvacrol preferentially inhibited angiogenesis in ECs and VM in TNBC cells at concentrations that exerted only modest effects on TNBC cell proliferation. Mechanistic investigations revealed that carvacrol antagonizes transient receptor potential melastatin 7 (TRPM7) and reduces intracellular Zn^{2+} influx, leading to down-regulation of mammalian target of rapamycin (mTOR) phosphorylation. This, in turn, promoted the proteasomal and lysosomal degradation of key receptor tyrosine kinases (RTKs), including vascular endothelial growth factor receptor 2 (VEGFR2), Tie2, fibroblast growth factor receptor 1 (FGFR1), and insulin-like growth factor 1 receptor (IGF1R) in ECs, as well as FGFR1 and IGF1R in TNBC cells. In vivo, daily intraperitoneal injections of 50 mg/kg carvacrol effectively suppressed TNBC vascularization, growth, and metastasis in the mouse dorsal skinfold chamber model and orthotopic xenograft model. Carvacrol preferentially targets angiogenesis and VM in TNBC by suppressing the TRPM7/Zn^{2+}/mTOR/RTKs axis, highlighting its potential as a novel therapeutic candidate for TNBC and potentially other tumors resistant to anti-angiogenic therapies.

No conflict of interest.

ID128

Hyperspektralanalyse- Potenzial als Standarddiagnostikum in der Wundmedizin?

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Wenn bei Menschen mit peripherer arterieller Verschlusskrankheit (pAVK) das Stadium der (chronisch) kritischen Extremitätenischämie (CLI) vorliegt, ist die adäquate, zeitnahe Revaskularisierung die Grundlage jeder weiteren Therapie einer gegebenenfalls vorliegenden Gewebeläsion. Standardmäßig erfolgt die Erfolgskontrolle eines solchen Eingriffs mittels Dopplerverschlussdruckmessung, Duplexsonographie sowie in Ausnahmefällen Schnittbildgebung. Mit diesen Verfahren lässt sich zuverlässig die Makroperfusion bis in den Hohlfußbogen darstellen. Doch selbst wenn diese adäquat gewährleistet ist, ist es häufig schwierig, darüber Rückschlüsse auf die Mikroperfusion des Gewebes zu ziehen. Eine bisher etablierte Methode, die diese Mikroperfusion zumindest auf oberflächlichem Hautniveau abbildet, ist die transcutane Sauerstoffpartialdruckmessung (tcpO2). Diese kann jedoch technisch bedingt keine ortsgenaue Aussage (z.B. Zehenkuppen) über die Perfusion treffen und vor allem nicht über die eigentlich relevante Perfusion auf Kapillarebene. Diese ist jedoch relevant, wenn z.B. die Abheilungstendenz von Läsionen beurteilt werden soll. Hier kann die Hyperspektral-Bildgebung (Hyperspectral imaging, HSI) hilfreich sein. Dennoch ist aktuell noch kaum etwas über eine mögliche Anwendung als Standarddiagnostikum bekannt. Entsprechend führten wir zunächst eine orientierende Probandenstudie durch, hierbei wurde eine standardisierte Minderperfusion im Bereich der Hand gesunder Probanden durch die Anlage einer Blutsperre durch. Hierbei konnte der gleichgerichtete signifikante Abfall der oberflächlichen (StO2) sowie tieferen (kapillare Ebene, NIR) Perfusion sowie der entsprechende gleichgerichtete Anstieg in der Reperfusions-Hyperämie dargestellt werden, zudem konnten Normalwerte definiert werden. Darauf aufbauend erfolgt eine (noch laufende) Studie zur Evaluation der Mikroperfusion bei pAVK (CLTI) Patient:innen. Hierbei erfolgt jeweils prä- und postoperativ die Messung der Hyperspektralanalyse in Kombination mit der tcpO2 und dem ABI (als etablierte Referenzmethoden). Hierbei zeigten sich erwartungsgemäß die postoperativen ABI als auch die tcpO2-Werte (in den Zwischenanalysen signifikant) zum präoperativen Ausgangswert erhöht. Aber auch die mit der Hyperspektralanalyse dargestellte Perfusion auf kapillarer Ebene zeigte sich insbesondere im Stadium 3 postoperativ (in den Zwischenanalysen signifikant) verbessert. Auch Aspekte wie die postoperative Ödembildung können objektiviert werden. Zusammenfassung: Die Technologie stellt eine nützliche Ergänzung der Diagnostik insbesondere bei Diabetikern und in Bezug auf Amputationswunden dar, da insbesondere tiefere Gewebeschichten diskriminiert werden können. Der klinische (auch intraoperative) Einsatz zeigt sich unproblematisch, schnell und gut standardisierbar. Mit der aktuell laufenden Studie hoffen wir Standard- Meßbereiche definieren zu können, um frühzeitiger Aussagen über den zu erwartenden Erfolg einer Revaskularisationsmaßnahme- inbesondere bei pAVK IV- möglich zu machen.

No conflict of interest.

ID129

Poplitealaneurysma.. oder doch Angiosarkom?

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Dieses systematic literature review wurde durchgeführt, um relevante Schritte für die Diagnose und mögliche Behandlungsmethoden bei Angiosarkomen der A. poplitea in Verbindung mit echten Kniekehlenaneurysmen (APA) zu ermitteln, da diese so selten sind, dass es den meisten Klinikern unbekannt ist. Das systematic literature review wurde gemäß den Prisma-Richtlinien in relevanten medizinischen Datenbanken sowie Studienregistern durchgeführt und vorab über PROSPERO (CRD42024526372) registriert. Die so identifizierten Publikationen wurden von zwei Gutachtern unabhängig voneinander für den Einschluss bewertet. Um sicherzustellen, dass keine geeignete Publikation übersehen wurde, wurde der Volltext aller Abstracts, die auch nur den geringsten Hinweis auf die APA enthielten, abgerufen und auf ihre Eignung geprüft: Es wurden nur Publikationen berücksichtigt, die echte popliteale Aneurysmen in Verbindung mit echten Angiosarkomen behandelten. Falsche Aneurysmen oder Angiosarkome, die nicht mit echten poplitealen Aneurysmen assoziiert sind, sowie andere Tumorentitäten wurden ausgeschlossen. Im Falle von Unstimmigkeiten wurde ein dritter Gutachter hinzugezogen. Außerdem werden drei gut dokumentierte, noch nicht veröffentlichte Fälle- und somit die größte bekannte Fallserie- dargestellt. Es konnten 13 Fallberichte identifiziert werden, in denen über APA berichtet wurde. Neben zwei primär diagnostizierten Fällen (PD) wurden alle anderen Fälle sekundär diagnostiziert (SD) und waren in der Vergangenheit wegen ipsilateraler Aneurysmen operiert worden. Bei den gemeldeten Fällen waren Schmerzen das häufigste Symptom (61 %), gefolgt von Ödemen (46 %) und lokalisierten Schwellungen in der Fossa poplitea. 38 % der Patienten wiesen zum Zeitpunkt der Diagnose eine Metastasierung auf. Bei beiden PD-Patienten wurde eine primäre Resektion des Tumors durchgeführt - in einem Fall mit anschließender arterieller Rekonstruktion, lokaler Strahlentherapie und regionaler hyperthermischer Perfusion. 45 % der SD-Patienten unterzogen sich einer alleinigen großen Amputation, die anderen erhielten unterschiedliche Behandlungsschemata (Chemotherapie, Strahlentherapie (oder Kombination)) oder eine alleinige palliative Versorgung. Die beiden PD-Fälle wurden nur mit kurzen Nachbeobachtungen vorgestellt, aber ohne Rezidiv oder Tod. Die mediane Überlebenszeit für SD-Patienten, die mit einer großen Amputation behandelt wurden, betrug 8 Monate (durchschnittlich 19,2 Monate) und für die anderen im Median 4,5 Monate (durchschnittlich 11 Monate). Nicht-ischämische Schmerzen, Schwellungen und/oder plötzliches Größenwachstum vermeintlicher Poplitealaneurysmen Jahre nach der Behandlung sind hochgradig malignitätsverdächtig und sollten weiter untersucht werden (z. B. Biopsie/PET-CT).

No conflict of interest.

ID130

Identifying risk factors for late dumping syndrome following gastric bypass surgery using an oral glucose tolerance test (OGTT)

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To identify confounding factors leading to the development of post-bariatric hypoglycaemia (PBH) and late dumping syndrome (L-DS) after Roux-en-Y gastric bypass (RYGB) Background: Although its presence as DS has been known in gastric surgery, PBH has only been acknowledged as a typical complication after RYGB in the past. However, factors leading to PBH and reliable diagnostic measures remain unclear. These are essential for deeper understanding of PBH. Patients who underwent RYGB and presented with objective symptoms of DS as defined by the Sigstad score were divided into two groups: those with and those without episodes of hypoglycaemia (defined as a glucose level of less than 45 mmol/L during an oral glucose tolerance test (OGTT)). Confounding factors were identified in the first group of patients. Detected factors include a higher total body weight loss of 45.81±9.30% versus 36.99 ±11.17%, an increased insulinogenic index (IGI) 3.12±9.31 versus 0.71±0.57 and a very low HOMA-IR of 1.45±0.96 vs. 2.85±5.38, corresponding appropriately with the similarly observed absence of a history of diabetes. The most likely cause of the identified risk factors is the unlimited capacity of the preserved beta cells to secrete insulin in the event of duodenal exclusion after RYGB in patients without a history of diabetes. This realisation might have implications for the procedure's indication.

No conflict of interest.

ID131

Tryptophan indole metabolites reduce anastomotic leakage through aryl hydrocarbon receptor-driven interleukin-22 production

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Colorectal cancer (CRC) often requires surgical resection of the tumor and a reconnection of the intestine, called anastomosis. In up to 19% of patients, anastomotic healing (AH) is disturbed, resulting in anastomotic leakage (AL) which leads to increases postoperative morbidity and complications. The preoperative microbiome composition has been implicated in AL. Recent studies have shown that microbial metabolism of tryptophan (Trp) into indole derivatives that activate the aryl hydrocarbon receptor (AhR) can contribute to intestinal tissue healing. In this study we addressed the role of Trp and its metabolites in AL in a CRC patient cohort and a colon-anastomosis mouse model. Targeted quantitative metabolomics was performed in preoperative fecal samples from patients with CRC recruited in the REVEAL cohort, including 19 AL cases. Anastomotic Healing (AH) was evaluated in wildtype, AhR-/- and VillinCreAhrfl/fl mice, and IL-22 drug-targeting was applied to evaluate the role of AhR and IL-22 in AL. Additionally, the origin of IL-22 in anastomotic tissue was investigated. Fifty-two of the 388 patients with available preoperative fecal samples were matched for AH/AL occurrence (AL, n=19; AH, n=33). Amongst Trp metabolites measured preoperatively, indole-3-acetic acid (IAA) was significantly reduced in AL compared to matched AH male patients. In a colon anastomosis mouse model, AhR-/-mice showed augmented AL along with a reduced production of IL-22 compared to WT. Treatment of WT mice with neutralizing anti-IL-22 antibody augmented AL, while applying IL-22Fc protein to AhR-/- mice ameliorated AL. Furthermore, low-Trp diet-fed WT mice exhibited reduced fecal concentration of AhR agonists, similar mucosal microbiome and augmented AL. This phenotype was prevented by dietary supplementation with the AhR agonist indole-3-carbinol. Stimulation of the AhR/IL-22 by synthetic agonists or dietary–derived Trp-metabolites can prevent AL.

Conflict of interest:

WdeJ is a board member and shareholder of AIBiomics BV. SW receives royalties for contributing to WoltersKluwer UpTodate online repository. None of these possible conflicts of interest have direct relations to the content of the current paper. The rest of the authors have no conflicts of interest to disclose.

ID132

Induction of Long-Term Tolerance in Cardiac Allografts via Selective In Vivo Expansion of Regulatory T Cells

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Chronic antibody-mediated rejection (AMR) and the development of cardiac allograft vasculopathy (CAV) remain major contributors to late graft failure following heart transplantation, with limited effective long-term therapies available. Regulatory T cells (Tregs) are key mediators of immune tolerance, capable of suppressing alloimmune responses. This study investigates the potential of in vivo Treg expansion using a complex of interleukin-2 (IL-2) and anti-IL-2 antibody (IL-2cplx) to induce durable tolerance in a murine model of cardiac transplantation. Fully allogeneic heart transplants were performed using BALB/c donors and C57BL/6 recipients. Mice received IL-2cplx (1 µg IL-2 / 5 µg anti-IL-2) and rapamycin (1 µg/g body weight) on days -3, -2, -1, and three times weekly until day 29, in combination with short-term anti-IL-6 monoclonal antibody (600 µg on day -1; 300 µg on days 4 and 6). Graft survival was assessed by daily palpation. Donor-specific antibodies (DSA) were evaluated via flow cytometric crossmatch and ELISA. Donor-reactive T-cell responses were analyzed using mixed lymphocyte reactions. Histopathological assessment of cardiac allografts was performed according to ISHLT grading at day 150. Treatment with the IL-2cplx-based protocol resulted in indefinite graft survival (>150 days; $p < 0.0001$), compared to a median survival time (MST) of 7.5 days in untreated controls. The regimen significantly suppressed DSA formation, including IgG1 ($p = 0.0002$) and IgG2ab ($p < 0.0001$). Donor-specific T-cell reactivity in treated mice remained comparable to that of naïve controls, indicating an absence of sensitization. Histological analyses revealed minimal rejection and significantly reduced myocardial necrosis ($p = 0.02$) in treated animals at late timepoints. This study demonstrates that in vivo expansion of Tregs through IL-2cplx, combined with rapamycin and transient IL-6 blockade, induces operational tolerance in a stringent model of cardiac transplantation. The protocol supports indefinite graft survival without chronic immunosuppression and prevents both humoral and cellular alloreactivity, highlighting its translational potential for promoting long-term graft acceptance

No conflict of interest.

ID133

A NOVEL APPROACH FOR TISSUE ANALYSIS IN JOINT INFECTIONS USING THE SCATTERED LIGHT INTEGRATED COLLECTOR (SLIC)

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Total joint arthroplasty ranks among the most frequently performed surgeries globally, with numbers rising due to demographic shifts. Prosthetic joint infections (PJI) occur in roughly 2% of cases, while septic arthritis (SA) affects approximately 6 individuals per 100,000 annually. Traditional microbiological methods for pathogen detection lack real-time capabilities, and initial empirical antibiotic treatments risk being ineffective. Thus, innovative techniques to expedite diagnosis are vital for effective therapy. This pilot project investigates the use of the Scattered Light Integrated Collector (SLIC) to identify pathogens in joint infections and establishes standard operating procedures (SOPs) for its application in tissue biopsy diagnostics. This prospective study included adult patients with native or periprosthetic joint infections. The study focused on optimizing pathogen extraction from tissue biopsies and identifying them via SLIC (Version 7.1) within 5 hours. The influence of anti- and procoagulants on sample buffers was evaluated. Sequential sampling was utilized for biopsy collection, while bacterial density was enhanced using titration series. Additionally, cryopreservation methods were assessed for reproducibility to support future diagnostics and research. The study found that simple pretreatment facilitated the detection of pathogen growth in infected tissue samples. The protocols demonstrated reliability after cryopreservation at 20°C for up to 8 weeks, with no significant variance compared to initial testing ($p > 0.05$). Results were consistent for samples stored at -80°C for up to 8 weeks ($p > 0.05$). Similar outcomes were achieved across sample volumes from 25 µl to 300 µl, with higher thresholds for larger volumes showing no significant differences within the 5-hour testing window ($p > 0.05$). Moreover, EDTA tubes exhibited an inhibitory effect on growth when compared to inert tubes or those containing alternative pro- and anticoagulants ($p < 0.05$). Managing joint infections is challenging due to their multidisciplinary nature. Accurate microbiological diagnosis is essential for effective treatment and successful surgical outcomes. This study introduces a simple and quick diagnostic tool for detecting joint infections using tissue biopsies and develops an SOP for further research with this innovative technique. The suggested SOP enables SLIC to detect pathogens within 5 hours using joint tissue, offering a novel approach in diagnosing PJI and SA. While not yet designed to compare sensitivity to other culture methods, it provides a solid basis for further clinical research.

No conflict of interest.

ID134

A NOVEL APPROACH FOR SYNOVIAL FLUID ANALYSIS IN JOINT INFECTIONS USING THE SCATTERED LIGHT INTEGRATED COLLECTOR (SLIC)

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Prosthetic joint infections (PJI) occur in up to 3% of patients following joint replacement surgery, significantly impacting quality of life and increasing mortality risk. Septic arthritis (SA) affects approximately 2 to 6 individuals per 100,000 annually. Revision surgeries in Europe impose substantial economic burdens, averaging $32,933 for knees and $28,904 for hips. Currently, no single diagnostic test for PJI exists, necessitating standardized criteria and the use of multiple diagnostic techniques. As joint surgeries rise, the need for efficient diagnostic tools grows increasingly critical. This pilot study investigates the detection of pathogens in patients with joint infections using the Scattered Light Integrated Collector (SLIC) and develops the first standard operating procedures (SOPs) for synovial fluid analysis. This prospective study included adult patients presenting with native or periprosthetic joint infections. Ambulatory joint aspirations and intraoperative synovial fluid samples were collected as initial steps. Following the development and validation of an SOP, these samples underwent pathogen detection using SLIC (Version 7.1) within a 10-hour timeframe. Additionally, the effects of pro- and anticoagulants on sample buffers were examined. Bacterial density was optimized using titration series, while the safety and reproducibility of cryopreservation methods were assessed to support future diagnostic and research efforts. The study revealed that simple pre-treatment protocols effectively visualized pathogen growth in synovial fluid samples. Lithium Heparin, clot activator, and Falcon tubes performed significantly better than EDTA tubes in maintaining pathogen viability ($p < 0.05$). Furthermore, the established protocols demonstrated consistency and reliability following prolonged cryopreservation at -20°C and -80°C for up to 8 weeks, with no notable differences from primary testing ($p > 0.05$). Variations were observed in sample volumes ranging from 25 µl to 200 µl, with larger volumes yielding higher thresholds in biological replicates. Significant differences in AUC (area under the curve) were identified within the 10-hour testing period for 100 µl and 200 µl samples ($p < 0.05$). Joint infections pose multidisciplinary challenges, emphasizing the importance of accurate microbiological diagnosis for effective therapy and positive surgical outcomes. This study introduces a rapid, easy-to-implement diagnostic approach using synovial fluid and establishes a standardized operating procedure enabling pathogen detection within 10 hours. Although sensitivity comparisons with conventional methods are pending, the study lays a solid foundation for further clinical research.

No conflict of interest.

ID135

The Surgical Track

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Surgery faces significant challenges arising from changes in medical education and the declining attractiveness of a surgical career path for aspiring physicians in the Western world. Students' expectations of their future workplaces have shifted considerably, with increasing importance placed on career planning uncertainties, an imbalanced work-life relationship, and the lack of compatibility between family and professional life. The entry of Generation Z into the workforce will also impact the surgical field. Although women now make up the majority of medical graduates, only a few choose to pursue a career in surgery. This growing shortage of junior surgeons is expected to affect medical care in surgical departments across Germany negatively. Intense competition for talent is already emerging in all medical specialties. Since interest in surgical training tends to decline throughout medical studies, early integration of surgical skills into the curriculum is crucial to counteract this trend. For this reason, we have developed the "Surgical Track," which we present here. It offers targeted, innovative teaching concepts to spark early enthusiasm for surgery among students. The program is based on two key pillars: virtual reality (VR) and robotics. Students can train for operations and emergency scenarios using VR simulations and perform practical exercises on robotic systems. The central hub for this program is the CeMIT Cologne, where both VR sessions in seminar format and robotic training can be conducted. High-quality educational concepts like the "Surgical Track" can help foster enthusiasm for surgery while simultaneously imparting knowledge, even if their long-term impact still requires evaluation. Through virtual simulations, robotic surgery, and innovative teaching approaches, students gain insights into visceral surgery that blend theoretical understanding with hands-on experience.

No conflict of interest.

ID136

A strategy for inducing colorectal liver metastases in mice suitable for evaluating therapeutic interventions

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Many patients with colorectal cancer (CRC) already present with liver metastases, and complete resection remains the only curative option. For patients where surgical resection is not feasible, classic chemotherapy is the sole treatment, though it is not curative and is hepatotoxic. Moreover, liver regeneration after partial hepatectomy can promote the growth of residual tumors. Thus, novel therapeutic strategies that balance antitumor and pro-regenerative effects are needed. To evaluate these approaches, robust animal models are essential. We present a preclinical mouse model using a murine colorectal cancer cell line with key mutations found in human disease, providing a relevant platform to investigate innovative treatments for metastatic colorectal cancer. Male C57BL/6 mice were used. Following midline laparotomy, 1.5×10^5 murine CRC cells in 70 µl PBS were injected into the lower pole of the spleen using a 30G needle, and partial splenectomy was performed approx. 2 min. later to promote cancer cell entry into the portal system. Intrahepatic metastases were assessed by bioluminescence imaging (BLI) using a firefly luciferase reporter. D-Luciferin (150 mg/kg) was administered intraperitoneally 10 minutes before imaging, and BLI was quantified as average radiant efficiency (photons/s/cm²/sr). After CRC cell injection, the animals remained in the experiment for 21 days. Untreated animals showed a continuous increase in tumor burden, with the BLI signal increasing by a factor of 5 to 10 per week. At the end of the experiment, the tumor burden, indicated by a BLI signal between 10^6 and 10^7, had not yet led to clinical symptoms in the animals. Animals were treated from the second postoperative day with the oral polymerase I inhibitor CX-5461 (50 mg/kg/day). This therapy significantly reduced CRC growth in the liver, with a 16-fold decrease in signal intensity compared to untreated tumors: 18± 5.5 (x105) vs. 284±134 (x105). This reduction in signal intensity is also evident in the visual tumor burden at the end of the experiment. Our preclinical mouse model offers several advantages: (1) The cell line used harbors four key human CRC mutations (Apc, Trp53, Kras, Tgfbr), shows high in vivo engraftment rates, and provides a highly relevant translational tool. (2) The luciferase-transduced cells enable non-invasive tracking of tumor growth. (3) Intrasplenic tumor cell injection is superior to other injection sites (intrahepatic, intraportal). (4) Partial splenectomy is performed, preserving immune cell formation.

No conflict of interest.

ID137

Characterization of Circulating microRNAs from Molecularly Defined Tumor Models for Developing a CRISPR/Cas13a-Based Liquid Biopsy Platform for Therapy Monitoring

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Radio-chemotherapy remains a cornerstone in neoadjuvant and adjuvant treatment of malignant tumors. However, current methods for predicting therapy resistance are insufficient for personalized treatment planning. Clinical evaluation still relies heavily on MRI and CT imaging, which, despite their prevalence, are resource-intensive and limited in sensitivity and specificity. The frequent occurrence of pseudoprogression during radio-chemotherapy further complicates clinical decision-making and underscores the need for more accurate, minimally invasive diagnostics. This study aims to improve prediction of therapeutic resistance using advanced 3D in vitro glioblastoma models and orthotopic xenografts that represent molecularly defined subtypes, including therapy-resistant mesenchymal variants based on transcriptomic profiles. These models were treated with clinically relevant mono- and combination therapies, with response measured via ATP quantification in vitro and tumor volume changes in vivo. To identify molecular correlates of treatment efficacy, we profiled small RNA transcriptomes from tumor cells and tissues, culture supernatants and murine plasma using next-generation sequencing (NGS). Candidate microRNAs were identified and are being validated using a CRISPR/Cas13a-based detection platform. Bioinformatic analysis incorporating both negative (non-tumor bearing plasma and brain) and positive (untreated tumor) controls revealed plasma-derived microRNAs that strongly correlate with treatment response. These candidates, currently under IP evaluation, show promise as robust biomarkers for monitoring aggressive cancers. Further, we demonstrate integration of optogenetically controlled reagent transport via light-switchable systems for pump-free, autonomous sample handling. Coupled with multiplexed, on-chip detection of epigenetic markers, including DNA methylation, key mutations (e.g., TP53), structural alterations (e.g., EGFRvIII) and miRNAs, this platform holds potential for fully automated, high-sensitivity, point-of-care diagnostics. Together, these advances may significantly improve early detection of therapy resistance, enabling more adaptive and effective treatment strategies for glioblastoma, PDAC and other aggressive, late-detectable cancers.

No conflict of interest.

ID138

Carprofen-associated anastomotic leakage following Roux-en-Y gastric bypass in mice

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Anastomotic leakage is a serious complication following Roux-en-Y gastric bypass (RYGB) and significantly impairs postoperative outcomes. In animal models for RYGB the COX-2 inhibitor Carprofen is used as postoperative analgesic in over 50% of preclinical RYGB studies in mice, despite isolated reports of its negative effects on intestinal wound healing. In this study, we aimed to investigate the effects of Carprofen on intestinal wound healing and to evaluate whether safer analgesic alternatives exist for use in animal models involving intestinal anastomoses. In this study, an RYGB model was established in C57BL/6J mice. Initially, 17 animals received postoperative Carprofen (5 mg/kg s.c. twice daily for 3 days). Then analgesia was switched to metamizole (80 mg/kg s.c. twice daily + 375 mg/kg/day p.o., for 3 days; n = 21). All mice were weighed and scored daily; oral refeeding was performed over three days. The study endpoint was day 14 post-op. All mice survived surgery and showed no perioperative complications. In the Carprofen group, 14 out of 17 mice (82%) developed anastomotic leakage within the first three postoperative days, most commonly at the jejunojejunal anastomosis (n = 12). In contrast, the metamizole group showed a significantly lower leakage rate of 19% (4/21). Macroscopically, Carprofen-treated mice exhibited impaired wound healing, and histological analysis revealed increased inflammation at the anastomosis site. To our knowledge, this is the first study to demonstrate a detrimental effect of Carprofen on jejunal anastomotic healing in the RYGB mouse model. These results highlight the critical importance of appropriate analgesic selection in experimental surgical models. We strongly advise against the use of Carprofen in intestinal anastomosis models and consider metamizole a suitable alternative.

No conflict of interest.

ID139

Cologne ergonomic measurement for robotic surgery (CEMRobSurg) using the HugoTM RAS System

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The ergonomic advantages and potential challenges that robotic surgery poses to the well-being of surgeons are mainly unexplored. The most recent surgical robot introduced on the European market is the HugoTM RAS System by Medtronic. This study aims to evaluate the ergonomic benefits of the HugoTM RAS System, which is available in our training laboratory, CeMIT (Center for Medical Innovation and Technology Cologne). Using the previously established Cologne Ergonomic Measurement Setup for Robotic Surgery (CEMRobSurg), we measured three parameters related to ergonomic posture from subjects with different levels of surgical expertise (laypeople, medical students, surgical residents, and expert robotic surgeons). The heart rate was measured continu- ously using a polar band. The noise level was measured while using the HugoTM RAS System, and automated photographs using our locally developed methodology were captured of the participant every 2 s to assess body posture. The ergonomic measurements were conducted while the subject performed the same standardized robotic training exercises (Peg Board, Rope Walk, and Ring Walk). A total of 53 participants were enrolled in this study. The average noise level during all measurements was 54.87 dB. The highest stress level was measured in surgical residents with a sympathetic nervous system index (SNS index) of 1.15 (min − 1.43, max 3.56). The lowest stress level was measured in robotic experts with an SNS index of 0.23 (min − 0.18, max 0.91). We observed a risk-prone positioning of the neck and elbow in medical students (mean 39.6° and 129.48°, respectively). Robotic experts showed a risk positioning in the knee and hip region (mean 107.89° and 90.31°, respectively). This is the first study to analyze and objectify the ergonomic posture of medical students, surgical trainees, surgeons, and laypeople using the open console, modular HugoTM RAS System. Our findings offer recommendations for operating surgeons and allow for a comparative analysis between the different robotic systems. Further evaluations in real- time operative scenarios will follow.

No conflict of interest.

ID140

Fracture-related Infektionen (FRI) am Unterschenkel erfolgreich behandeln: 5-Jahres-Ergebnisse eines orthoplastischen Zentrums

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Trotz medizinischer Fortschritte sind fracture-related Infektionen (FRI), insbesondere nach offenen Unterschenkelfrakturen, eine gefürchtete Komplikation. Durch die interdisziplinäre Therapie in orthoplastischen Zentren kann der Extremitätenerhalt zunehmend ermöglicht werden. Allerdings ist das klinische Outcome nach FRI an diesen Zentren bislang unklar. Ziel dieser Studie war daher Behandlungsergebnisses von FRI an einem deutschen orthoplastischen Zentrum zu untersuchen. In einer retrospektiven Monozenterstudie wurden alle Patient:innen einer Klinik der Maximalversorgung mit orthoplastischem Zentrum eingeschlossen, die zwischen 2018 und 2023 aufgrund einer FRI nach Unterschenkelfraktur behandelt wurden. Die standardisierte interdisziplinäre Therapie durch Orthopädie/Unfallchirurgie und Plastische Chirurgie umfasste knöcherne und weichteilige Débridements sowie, je nach Befund, knöcherne und weichteilige Defektrekonstruktionen. Das Outcome wurde anhand der Raten für Remission, Persistenz/Rezidiv sowie primäre und sekundäre Amputationen analysiert und in Abhängigkeit vom Therapieverfahren ausgewertet (deskriptive Auswertung, Signifikanzniveau $p<0,05$). Insgesamt wurden 198 Patient:innen (n=45 weiblich, n=153 männlich, Alter 55,1±11,3 Jahre) mit 207 Frakturen am Unterschenkel (Monoetagenverletzung n=190, Mehretagenverletzung n=8) eingeschlossen. Dabei lagen bei n=89 (44,9%) offene und n=76 (38,4%) geschlossene Frakturren vor, während bei n=33 (16,7%) die Frakturform retrospektiv nicht eindeutig bestimmbar war. Am häufigsten betraf die FRI den Tibiaschaft (n=79; 39,9%) und die distale Tibia (n=67; 33,8%), gefolgt von der proximalen Tibia (n=25; 12,6%), dem OSG und der Fibula. Therapeutisch wurden n=88 (44,4%) ausschließlich knöchern debridiert und rekonstruiert, n=102 (51,5%) erhielten zusätzlich eine Lappenplastik und n=8 (4,0%) mussten primär amputiert werden. Eine Remission wurde bei n=148 (74,7%) erreicht (ohne Lappen: n=76; mit Lappen: n=72), während n=24 (12,1%) eine persistierende/rezidivierende Infektion entwickelten (ohne Lappen: n=9; mit Lappen: n=15). Sekundäre Amputationen waren bei n=18 (9,1%) notwendig (ohne Lappen: n=3; mit Lappen: n=15). Insgesamt konnte ein Extremitätenerhalt bei n=172 (86,9%) erzielt werden, wobei n=87 (50,6%) zusätzlich zu den knöchernen Rekonstruktionen eine Lappenplastik erhielten. Diese Studie analysiert erstmals das Outcome von FRI am Unterschenkel in einem deutschen orthoplastischen Zentrum. Innerhalt von 5 Jahren konnte durch die interdisziplinäre Therapie in 74,7% der Fälle eine Remission erzielt und in 86,9% der Extremitätenerhalt erreicht werden. Die Amputationsrate lag damit bei nur 13,1%. Diese Ergebnisse unterstreichen die Bedeutung interdisziplinärer Behandlungsansätze und den hohen Stellenwert orthoplastischer Zentren in der Therapie von FRI.

No conflict of interest.

ID141

NEXT-GENERATION DIAGNOSTICS IN PEDIATRIC SURGERY: APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNIQUES IN ACUTE APPENDICITIS

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Current diagnostic options for appendicitis have reached their limits. Given the pathophysiological aspects and new conservative treatment options, new analytical and reliable diagnostic methods are essential. The aim of the study was to demonstrate the proof of concept for the application of machine learning (ML) and artificial intelligence (AI) methods to routine parameters and gene expression analysis (GEA) data as a future framework for the diagnosis of pediatric inflammatory diseases. Ethical approval was granted by the local ethics committee. Machine learning and artificial intelligence (AI) methods were applied to routine laboratory and sonographic data from 473 patients with phlegmonous (PA) and gangrenous (GA) appendicitis aged 0–17 years. Modern artificial intelligence and machine learning algorithms were applied to 56,666 GEA datasets from 29 patients with PA and GA aged 7–17 years using resampling methods. The analysis was performed using ROC curve analysis. The application of ML and AI methods to routine diagnostic data led to significantly improved discrimination of PA and GA based on distinct biomarker signatures compared to routine values at the cutoff points alone. In addition to describing distinct immunological pathophysiologies in patients with PA and GA using GEA, the application of ML and AI led to the definition of a discriminatory biomarker signature. The informative value of limited diagnostic datasets can be significantly improved using ML and AI methods. GEA is a valuable tool for scientific and clinical applications in inflammatory diseases. The combination of both methods significantly expands the diagnostic spectrum.

No conflict of interest.

ID142

Evaluation of Current Online Large Language Models as a Decision Support Tool for Abdominal Pain in the Emergency Department

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Abdominal pain is a common yet diagnostically challenging chief complaint in emergency medicine. This study aimed to evaluate current Large Language Models (LLMs) as decision support tools. Methods Using 100 real case vignettes from an emergency department, ChatGPT (GPT-4o), Gemini (Gemini 1.5 Pro), medical specialists, and medical students were compared regarding diagnostic accuracy and urgency assessment. For the top-1 diagnosis (median, IQR), ChatGPT (0.44; 0.41-0.49), Gemini (0.43; 0.41-0.48), and specialists (0.44; 0.43-0.46) achieved similar diagnostic accuracy, while medical students performed slightly worse (0.39; 0.31-0.49). For top-3 diagnoses, ChatGPT, with a median of 0.76 (0.73-0.78), outperformed Gemini (0.66; 0.65-0.70), specialists (0.66; 0.61-0.68), and medical students (0.61; 0.51-0.70). In urgency assessment, ChatGPT, with a median sensitivity (IQR) of 1.00 (0.97-1.00), surpassed Gemini at 0.94 (0.90-0.96), specialists at 0.86 (0.77-0.92), and medical students at 0.80 (0.72-0.93). On average, LLMs processed cases 10 times faster than specialists and 18 times faster than medical students. ChatGPT demonstrated diagnostic performance comparable to specialists and surpassed them in identifying urgent cases. LLMs could be valuable as cognitive support, especially for less experienced physicians in the emergency department. Further prospective studies are needed to validate these findings and investigate clinical utility.

No conflict of interest.

ID143

Perioperative biosampling and bioanalysis facilitate advanced translational thoracic surgery research towards personalized medicine

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Development and progression of respiratory diseases present a major medical burden. Biomedical research in thoracic surgery and pneumology is driven by highly innovative experimental models. To enable translational research in lung cancer (LC) and chronic lung diseases (CLD), a collaborative work including on-site biosampling, bioanalysis and processing of human samples in affiliated research institutes is mandatory. Thus, complex in-vivo and ex-vivo culture disease models became central research tools for pulmonary research. Perioperative human biosampling of blood serum, lung parenchyma, airways, pleura tissue and effusions is routinely performed at the University Division of Thoracic Surgery Munich, Asklepios Medical Center and Biobank Munich-Gauting. Blood serum was further analyzed by Fourier-transform infrared spectroscopy, a novel technique to enable risk stratification in LC and COPD patients. Fresh samples from LC and CLD patients were used to generate precision cut lung slices in 3D ex-vivo cultures for pharmacological studies. Primary cells from central and peripheral airways generated 3D in-vitro and ex-vivo cultures that mimic IPF and COPD. Native pleural fluid was generated in patients with and without pleural effusions, based on a novel technique developed in our hospital. Biosampling is followed by 3D IF imaging and multi-omics analysis (transcriptomics, proteomics, single cell RNA-seq). The Asklepios Biobank Munich Gauting provided more than 250 lung tissue samples, 250 pleural effusions/ lavages and 300 blood serum samples within the last five years to collaborating research groups with focus on LC (Kepsidis et al.,2024) and tissue engineering in CLD. On-site biosampling and bioanalysis contributed to establishment of the human ex-vivo IPF model (Alsafadi et al.,2017), development of novel antifibrotic therapies (Gerckens et al.,2021), characterization of lung cell landscape in COPD/ IPF (Stoleriu et al.,2024, Lang et al.,2024), as well as of pleural/ subpleural space (Fischer et al.,2025). Thoracic surgery substantially contribute to human in-vivo and ex-vivo studies mimicking pulmonary diseases and improve biomedical research outcomes by reducing animal experiments. Establishment of certified biorepositories ensures productive and sustained collaborations between clinical and experimental departments aiming LC screening and the study of novel therapies in CLD towards personalized medicine.

No conflict of interest.

ID144

Combined cell- and gene therapy using cardiac (myo)fibroblasts: Impact on the scar cellularity and function

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The cardiac scar consists mainly of (myo)fibroblasts (FB) and lacks Connexin (Cx43) expressing cardiomyocytes resulting in functional impairment of myocardial infarction (MI) affected patients. So far, cell therapeutic approaches have been less effective due to cell loss after transplantation. Therefore, we aimed to develop an effective therapeutic approach consisting of a combined cell- and gene therapy. To investigate the impact on scar cellularity, we used isolated genetically labelled (mTmG (Gt(ROSA)26Sortm4(ACTB-tdTomato,-EGFP)Luo) neonatal (P3) exoFB and enriched these for 5 days (d). One day prior to injection, cells were loaded with magnetic-nanoparticles (PMAO, 25 pg Fe/cell). To analyze the impact on cardiac function, we isolated embryonic wildtype FB (mFB) and used lentiviral transduction to overexpress Cx43 in mFB. 2.0x 105 exoFB or mFB were injected into freshly cryolesioned (CI) hearts of 10-12 weeks old CD1 female mice using magnetic steering. FB engraftment and functional measurements were assessed 2 weeks following CI and FB transplantation. In vitro analysis of isolated and cultured cells showed a FB purity of >95% (vimentin+ and αSMA+), as well as a proliferation rate of 13% (Ki67+). Transplanted tomato+ exoFB could be easily distinguished from native endogenous FB (endoFB) and showed a stable engraftment rate of more than 25% of the transplanted cells (14d: 53,000, n=4). Transplanted FB continued to proliferate in vivo, as 13%, analogous to the in vitro data, were Ki67+. Additionally, transplanted FB induced endoFB proliferation as the amount of Ki67+ FB was significant increased compared to CI animals 14d after cell-transplantation (16% vs 4%). In the adjacent native myocardium no increased fibrosis was observed. Furthermore, 14d after transplantation of lentiviral transduced Cx43 overexpressing mFB, a reduced incidence of ventricular tachycardia and improved left ventricular pump function could be detected. Transplantation of cardiac FB after MI resulted in a prominent and stable cell engraftment over time. Moreover, injected FB continued to proliferate without affecting the healthy myocardium. Our therapeutic approach resulted in improved cardiac function and displayed an effective way of targeting the cardiac scar.

No conflict of interest.

ID145

The Role of Enteric Glial Cells and Enteric Neurons in Shaping the Colorectal Cancer Tumor Microenvironment.

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Colorectal cancer (CRC) is a leading cause of cancer-related mortality, characterized by a complex tumor microenvironment (TME). While the involvement of immune and stromal cells is well-studied, the role of the enteric nervous system (ENS) is an emerging area of investigation. The ENS, comprising enteric glial cells (EGCs) and enteric neurons (ENs), regulates crucial gut functions and is increasingly implicated in modulating the TME. This study aims to dissect the distinct and overlapping contributions of EGCs and ENs to CRC pathogenesis. We utilized the azoxymethane/dextran sodium sulfate (AOM/DSS) model to induce CRC in wildtype and Sox10-CreERT2 x Rpl22HA/+ mice. Immunohistochemistry (IHC) on tumor tissues from RiboTag-floxed x Sox10-CreERT2-tdTomato, Sox10-CreERT2 x Sun1-GFP and C57Bl/6J mouse lines confirmed the presence and spatial distribution of EGCs and ENs within the tumor tissue. IHC further revealed a close spatial association between EGCs, IBA1+ macrophages and the podoplanin-positive desmoplastic stroma regions within the tumor. Initial transcriptional profiling of EGCs using a RiboTag-based approach (Sox10-CreERT2 x Rpl22HA/+ mice) revealed approximately 3,700 differentially expressed genes in CRC compared to naive EGCs. Notably, a significant overlap was observed with previously established gliosis gene sets, indicating a reactive glial phenotype in the CRC TME. Gene Ontology analysis of these overlapping genes highlighted enrichment in processes related to macrophage differentiation and activation. However, this RiboTag approach showed limitations due to epithelial cell contamination. To overcome these limitations and enable cell-type-specific transcriptomics with higher purity, we optimized a nuclei isolation protocol from full-thickness colonic tissues. This optimized protocol has yielded nuclear RNA from sorted nuclei for downstream RNA sequencing. Our findings indicate that EGCs adopt a reactive phenotype in the CRC TME and are spatially associated with fibrotic regions and immune cells. The established nuclei isolation method provides a robust platform for future single-nucleus RNA sequencing to dissect the heterogeneity and specific roles of EGC and EN subtypes in CRC. This research will provide novel insights into the neuro-immune and neuro-stromal interactions within the CRC TME, potentially identifying new therapeutic targets.

No conflict of interest.

ID146

Generating gut-specific CAR Tregs to treat inflammatory bowel disease

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The two major types of inflammatory bowel disease (IBD) are ulcerative colitis (UC) and Crohn's disease (CD). Their pathophysiology is considered multifactorial and involves genetic predisposition, altered immune function, changes in intestinal microbiota, environmental factors, and loss of intestinal barrier function. One important driver is the loss of immune homeostasis, which is related to qualitative and quantitative changes in the regulatory T cell (Treg) pool under chronic inflammatory conditions. Therapeutic aims include intestinal mucosal healing and intestinal barrier restoration. Promising strategies to achieve these aims include new approaches to maintain Treg integrity and guide them to the inflammatory site. In order to enhance their specificity and function, Tregs can be genetically engineered to express chimeric antigen receptors (CARs). CARs are synthetic, modular receptors that combine an antigen-recognition domain with intracellular signaling elements. Typically, CARs consist of an extracellular single-chain variable fragment (scFv) fused to a transmembrane domain and intracellular signaling domains, such as CD28, 4-1BB, and CD3ζ. This design facilitates the antigen-specific Tregs in providing customized activation signals upon antigen engagement. In this study we have modified Tregs to express a chimeric antigen receptor targeting a protein that is upregulated in inflamed intestinal tissue. This allows an activation of CAR-Tregs at sites of gut inflammation. Further functional characterizations will indude assays for Treg activation, cytokine secretion, suppression of effector T cell responses, and restoration of epithelial barrier function in vitro using two-dimensional (2D) cell models and organoids, as well as in vivo IBD mouse models. The objective of this project is to demonstrate the feasibility and therapeutic benefit of CAR-engineered Tregs as a next-generation, site-directed immunotherapy for IBD. This treatment has the potential to re-establish mucosal immune tolerance, enhance endogenous tissue repair, and reduce chronic intestinal inflammation.

No conflict of interest.

ID147

The lighthouse project "Preclinical Models" of the Bavarian Cancer Research Center (BZKF)

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The BZKF lighthouse project "Preclinical Models" aims to advance translational cancer research by addressing a key challenge in oncology: the limited transfer of basic scientific findings into clinical application. A key reason for this translational gap is the lack of transparency and networking regarding the availability and use of preclinical models. To address this, a database that provides a user-friendly and comprehensive overview of organ-specific organoids, including corresponding patient data and associated oncological animal models was created. The presentation of this structure at conferences aims to increase the visibility and participation of researchers across different disciplines. The organoid database section provides access to tumor organoids derived from various tumor entities with associated genetic data, normal tissue organoids and standardized cultivation protocols. It includes detailed metadata such as the cryopreservation time point, number of frozen aliquots, and passage number at the time of freezing. The organoids are stored at across multiple BZKF sites. Researchers interested in utilizing organoids for experimental purposes may directly contact the generating scientists. The animal model database section includes an overview of oncological models, standardized text modules for animal experiments, and integrated training videos for education and support of 3R principles. It also includes essential data on tumor growth measurements, human endpoints, score sheets, and the overall severity classification of experiments. In addition to the connected preclinical database that is unique in integration and cross-linking of different preclinical models and thus distinguishing it from other existing databases, the lighthouse project is committed to the search for new druggable targets. For this purpose, a target validation unit was established that employs an innovative technique for targeting cellular protein degradation, known as the AID system. This technique enables proof-of-concept evaluation of novel oncogenic candidate proteins for their suitability and efficacy as potential therapeutic targets. The lighthouse project provides a unique combination of an information source for preclinical models, a resource for tumor organoids and a platform for target validation. This makes it an important contributor for the goal of accelerating the translation of research findings into clinical practice.

No conflict of interest.

ID148

Robotisch-assistierte Leberchirurgie: Erhaltung der Immunkompetenz und Minimierung postoperativer Inflammation

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In den letzten Jahren konnten komplexere roboterassistierte Leberresektionen (RLR) etabliert werden, die eine praktikable Alternative zur offenen Leberresektion (OLR) darstellen. Während die kurzfristigen Vorteile der minimal-invasiven Chirurgie, darunter ein geringerer Blutverlust und kürzere Krankenhausaufenthalte, bekannt sind, ist die Entzündungsreaktion auf verschiedene chirurgische Ansätze noch wenig erforscht. Diese Pilotstudie untersucht die Immunreaktion im peripheren Blut sowie im lokalen Leber- und Peritonealgewebe während und nach einer Leberoperation bei 22 Patienten (11 in jeder Gruppe). Die Studie analysierte klinische und Laborparameter, Leukozytenaktivierung sowie Zytokin-/Chemokinspiegel vor und nach der Leberparenchymdissektion mittels eines L-Selectin-Shedding-Assay und FACS-Multiplex-Analysepanel. Im perioperativen Verlauf sind die systemischen und lokalen Leberzytokinspiegel von IL-6 und IL-10 bei RLR reduziert. Die Laparotomie selbst führte zu höheren Ausgangswerten von IL-6, IL-8, CXCL10, IFNγ, TGFβ1 und IL-1β im lokalen Lebergewebe der OLR-Gruppe. Nach der Leberparenchymdissektion wiesen RLR-Patienten im Vergleich zur OLR-Gruppe reduzierte Werte von IL-6, IL-8, IFNγ, MCP-1, IL-1β, TGFβ1 und CXCL10 auf. Im späten postoperativen Verlauf vom 5. bis 20. postoperativen Tag (POD) war das systemische Chemokin MCP1 reduziert, einhergehend mit einer Abnahme der CD4+/CD8+-Lymphozyten und einer höheren L-Selectin-Shedding-Kapazität in der RLR-Gruppe ab POD5. Diese Ergebnisse legen nahe, dass RLR die Immunkompetenz im peri- und späten postoperativen Verlauf wirksamer erhält als OLR. Die verringerte systemische und lokale Entzündungsreaktion ist mit einer günstigen kurzfristigen Genesung verbunden und unterstreicht die Bedeutung der roboterassistierten Leberchirurgie in der klinischen Praxis.

No conflict of interest.

ID149

Inhibition of RNA Pol I sensitizes colorectal cancer cells to ATR inhibition by inducing transcription-replication conflicts

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The majority of colorectal cancers (CRC) are characterized by loss-of-function mutation within the tumor suppressor gene APC leading to aberrant activation of the WNT signaling pathway. Consequently, APC loss-induced overexpression of the MYC oncogene is the major driver for CRC development. MYC is not only essential for inducing transcription by all three RNA polymerases (RNA Pol I/II/III), but also for the coordination of RNA transcription and DNA replication in highly proliferative cancer cells. In general, CRC shows elevated RNA Pol I activity and, thus, enhanced transcription of ribosomal RNA genes compared to normal tissue. Here, we show that inhibition of RNA Pol I by the inhibitor CX-5461 induces transcription-replication conflicts (TRCs) specifically in ribosomal DNA regions in CRC. This in turn results in cell cycle arrest and activation of ATR/ATM signaling indicative of a DNA damage response (DDR). Simultaneous inhibition of the elicited DDR by the ATR inhibitor AZD6738 results in apoptosis in CRC cell lines as well as in both murine tumor organoids and human patient-derived organoids. In a highly invasive colorectal liver metastasis (CRLM) in vivo model, combination treatment with CX-5461 and AZD6738 blocks tumor growth compared to single treatments opening a therapeutic window for advanced CRC.

No conflict of interest.

ID150

Extracurriculare Implementation eines chirurgischen Naht- und Knotenkurses für Studierende der Zahnmedizin

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Die Beherrschung von Naht- und Knotentechniken ist für das Studium der Zahnmedizin essentiell. Vielfach begegnen den Studierenden Möglichkeiten, die entsprechenden Fertigkeiten am Patienten umzusetzen – so zum Beispiel bei Extraktionen, Traumaversorgungen und kleineren chirurgischen Eingriffen. Hierbei handelt es sich um sog. Entrustable professional activities, also ärztliche Aufgaben, die bei vorhandener Kompetenz an Studierende übertragen werden können. Um die Kompetenzen im Bereich von theoretischem Wissen und praktischen Fertigkeiten zu stärken, bietet die Klinik und Poliklinik für Mund-, Kiefer und Plastische Gesichtschirurgie in Bonn seit dem Sommersemester 2022 einen extracurricularen Naht- und Knotenkurs an. Dieser wird durch den Fonds der Qualitätsverbesserungskommission finanziert. Der Kurs wird ärztlich geleitet und von einer Studentischen Hilfskraft (SHK) unterstützt. Ein Kurstag umfasst eine 90-minütige Einheit, in welcher zu Beginn eine ca. 20-minütige Einführung in die Materialkunde stattfindet. Im Anschluß werden die zehn Studierenden der klinischen Fachsemester schrittweise und anhand von interaktiver Fallbearbeitung an Einzelknopfnähte sowie an Kreuznähte und modifizierte Matratzennähte herangeführt. So wird beispielsweise der Fall einer sternförmigen Rissquetschwunde an der Augenbraue besprochen und konsekutiv am Hautnahttrainer (Fa. 3b-Scientific) die Wundversorgung durchgeführt. Ebenso wird das Vorgehen bei Zahnextraktion unter Antikoagulation diskutiert und anschließend erfolgt ein hämostyptischer Wundverschluß am Phantomkopf mit restbezahnten Kiefermodellen (Fa. Frasaco). Ziel dieser Studie ist die Analyse der Selbstwirksamkeit, welche dieser Kurs den Studierenden vermittelt, um in Zukunft eine breite Implementierung in das Curriculum zu erzielen. Vor Beginn des Kurses wurde ein Evaluationsbogen ausgehändigt und durch die Studierenden ausgefüllt, welcher Fragen zur Selbsteinschätzung beinhaltet. Die Antworten entsprechen einer Ordinalskala von eins (= trifft voll zu) bis sechs (=trifft überhaupt nicht zu). Nach dem Kurs wird ein weiterer Evaluationsbogen ausgehändigt, welcher die oben genannten Fragen erneut aufgreift und weiterhin Fragen zum organisatorischen Ablauf beinhaltet. Zur statistischen Auswertung wurde das Programm SPSS (Version 29, IBM, Amonk, New York, USA) genutzt. Für deskriptive Parameter der Kohorte wurden Mittelwert und Standardabweichung berechnet. Zur Analyse der Selbsteinschätzung der Studierenden wurde der T-Test für paired samples genutzt. Ein p-Wert von <0,05 wurde als statistisch signifikant beschrieben. An der Studie nahmen insgesamt 103 Studierende (w= 62%, m=38%) vom 6. -10. Fachsemester teil. 7 % der Teilnehmenden wiesen Vorkenntnisse der Naht- und Knotenkunde auf. Studierende sahen sich nach der Intervention signifikant häufiger in der Lage eine chirurgische Wundversorgung durchzuführen, dies in ihrem späteren Arbeitsalltag zu integrieren und legten Hemmungen gegenüber entsprechenden Tätigkeiten ab ($p < 0,001$). Die extracurriculare Implementation des Kurses ließ sich innerhalb kürzerer Zeit durchsetzen, sodass sich das Format derweilen zum festen Bestandteil der chirurgischen Lehre entwickelt hat. Zur positiven Ausgestaltung der chirurgischen Lehrangebote hat sich unser Format mit Fokus auf überschaubare Gruppengröße und interaktive, niederschwellige Lernatmosphäre bewährt. Chirurgische Kernkompetenzen und die Freude an den curricularen Veranstaltungen konnte gestärkt werden. Der Naht- und Knotenkurs ist zudem als Grundlage für weitere Aufbaukurse zu sehen. Derzeit in Planung ist sowohl ein mikrochirurgischer Nahtkurs als auch ein Kurs am Tierpräparat zu lokalen Lappenplastiken, was vor allem die Studierenden ansprechen soll, die eine MKG- oder oralchirurgische Weiterbildung anstreben.

No conflict of interest.

ID151

Digitale Abläufe in der Versorgung von Orbitabodenfrakturen: vom 3D-Druck bis zum individuellen Mesh

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Ein gängiges Krankheitsbild der Traumatologie in der Mund-, Kiefer- und Plastischen Gesichtschirurgie ist die Orbitabodenfraktur. Neben der Möglichkeit einer konservativen Behandlung ist bei ausgeprägten Defekten, Diplopien und Enophthalmus häufig eine chirurgische Revision notwendig. Zur Einlage nach Revision werden zumeist Polydiaxanon-Folien (PDS) verwendet, Titan-Meshes stehen jedoch auch zur Verfügung. Bei Notwendigkeit von Mesh-Verwendung wurden in unserer Abteilung digitale Workflows etabliert, welche eine präoperative Individualisierung anhand eines 3D-gedruckten Modells ermöglichen.

No conflict of interest.

ID153

ICG Clearance Kinetics as a Functional Biomarker for Liver Graft Viability During Hypothermic Oxygenated Perfusion

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Liver disease accounts for over two million deaths annually worldwide, with the majority of cases resulting from complications of chronic liver conditions such as cirrhosis, viral hepatitis, non-alcoholic steatohepatitis (NASH) and hepatocellular carcinoma. Liver transplantation remains the definitive treatment for end-stage liver failure, however, the increasing reliance on extended-criteria donors to meet growing demand has introduced greater variability in graft quality and a heightened risk of early allograft dysfunction (EAD) and primary non-function. Despite advances in preservation techniques, the field lacks standardized and reliable intra-perfusion markers to predict graft viability, particularly during hypothermic oxygenated machine perfusion (HOPE), which has gained prominence for graft reconditioning. In this prospective pilot study, we investigated the potential of indocyanine green (ICG), a well-characterized hepatobiliary tracer, as a dynamic fluorescence-based biomarker for functional liver assessment during HOPE. ICG was administered to donor livers during perfusion, followed by serial sampling of perfusate, bile and liver tissue to quantify its uptake and clearance kinetics. Livers that developed EAD post-transplant exhibited significantly impaired ICG clearance, characterized by prolonged retention in the perfusate and diminished biliary excretion. In contrast, livers with immediate function demonstrated efficient ICG metabolism and elimination. These kinetic profiles effectively distinguished between viable and compromised grafts prior to transplantation. Our findings support the integration of ICG-based fluorescence monitoring into HOPE protocols as a real-time, non-invasive tool for functional viability assessment. This method holds promise for improving graft selection, reducing post-transplant complications and enhancing clinical outcomes in liver transplantation.

No conflict of interest.

ID154

Interleukin-10 Protects Intestinal Epithelial Barrier Function by activation of the JAK1/STAT3-pathway

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Ulcerative Colitis (UC) and Crohn´s disease (CD) are the two major forms of inflammatory bowel diseases (IBD) in humans. They are multifactorial diseases arising in genetically predisposed individuals due to over-exuberant innate and adaptive immune responses. Previous data has shown that deficiencies in interleukin-10 (IL-10) or its receptor can lead to dysregulated immune responses in the gut, contributing to the development and progression of inflammatory bowel disease. Here we tested whether IL-10 has direct protective effects on intestinal epithelial cells and how these effects are mediated in an in vitro inflammation model. The human adenocarcinoma cell line HT29 B6 that is commonly used as model for intestinal epithelial cells was incubated with inflammatory cytokines (TNF-alpha, IL-1beta, IFN-gamma) to mimic inflammation. Recombinant human IL-10 was applied with and without cytokines. The expression of junctional proteins and the phosphorylation of transcription factors was evaluated in Western Blots. The integrity of the epithelial barrier was assessed by measuring the transepithelial electrical resistance (TEER). Cell viability was measured using a Luminescent Cell Viability Assay. Application of inflammatory cytokines to intestinal epithelial cells led to reduced TEER showing loss of epithelial barrier function. This was paralleled by loss of junctional protein Desmoglein-2 and upregulation of pore-forming Claudin-2. IL-10 in the concentration of 100 ng/ml attenuated inflammation-induced loss of TEER and blocked changes of junctional proteins Desmoglein-2 and Claudin-2. IL-10 application led to increased phosphorylation and activation of the JAK1/STAT3-pathway. Updacitinib and Stattic to inhibit JAK1 and STAT3 blunted all protective effects of IL-10. Our data suggest that IL-10 plays a crucial role in protecting the intestinal epithelial barrier in inflammation by activation of the JAK1/STAT3-pathway. These findings give further insights into the mechanisms by which IL-10 exerts beneficial effects in patients with IBD beyond modulation of the immune response.

No conflict of interest.

ID156

Enteric neurodegeneration leads to motility impairment during postoperative gut inflammation.

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Current studies provide compelling evidence that the enteric nervous system (ENS), together with immune cells, modulates neuroimmune processes in the gut. Previous work revealed the essential role of resident macrophages (Macs) therein. However, the closely associated enteric neurons (EN), which have an indispensable role in gut homeostasis, including gastrointestinal motility, have not been thoroughly investigated regarding their interplay with Macs during enteric neuroinflammation. Therefore, we investigated the impact of EN-Mac interactions on postoperative trauma and subsequent motility disturbances, e.g., postoperative ileus (POI). Neuroinflammation and POI were induced in various transgenic mice by surgical manipulation of the small intestine. To investigate the transcriptome of EN and Macs during gut inflammation, we used a neuron-specific RiboTag mouse and FACS-sorted CX3CR1-GFP+ Macs for cell-specific RNA-Seq analyses. To look closely at EN-Mac communication during neuroinflammation, we applied a CSFR1-antibody treatment to CX3CR1-GFP+ mice to deplete Macs and subsequently perform surgical trauma to induce POI. Ultimately, we validated the murine data in human gut samples collected early and late during abdominal surgery to understand surgical manipulation's impact on patients' ENS function. In POI mice, we detected strong neuronal activation in the initiation phase and induction of neuron proliferation and death, coinciding with synaptic degradation at the peak of the disease. The neuronal transcriptome confirmed these severe changes and verified EN's response to the inflammatory environment. Analysis of the Mac-specific transcriptome revealed a distinct neurodegenerative gene profile, pointing to a detrimental effect of the EN-Mac interaction during POI. Depletion of Macs before surgical manipulation led to decreased neuron death, less synaptic decay, and improved GI motility, emphasizing the essential role of Macs in neurodegeneration. Concurrently, we analyzed the impact of surgical trauma on EN in human patient samples. There, we detected reactive and dying neurons in ENS ganglia that displayed dysregulated gene patterns for neuronal functions, e.g., synaptic signaling and neurogenesis. Future studies on the molecular mechanisms of enteric neurodegeneration in surgical patients are warranted and will help to identify neuroprotective measures, supporting patients´ recovery from functional complications, such as motility impairment, more rapidly.

No conflict of interest.

ID157

CX3CL1 Modulates Chemotherapy Response and NK Cell Activity in Esophageal Adenocarcinoma

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Esophageal adenocarcinoma (EAC) is a highly aggressive cancer with limited therapeutic success and a poor overall prognosis. Current chemotherapy regimens achieve only moderate efficacy, with overall and partial response rates around 40%. Despite significant research efforts, no reliable biomarkers exist to predict chemotherapy response in EAC. Thus, identifying molecular markers that can guide treatment and improve patient outcomes remains a critical unmet need. CX3CL1 (Fractalkine), the sole member of the CX3C chemokine family, exists in both soluble and membrane-bound forms, functioning in leukocyte recruitment and adhesion. It has been implicated in the pathogenesis and prognosis of various cancers, including prostate, breast, and lung cancer. In this study, we investigated the role of CX3CL1 in EAC. Serum analysis from EAC patients pre- and post-chemotherapy revealed a positive association between CX3CL1 expression and therapeutic response. To explore its potential as a predictive biomarker, we measured CX3CL1 expression across four EAC cell lines using qRT-PCR, identifying FLO1 as the highest expressor. Functional experiments using siRNA-mediated knockdown of CX3CL1 in FLO1 cells followed by chemotherapy treatment demonstrated enhanced proliferation in control cells compared to CX3CL1-silenced cells, suggesting that CX3CL1 may sensitize cells to chemotherapeutic agents. Conversely, treatment with recombinant CX3CL1 enhanced drug sensitivity, further supporting its modulatory role. Given CX3CL1's ability to recruit immune effector cells, including NK cells, we also examined its interaction with $CX3CR1^{+}$ NK cells. In vitro assays showed that NK cells preferentially targeted CX3CL1-expressing tumor cells over CX3CL1-negative counterparts. Collectively, our findings highlight CX3CL1 as a potential biomarker of chemotherapy response and an enhancer of immune-mediated tumor cytotoxicity in EAC. These results offer promising avenues for developing personalized therapeutic strategies in the management of esophageal adenocarcinoma.

No conflict of interest.

ID158

Moloney Murine Leukemia virus complexed with magnetic nanoparticles efficiently targets the myocardial scar and reduces electrical vulnerability upon fibroblast specific Connexin 43 overexpression

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After a myocardial infarction (MI), dead cardiomyocytes (CM) are replaced by cardiac (myo)fibroblasts (FB), which are the predominant cell type in the newly formed scar. The loss of CM leads to impaired cardiac pump function and can result in life-threatening ventricular tachycardia (VT). Genetic manipulation of FB is a promising option for treating short- and long-term consequences of MI. However, targeting of FB remains difficult. To improve FB transduction in vitro and in vivo, Moloney mouse leukemia virus (MMLV) was complexed with magnetic nanoparticles (MNP) and applied in combination with magnetic steering. To enhance electrical conduction, the gap junction protein Connexin 43 (Cx43) was overexpressed in the cardiac scar in vivo using a newly generated MMLV construct. Non-cardiac fibroblasts (3T3-FB) and embryonic cardiac fibroblasts (eFB) were transduced in vitro with MMLV (250 virus genomes (VG)) encoding mCherry (control) or Cx43/mCherry complexed with MNP (250 fg Fe/VG) under magnet application. The FRAP technique was used to investigate the functionality of the newly formed gap junctions in vitro. In vivo, MMLV/MNP complexes were injected into the lesion area under magnetic control 3 days after cardiac cryolesion (CI). Cx43 expression was analyzed by digital PCR, Western blot (WB) and visualized by immunofluorescence. Functional measurements were performed 2- and 8-weeks after CI, and optical mapping was conducted 2 weeks after CI. In vitro analyses showed efficient transduction of 3T3-FB and eFB after application of the MMLV constructs (mCherry: 3T3-FB: 81.2%, eFB: 60.8%; Cx43/mCherry: 3T3-FB: 72.6%, eFB: 69.8%). FRAP experiments demonstrated functional gap junctions between Cx43-overexpressing FB. In vivo, efficient FB-specific Cx43 overexpression and an increased Cx43 content in the infarct zone were demonstrated by digital PCR, WB, and immunohistochemistry in MMLV-Cx43 mice. Electrophysiological tests proved a 50% reduction in VT incidence during electrophysiological testing following MMLV-Cx43/mCherry transduction 2- and 8-weeks after CI. In addition, optical mapping experiments demonstrated a lowered heterogeneity of the electrical conduction. In conclusion, MMLV/MNP magnet-based transduction of the myocardial scar is highly efficient. MMLV-mediated Cx43 gene transfer in acute CI results in strongly increased protein expression in the fibrotic scar area and hence significant anti-VT protection 2- and 8-weeks after CI and gene therapy.

No conflict of interest.

ID159

The Effects of Bidirectional Signaling Between Tumor and Neural Cells in Pancreatic Cancer

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Pancreatic ductal adenocarcinoma (PDAC) is one of the deadliest cancers with a poor prognosis. Its aggressiveness, early metastasis, and resistance to therapy are influenced by a complex tumor microenvironment comprising various immune and stromal cells, including neuronal structures. The bidirectional communication of nerve structures and tumors leads to perineural invasion (PNI), in which tumor cells invade nerve cells, promoting metastasis, tumor progression, and severe pain through various mechanisms. Since dorsal root ganglia (DRG) play a central role in pain signaling, and studies have shown an increased release of neurotrophic factors in DRGs in the early stages of cancer, DRGs, and their neuronal processes could be a key player in perineural invasion and possibly tumor progression. We established primary DRG cultures and treated them with conditioned media derived from primary pancreatic tumor cultures, generated using fresh tumor samples from an orthotopic PDAC animal model. To investigate the functional and molecular impact of tumor-derived signals on the peripheral nervous system, we analyzed the expression of inflammatory markers, neurotrophic factors, and stress-related genes in DRGs using qPCR. Additionally, immunohistochemical analysis of tissue sections from PDAC-bearing mice was performed to assess tumor-associated neuronal innervation and its correlation with tumor proximity. To evaluate structural neuronal changes, we conducted neurite outgrowth and branching analysis in primary DRG cultures exposed to PDAC-conditioned media using the quantitative image analysis software NeuronJ. Our approach aims to elucidate how PDAC-derived factors modulate DRGs and their structural properties, providing insight into the mechanisms underlying perineural invasion. This underscores the need for further investigation of DRG-tumor interactions to identify new therapeutic targets for PDAC-associated neuropathies and disease progression.

No conflict of interest.

ID160

EFFECTS OF OBESITY AND SEX ON ANASTOMOTIC HEALING AND POSTSURGICAL RECOVERY

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After the resection of colorectal tumors the transected colon needs to be resutured to preserve the intestinal continuum, thereby forming an intestinal anastomosis. However, up to 19% of patients display disturbed colorectal anastomotic healing (CAH), which subsequently leads to anastomotic leakage (CAL). Obesity and metabolic syndromes have been associated with impaired wound healing, but specific effects on anastomotic healing and the involved pathways have not yet been thoroughly investigated. Moreover, specific contributions of dietary-induced obesity versus genetic metabolic dysfunction as well as sex differences remain insufficiently understood. This study aims to describe the effects of obesity, metabolic syndromes and sex on the occurrence of CAL. To investigate the effects of obesity and metabolic dysregulation on anastomotic healing, we utilized two murine models: C57BL/6 mice fed with a high-fat diet (HF) to induce obesity, and genetically obese db/db mice, which lack functional leptin receptors and exhibit profound metabolic syndromes. Control diet (LF) and lean db/wt littermates were used as respective controls. All mice underwent standardized colonic anastomosis surgery, and healing outcomes were assessed on postoperative day (POD) 5. Metabolic status of the mice, clinical healing scores (ACS), histological differences and microbiome changes were utilized to describe healing differences. HF induced obesity after 8 weeks, accompanied by developing metabolic syndromes, albeit no elevated %Hba1c. While we detected no difference in ACS and leakage between HF/LF males, these values were on par with HF females and all of them were significantly higher than LF females. Leptin-deficient mice exhibited morbid obesity and profound metabolic dysfunctions, leading to massively impaired CAH with increased mortality rates and high ACS. Obesity and male sex correlated with worsened postsurgical outcome, such as well-being and weight recovery. Obesity, exacerbated by an array of metabolic syndromes, severely impacts CAH and leads to elevated CAL. As the initial risk for males is already higher than that of females, potentially due to microbiome interactions, obesity affects CAH in females stronger than in males. Further investigation of involved pathways, especially those connecting diet and the microbiome, such as AhR need to be explored to develop sex-specific interventions.

No conflict of interest.

ID161

EVALUATION OF THE INFLAMMATORY PROPERTIES OF IP-VISIO- AND IP-S-PRINTED SURFACES

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Artificial biohybrid organs are developed as screening tools to test new drug candidates and as new options for organ replacement. They are typically composed of printed scaffolds for parenchymal cells derived from primary cells or cell lines. Due to the diffusion limits of oxygen, carbon dioxide, nutrients, and metabolites, artificial vascular networks are needed to ascertain the survival and proper function of the parenchymal cells. The biocompatibility of vascular networks is highly relevant, as they will be perfused with blood in vitro or after implantation in vivo. Here, we compare the pro- or anti-inflammatory properties of two different photoresins, which are suited to print three-dimensional networks, using human macrophages derived from the monocytic cell line THP-1. Two-dimensional IP-Visio and IP-S surfaces were printed by two-photon stereolithography on indium tin oxide-coated glass. Human monocytic THP-1 cells were differentiated into macrophages by phorbol 12-myristate 13-acetate and further polarized towards an M1-like phenotype in the presence of lipopolysaccharide and interferon-γ. Cells were cultivated on four different surfaces: normal glass as a control, indium tin oxide-coated glass, IP-Visio, and IP-S. To induce cytokine release, cells were primed with lipopolysaccharide and further stimulated with the ATP receptor agonist BzATP or the pore-forming bacterial toxin nigericin. Interleukin (IL)-1β and IL-6 were measured in cell culture supernatants by enzyme-linked immunosorbent assay and cell viability was estimated by the measurement of lactate dehydrogenase activity. In response to lipopolysaccharide, M1-like macrophages cultivated on glass released IL-6 and further stimulation with BzATP or nigericin led to the release of IL-1β. Neither cultivation on indium tin oxide nor IP-Visio caused changes in cytokine release compared to glass. Only upon cultivation on IP-S surface, a small but statistically significant reduction of IL-1β release was seen, when cells were stimulated with lipopolysaccharide and nigericin. Cell viability did not differ among the experimental settings investigated. We conclude, that neither IP-Visio nor IP-S exert strong pro- or anti-inflammatory effects on M1-like macrophages. This is a first hint that both photoresins are suitable for printing vascular networks for biohybrid organs.

No conflict of interest.

ID162

METARYL CLINICAL TRIAL: NUTRITION AND AHR ACTIVATION IN MESENTERIC ADIPOSE TISSUE INFLAMMATION AND INTESTINAL SURGICAL SITE INFECTIONS IN METABOLIC SYNDROME

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Surgical resection requires subsequent reconnection to preserve the intestinal continuum, thereby forming an anastomosis. However, anastomotic healing (AH) is impaired in up to 19% of patients, which subsequently leads to anastomotic leakage (AL). Obesity and metabolic syndromes, such as type 2 diabetes (T2D), have been associated with impaired wound healing and pose a significant postoperative risk. However, the mechanisms underlying this relationship remain unclear. Tryptophan (Trp), an essential amino acid derived from dietary intake of protein-rich food, gets metabolized by microbial communities into indole derivatives, which can act as agonists of the aryl hydrocarbon receptor (AhR). AhR activation plays a central role in intestinal epithelial homeostasis and becomes disturbed during metabolic diseases. Our clinical trial aims to investigate the interaction between diet related tryptophan metabolites in obese patients and AH, by describing the effects of obesity, metabolic syndromes and sex on the occurrence of AL. Therefore, inflamed adipose tissue is analysed by histology and single-nuclei sequencing to determine its interaction with diet- and microbiota-derived Trp metabolites, and ultimately its role in AL. Targeted Trp metabolite analysis in pre- and post-operative faecal and blood samples will be correlated with the outcome of bariatric surgery. Shotgun analyses in preoperative faecal samples will be used to characterize the microbiome. Sample collection: 150 patients, ~50% displaying T2D, will undergo Roux-Y-bypass surgery. Blood and stool samples are collected on both preoperative visits as well as longitudinally on postoperative visits (POV) for two years. Intraoperatively, we collect ileal tissue, as well as omental and visceral fat. Recruitment has reached 43% after the first 18 months, with 89% of these patients contributing to sample collection on POV2 (2-5W), 68% on POV3 (3-6M), and 28% on POV4 (12M). Recruitment and postoperative follow-up are ongoing. Societal impact: Lower CAL incidence will significantly reduce mortality and shorten hospital stays, which will improve quality of life and reduce socioeconomic costs. Preoperative metabolic signatures might help to predict the outcome of bariatric surgery and present alternative treatment options for patients at risk of leakage.

No conflict of interest.

ID163

NLRP3 inflammasome inhibition enhances engraftment of transplanted embryonic cardiomyocytes and preserves cardiac pump function in a murine model of myocardial infarction

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Loss of cardiomyocytes (CM) after myocardial infarction (MI) causes loss of function of the heart due to the lack of regenerative capacity of CM. Therefore, cell replacement therapy may offer a causal therapy to treat the consequences of MI. However, transplantation and long-term engraftment of viable, contractile cells into the cardiac lesion has proven challenging so far. The healing response after MI is highly coordinated and greatly influences the development of the cardiac scar as well as engraftment of transplanted cells. The NLRP3 inflammasome becomes activated in response to cell damage caused by ischaemia. Inhibition of NLRP3 has already been proven beneficial after MI, reducing infarct size and improving cardiac function. Consequently, inhibition of the NLRP3 inflammasome post-MI may improve long-term engraftment of intramyocardially injected embryonic cardiomyocytes (eCM) and improve cardiac pump function. MI was induced in 10 – 12 week old, female C57 Bl/6 J mice through permanent ligation of the left anterior descending coronary artery (LADx) and magnetic nano-particle (MNP) loaded eCM were intramyocardially injected under the influence of a magnetic field. Mice were treated with the NLRP3 inhibitor MCC950 (20 mg/kg, i.p. intraoperatively and every other day thereafter). Cardiac pump function was assessed by echocardiography and pressure-volume catheter measurements 14 days post-MI. Infarction volume and eCM engraftment were analysed histologically 14 d post-MI; cell death and proliferation, as well as NLRP3 and IL-1β expression, were quantified in histological heart sections 1 and 3 d post-MI. Mice treated with eCM+MCC950 showed significantly higher cell engraftment 14 d post-MI compared to eCM alone. MCC950 treatment alone showed improved cardiac pump function, but left ventricular ejection fraction was significantly preserved when combining eCM+MCC950. MCC950 treatment also resulted in reduced incidence of transmural lesions. Furthermore, MCC950 treated mice showed lower numbers of dying cells 1d post-MI and reduced proliferation of fibroblasts and leukocytes 3d post-MI compared to LADx. Finally, hearts of MCC950 treated mice showed significantly reduced NLRP3 and cleaved IL-1β expression 3d post-MI as well as reduced leukocyte infiltration into the lesion. In conclusion, NLRP3 inflammasome inhibition by MCC950 can significantly improve eCM engraftment after intramyocardial injection and cardiac pump function through enhanced CM survival and altered scar development.

No conflict of interest.

ID164

PRESS -PAR: Early detection and PREvention of Symptomatic postSurgical hypoPARathyroidism after thyroid surgery

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A common complication, particularly following bilateral thyroid surgery, is the development of postoperative hypoparathyroidism (HPT) which reduces patients' quality of life. The German AWMF S2k guideline recommends determining calcium and parathyroid hormone (PTH) levels either immediately postoperatively or on the first postoperative day. It has not been systematically assessed whether PTH measurements followed by immediate vitamin D and calcium supplementation is an effective approach to prevent symptomatic postsurgical hypothyroidism after bilateral thyroid surgery. Therefore we designed a single-center randomized prospective study named PRES-PAR (Early detection and PREvention of Symptomatic postSurgical hypoPARathyroidism after thyroid surgery) to answer this question. Here we report the first results after inclusion of 38 patients. Inclusion criteria are bilateral thyroid surgery in adults without a history of parathyroid disease. Patients are randomized into PTH/Calcium measurements either within two hours after surgery or on the first day after surgery, respectively. Patients with PTH levels below the limit of 12 pg/ml immediately receive activated Vitamin D and Calcium orally. Preliminary evaluation of the first 38 patients revealed that basic patient characteristics including the indications for surgery and comorbidities did not differ. Biochemical HPT (PTH levels lower than 12 pg/ml) was similarly high in both groups following bilateral surgery (41.2% on day 1 compared to 43% on day 0). However, none of the patients in the day 0 group developed symptomatic HPT, compared to three in the day 1 group. This resulted in a slightly longer hospital stay (3.4 ± 0.9 days for the day 1 group versus 3.0 ± 0.2 days for the day 0 group). One patient in the day 1 group even required intravenous calcium to prevent severe symptoms. Overall, our preliminary evaluation of this prospective randomized interventional study suggests that patients benefit from an early determination of PTH following by immediate thyroidectomy.

No conflict of interest.

ID165

Evaluation of a digital health application to increase compliance and empowerment in patients with short bowel syndrome and home parenteral nutrition: results of a pilot study

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Short bowel syndrome (SBS) is a major challenge for both patients and the medical staff treating them. Many patients with short bowel syndrome are unable to maintain their natural homeostasis through oral nutrition. As a result, many short bowel syndrome patients are dependent on long-term or even permanent parenteral nutrition. In particular, monitoring patients with home parenteral nutrition (HPN) with specific requirements is a significant challenge, as there are only few specialised centres for this patient group and long journeys are often required. This pilot study is investigating a newly developed digital health application (app) to improve monitoring in HPN patients. The aim of the study is to determine whether the application has a positive influence on patients' nutritional management and increases compliance as well as safety and empowerment of patients in dealing with their disease. In addition, this project aims to investigate the general feasibility and effectiveness of app-based approaches to monitoring chronic diseases using short-bowel syndrom as an example. The app was developed and tested in three phases working with a multidisciplinary team. First, we developed a basic app framework and evaluated possible features together with SBS patients. After this prototype was tested within the team, we tested the functionality and user-friendliness of the app with two groups of test subjects of different age groups (5 and 6 test subjects). The third phase is currently being conducted with patients affected by SBS. The data to date indicates a high level of acceptance and effectiveness of the digital health application, meaning that successful validation in the third phase is very likely. The effects on compliance and empowerment in dealing with the disease will be evaluated in the further course of the current phase. The results of the first two groups give rise to the assumption that patients do benefit from using the app. During phase three, patient feedback is systematically recorded. If necessary, there will be follow-up tests with patients in order to evaluate the feedback collected and the features of the app adapted accordingly. Overall, the app shows promising potential as a monitoring tool for HPN patients. In the future, it could be used for the systematic evaluation of possible pharmacotherapy or treatment. Further studies with larger samples are required to validate the long-term effects and further develop the application.

No conflict of interest.

ID166

Local Gs-protein-mediated activation of enteric glial cells via optogenetics in a transgenic mouse model

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Enteric glial cells (EGCs) are increasingly recognized as active modulators of intestinal immune responses and inflammatory processes. Previous work from our group demonstrated that sympathetic innervation, via β-adrenergic receptors, can initiate immune-related activation of EGCs during the early phase of intestinal inflammation. To investigate the specific contribution of Gs-protein-coupled signaling in EGCs, we established a transgenic mouse model (Sox10^CreERT2 × JellyOp), in which a light-sensitive, Gs-coupled opsin (JellyOp) is selectively expressed in EGCs upon tamoxifen induction. This enables precise temporal control of EGC activation via intracolonic optogenetic stimulation. Blue-light stimulation was applied transanally for 30 minutes in anesthetized mice using a 1.5 mm LED diffuser. Stimulation parameters included variations in pulse duration, frequency, and light intensity (0.013, 0.07, 0.13 mW/mm²). One hour post-stimulation, full-thickness colonic tissue was snap-frozen or processed for whole-mount staining. To assess glial and neuronal activation, we analyzed the expression of c-Fos, GFAP, IL-6, and CCL2 using quantitative PCR. Western blot analysis focused on phosphorylated PKA substrates as downstream effectors of Gs signaling. In addition, phosphorylated CREB and c-Fos were co-stained with Sox10 and ANNA-1 in immunohistochemistry to spatially localize Gs-dependent signaling specifically to enteric glial cells. To evaluate potential tissue damage due to device insertion or light exposure, H&E-stained sections of the colon were examined for immune cell infiltration and structural alterations. Initial IHC analysis revealed inconsistent expression patterns of pCREB and c-Fos in enteric glial cells across both experimental and control groups, ranging from 0–100%, indicating high baseline activation and limiting interpretability. Adjustments in stimulation parameters (increased intensity, removal of frequency modulation) did not yield statistically significant differences in molecular or cellular readouts across qPCR, Western blot, or IHC. Importantly, H&E staining revealed no signs of tissue damage or inflammation. These findings suggest that basal activation levels in colonic ganglia may mask optogenetically induced effects, or that stimulation intensity remains subthreshold for robust activation. Nevertheless, this study demonstrates the technical feasibility and specificity of optogenetic manipulation of EGCs in vivo. Further refinement of stimulation protocols and readout sensitivity will be required to elucidate the functional contributions of EGCs in enteric neuroimmune interactions.

No conflict of interest.

ID167

Refinement and Replacement in Aortic Research

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Modeling aortic diseases such as abdominal aortic aneurysms (AAA) is challenging due to the disease's multifactorial nature and associated comorbidities. Large animal models remain essential for translational research offering high anatomical and pathophysiological relevance. However, surgical standardization and ethical considerations remain significant hurdles. We refined an established porcine AAA model to improve procedural consistency while prioritizing animal welfare. AAA was induced in 24 male Landrace and Cardio pigs through a combination of systemic oral β-aminopropionitrile (BAPN), intraoperative balloon dilatation, and intraluminal administration of elastase and collagenase. Key surgical refinements included replacing laparotomy with a retroperitoneal approach to reduce trauma. Also, instead of a permanent lumbar artery occlusion, a temporary occlusion was performed to minimize the risk of spinal ischemia. Additionally, a sheath (Cook Medical®) placed directly into the abdominal aorta preserved caudal mesenteric perfusion during integrity testing of clamped aortic segments. It also prevented leakage and ensured hemodynamic stability and pressure-controlled enzyme delivery to the abdominal aorta. These refinements eliminated postoperative paresis, prevented cardiovascular instability and enabled full recovery within 3–4 days without complications. Complementary ex-vivo approaches such as bioreactors offer great replacement potential. We present a three-dimensional ex vivo bioreactor perfusion system designed for macrovascular structures, which can be adapted to a range of experimental conditions to investigate hypotheses within the field of vascular biology. To date, vascular cells within the perfused arterial segments have remained viable for up to seven days. The introduced approaches highlight the importance of close interdisciplinary collaboration among vascular surgeons, veterinarians and basic scientists to improve the scientific validity of aortic in vivo and ex vivo models while adhering to the highest standards of animal welfare.

No conflict of interest.

ID168

Evaluation of an Evidence-Based Self-Assisted Physiotherapy Approach to Scapulothoracic Dyskinesis: A Pilot Study

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Scapulothoracic dyskinesis (SD) is a symptomatic condition associated with various shoulder pathologies. Current treatments are predominantly based on expert opinions, with limited high-quality evidence supporting their efficacy. This study aimed to evaluate a physiotherapy intervention for SD, developed through a systematic literature review and tested in a pilot study. A systematic literature search was conducted in PubMed to identify randomized controlled trials (RCTs) published in the last ten years that focused on non-invasive therapies and exercises for SD. Inclusion criteria were conservative interventions targeting SD, while exclusion criteria ruled out invasive treatments, alternative therapies, and non-randomized studies. The quality of included studies was assessed using the modified Coleman Methodology Score (mCMS). Based on the findings, a six-week evidence-based home training program was developed and evaluated in a pilot study including patients with SD and no other associated shoulder pathologies requiring specific treatment. Measurements included strength tests (IsoForceControl® Evo2), dynamic rasterstereography (DRS), electromyography (EMG), and patient-reported outcomes using QuickDASH, Nottingham Clavicle Score (NCS), Freiburg Questionnaire on Physical Activity (FQPA), physical activity enjoyment scale (PACES-S) and the "Sport-Related Barrier Management" scale. Data were collected at baseline, three weeks, and six weeks. Sixteen studies with 1,301 patients were included, with an average mCMS of 47.5 ± 6.35. An additional six relevant studies were used to support the training program design. Nineteen participants (58% male; mean age 40.93 years; BMI 30.37) were enrolled in the pilot study. The results indicated a trend toward improvement in NCS and FQPA scores and a reduction in PACES-S scores, though statistical significance was not achieved. No relevant changes were observed in other measures and in the DRS observations. The pilot study demonstrated that a self-assisted, evidence-based home training program for SD is feasible and associated with trends toward improvement in specific functional outcomes. However, the lack of significant findings highlights the need for further optimization and larger cohorts to confirm efficacy. Enhanced engagement strategies may also address barriers to physical activity enjoyment and improve adherence.

No conflict of interest.

ID169

International multicenter Study of Real-Worl Outcomes in Minimally Invasive Resection of Non-small Cell Lung Cancer after Chemoimmunotherapy

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Our aim was to evaluate real-world outcomes of minimally invasive surgery (MIS) compared to open resection in patients with non-small cell lung cancer (NSCLC) after neoadjuvant chemoimmunotherapy, with a focus on treatment response. Data were collected from five medical centers in the United States and Germany, encompassing all patients who underwent surgical resection for NSCLC after receiving neoadjuvant chemoimmunotherapy between 2000 and 2024. We analyzed clinical and pathological factors influencing the choice of MIS and compared the outcomes of MIS versus open surgical approaches. The study included 207 patients, of whom 164 (79.2%) underwent MIS and 43 (20.8%) had open resections. MIS was predominantly utilized for lobectomy procedures (93.9% vs. 58.8% in open surgery), whereas it was less frequently performed for bilobectomy (2.6% vs. 14.7%) or pneumonectomy (2.6% vs. 26.5%), with a significant difference ($p<0.0001$). Conversion to thoracotomy occurred less often in robotic-assisted surgeries compared to video-assisted thoracoscopic surgeries (4.5% vs. 31%, $p=0.001$). Larger residual tumors (ypT3/4) were more often resected via open surgery (MIS 8.5% vs. open 32.5%, $p=0.0002$). Achieving a complete pathological response was an independent predictor for selecting MIS (odds ratio 10.81; 95% confidence interval 2.71–43.20; $p=0.001$). R0 resection was accomplished in 96.1% of cases overall, with a higher rate in MIS (98.2%) compared to open surgery (88.4%, $p=0.003$). Patients undergoing MIS experienced shorter hospital stays (median of 2.2 days vs. 3.9 days, $p=0.0009$) and fewer major complications (9.1% vs. 25.6%, $p=0.038$). The 60-day postoperative mortality rate was 1%. Minimally invasive surgical approaches are feasible for most patients after neoadjuvant chemoimmunotherapy, particularly in cases with complete pathological response. These techniques are associated with high rates of complete tumor resection and quicker recovery times. Conversely, open surgery tends to be reserved for patients with larger residual tumors or those requiring more extensive resections.

No conflict of interest.

ID170

From primary to lymph node: Spatially resolving cancer cell subtypes and their TME in PDAC

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Pancreatic ductal adenocarcinoma (PDAC) is among the deadliest cancers with a 5-year survival rate of ~13% and is projected to become the second leading cause of cancer-related death by 2030. Lymph node (LN) metastasis strongly predicts early recurrence and poor prognosis. Yet, the mechanisms of lymphatic spread and its role in immune evasion remain largely unknown. While single-cell RNA-sequencing (scRNA-seq) has advanced our understanding of tumor biology, it lacks spatial context. Spatial transcriptomics (ST) now enables spatially resolved analysis of cancer cell subtypes and their microenvironment. We analyzed matched FFPE tissue from 6 patients with resected pTxN2M0 PDAC, including primary tumors, tumor-infiltrated LNs (tiLNs), and non-infiltrated LNs (niLNs). Sections (n=18) were processed using the 10x Genomics Xenium platform with a 480-gene customized Immuno-Oncology panel. Data was analyzed with Seurat (R) and Python using unsupervised. clustering to identified cancer and immune/stromal cell populations. Cell-cell proximity was analyzed using PROSEG and dbscan-based nearest-neighbor algorithms (radius: 20 µm). We identified distinct PDAC cell subtypes—basal, classical, and intermediate— conserved in both primary tumors and tiLNs. The tiLN microenvironment itself exhibited a heterogeneous composition of T, B, NK cells, macrophages, and fibroblasts. Notably, spatial mapping and proximity analysis revealed that cancer cells in tiLNs were consistently surrounded by myofibroblastic Cancer-associated Fibroblasts (myCAFs), forming a shielding layer around tumor cells. This spatial arrangement suggests a potential role for myCAFs in lymphatic metastasis of PDAC. This is one of the first studies to spatially resolve matched primary PDAC and tiLN tissue. We demonstrate that cancer cell heterogeneity persists in LN metastases and uncover a protective CAF barrier around cancer cells of tiLNs. These findings suggest a potential role for CAF subtypes in immune evasion and LN colonization. Ongoing analyses of APCs and T cells aim to further elucidate mechanisms of nodal infiltration and immune modulation. Our data provide a spatial framework for understanding LN metastasis in PDAC and may guide the development of subtype-specific therapeutics.

No conflict of interest.

ID171

3D-Navigations-Hybrid OP in der Unfall- und Wirbelsäulenchirurgie in einem überregionalen Traumazentrum

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Der Fortschritt bestehend aus modernen Lösungen hält auch in der Unfall- und Wirbelsäulenchirurige einzug. Stellvertretend dafür können die Navigation sowie die Robotik gesehen werde. Beide Methoden können einzeln oder im Zusammenspiel neue Möglichkeiten eröffnen, Operationen durchzuführen. Wir berichten über unsere Erfahrungen mit einem 3D-Navigaitons-Hybrid OP in 210 Fällen in der Unfall- und Wirbelsäulenchirurgie in einem überregionalen Traumazentrum. Prospektive Datenerhebung in den ersten zwei Jahren nach der Implementierung des Hybrid-OPs. Dieser besteht aus einer Navigationseinheit, einem Roboterarm, einem robotischen und fahrbaren cone beam CT und Mixed-Reality Brillen zur Planung. Es wurden Operationen an der Wirbelsäule, am Becken (Beckenring und Acetabulum) und an den Extremitäten durchgeführt. Es wurden demographische und deskriptive Daten erhoben wie auch die Genauigkeit der Platzierten Schrauben quantifiziert. An der Wirbelsäule mittels Gertzbein und Robbins Klassifikation, an den übrigen Eingriffsbereichen auf Basis des Vergleichs der präoperativen Planung mit der postoperativen Schraubenlage. 210 Patienten (118 männlich/92 weiblich) wurden in einem Zeitraum von zwei Jahren in unserem Hybrid-OP operiert. Dabei wurden 1171 Schrauben platziert. 1035 an der Wirbelsäule mit einer Genauigkeit von 98,7% (KI95%: 98,1%-99,4%) und 136 Schrauben in anderen Eingriffsbereichen mit einer Genauigkeit von 99,3% (KI95%: 97,8 -99,9%). Daraus resultiert eine Genauigkeit der Schraubenplatzierung von 98,8% (KI95%: 98,2%-99,4%). Die Benutzung des Roboterarms erfolgte in152 Fällen (72,4%). Wundinfektionen traten bei 4 Patienten (1,9%) auf. 23 (11,0%) von 210 Patienten waren dabei schwerverletzte Patienten und erreichten unsere Klinik über den Schockraum, mit einem mittleren ISS von 25,7.Im Gesamten waren keine Revisionen nötig. Die Implementierung und erfolgreiche Anwendung eines 3D-Navigations-Hybrid-OPs kann in einem überregionalen Traumazentrum gelingen. Dabei ermöglicht der Hybrid-OP eine hohe Genauigkeit in der Schraubenplatzierung für ein breites Patientengut bei einer gleichzeitig niedrigen Komplikationsrate.

No conflict of interest.

ID172

Vorhersage von Typ-2-Endoleckagen nach endovaskulärer Aneurysmaausschaltung anhand der präoperativen Computertomographie-Angiographie

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Ziel der Studie war es, anhand von präoperativen Computertomographie-Angiographien (CTA) ein Modell zur Prädiktion von Typ-2-Endoleckagen (EL2) nach endovaskulärer Aneurysmaausschaltung (EVAR) zu entwickeln. Die Untersuchung war eine multizentrische, retrospektive Analyse auf Grundlage prospektiv gesammelter Daten aus dem Zenith Alpha for Aneurysm Repair (ZEPHYR)-Register. Eingeschlossen wurden Patienten mit abdominellem Aortenaneurysma, die zwischen 2016 und 2019 an 14 europäischen Zentren mit dem Zenith Alpha Abdominal Stentgraft (Cook Medical, Bloomington, USA) versorgt wurden. Anhand klinischer Beobachtungen und in der Literatur beschriebener Faktoren, wurden 45 morphologische Parameter als mögliche Prädiktoren definiert. Die finale Auswahl erfolgte nach klinischer Praktikabilität und statistischen Trennschärfen, gemessen anhand der Fläche unter der Kurve (AUC) und geschätzt mittels 10-facher Kreuzvalidierung. Die Erhebung des EL2-Status erfolgte durch eine zentrale Befundungseinrichtung (Corelab) (Syntactx, New York, USA). Die Auswertung der CTA war verblindet hinsichtlich des EL2-Status. Der Risikoscore (EL2Score) wurde mithilfe einer logistischen Regression entwickelt. Die Evaluierung seiner Vorhersagekraft erfolgte mittels Receiver-Operating-Characteristics (ROC)-Kurvenanalyse, Sensitivität und Spezifität, positivem (PPW) und negativem prädiktivem Wert (NPW). Von insgesamt 245 Patienten zeigten 96 (39,2 %) ein EL2. Für das endgültige Modell ergaben sich folgende Parameter: der Durchmesser der A. mesenterica inferior (IMA, in mm), die Offenheit der A. sacralis mediana, die Anzahl der offenen Lumbalarterien (NLumb) und der offenen akzessorischen Nierenarterien (NAccR). Die Formel zur Prädiktion lautete: EL2Score=18×IMA+25×MSA+13×NAccR+16×NLumb. Der mittlere Score betrug 119,5 (Standardabweichung, SD 58,6). Bei EL2-Patienten 152,8 (SD 46,4) gegenüber 98,0 (SD 55,5) bei Patienten ohne EL2 (p <= 0,01). Die AUC betrug 0,78. Bei einem Schwellenwert von 120 (Youden-Index) zeigten 128 Patienten (52,3 %) einen Score >=120 (EL2-Rate: 61,1 %) gegenüber 117 Patienten mit einem Score < 120 (EL2-Rate: 16,7 %). Sensitivität, Spezifität, PPW und NPW betrugen 0,81, 0,66, 0,61 bzw. 0,84. Der definierte Score zeigte eine gute Trennschärfe zur Prädiktion von EL2 nach EVAR und könnte zur Identifikation von Patienten beitragen, die von einer präoperativen Embolisation profitieren. Eine externe Validierung steht aus.

No conflict of interest.

ID173

The role of glia cell line-derived neurotrophic factor (GDNF) during intestinal inflammation

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Enteric neurons and glia (EGC), as part of the enteric nervous system (ENS), are known to control gut inflammation and epithelial barrier integrity and function. Disrupted glial-neuron communication can result in gut disorders and intestinal inflammation. An important function of EGC is the support of the neurons with neurotrophic factors to withstand occurring stress. Glial cell line-derived neurotrophic factor (GDNF) plays a crucial role in neural recovery and simultaneously controls epithelial integrity, but the relevant cellular source of GNDF in inflammation is unknown. This work aims to study the role of glial-derived GDNF within a murine colitis and colitis-induced colorectal cancer model and in colonic organoids (colonoids). Methods: Glia-specific GDNF-KO mice (Sox10CreERT2xGDNFfl/fl) were subjected to Dextran Sulfate Sodium (DSS) treatment to induce colitis. Afterward, they were analyzed for infiltration of immune cells, inflammation, and histological changes. As chronic intestinal inflammation is tightly associated with cancer development, an additional AOM/DSS model was employed to elucidate the effect of glial-derived GDNF also in colitis-induced cancer. In the colonoid model, colonoids were treated with GDNF in the presence of LPS, and RNA expression and morphological alterations were evaluated. Results: Under naive conditions, glial-specific GDNF-deficient mice showed no phenotype. However, conditional GDNF-KO mice showed pronounced clinical signs of gut inflammation in both DSS and AOM/DSS models, reflected by higher colonoscopy scores and more frequent hematochezia. Additionally, tumor scoring analysis in the AOM/DSS model revealed elevated tumor counts in GDNF-deficient mice compared to their Cre-negative littermates. Immunohistology supported these results, showing an increased colonic immune cell infiltration simultaneously with a substantial loss of enteric neurons. In vitro, the GDNF-treated organoids grew faster and exhibited less LPS-induced permeability and less cellular swelling. RNA-Seq analysis further showed that GDNF downregulated LPS-signaling- and immune response-related transcriptional pathways in the colonoids. Overall, the present study enhances our understanding of the role of glial-derived GDNF in colonic inflammation, highlighting its involvement in the migration of immune cells, intestinal regeneration, and epithelial barrier protection. Hence, these research data may suggest new therapeutic strategies for treating inflammatory gut diseases by GDNF.

No conflict of interest.

ID174

Cancer-Associated Fibroblast-Mediated Chemoresistance in Esophageal Adenocarcinoma: Unraveling Cellular Plasticity Dynamics in the Tumor Microenvironment

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Esophageal adenocarcinoma (EAC) is among the most aggressive gastrointestinal malignancies, with increasing incidence in Western countries and a high cancer-related mortality worldwide. Recent studies highlight the pivotal role of cancer-associated fibroblasts (CAFs) in driving tumor progression, migration and therapy resistance, yet the underlying mechanisms remain poorly understood in EAC. This study investigates the influence of CAFs on chemoresistance and invasive phenotypes in EAC and aims to define a CAF-specific gene-panel associated with therapy resistance. EAC tumor cells and six Patient-derived CAFs were used to establish mono- and co-culture models to assess cell viability and migration. We also developed in vitro (radio-)chemotherapy protocols based on the clinically relevant CROSS and FLOT regimens, applied within these co-culture models to better simulate tumor-stroma interactions. In parallel RT-qPCR analyses were performed using a custom-designed EAC CAF specific gene panel, including genes like IL6, GDF15, TGF-Beta etc. Cytotoxicity assays revealed that EAC tumor cell lines exhibit significantly increased chemoresistance when co-cultured with primary CAFs. In parallel, scratch assays demonstrated an enhanced migratory capacity of tumor cells in the presence of CAFs. Supporting these findings, RT-qPCR analyses revealed dysregulation of several resistance-associated genes, including IL6, GDF15, αSMA, as well as CDH1 and CDH2 related to EMT. Together, these interim results indicate the role of CAF-tumor interactions in promoting EAC progression and treatment resistance. Ongoing analyses aim to further characterize CAF heterogeneity and uncover targetable signaling mechanisms underlying CAF-mediated resistance. These insights may inform novel combinatorial strategies that integrate stromal modulation to enhance the efficacy of current treatment regimens in EAC.

No conflict of interest.

ID175

Prospective multicenter registry study on sacropexy using the semitendinosus tendon for apical prolapse repair – an interim analysis.

Schroeder, C.[1], Hornemann, A.[2], Holthaus, B.[3], Engler, V.[2], Bosserhoff, M.[2], Coltan, L.[2], Rüger, J.[2], Voss, M.[4], Oezer, S.[4], Panczak, K.[4], Widschwendter, P.[5], Andraschofsky, T.O,[5], Stephan, J.[5], Rothmund, R.[6], Sajjadi Maeder. K.[6], Tascón Padrón, L.[1], Otten, L.A.[1], Mustea, A.[1], Koensgen, D.[1]

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Apical pelvic organ prolapse (aPOP) remains a common indication for surgical repair. While conservative treatments help in early stages, surgery is often required to treat advanced stages. As a standard, synthetic meshes are used for fixation, which can often lead to serious complications such as perforation and fistula. A novel approach utilizing the semitendinosus tendon in laparoscopic or robotic-assisted sacropexy offers a native tissue solution for apical suspension. This prospective, multicenter registry study from Germany, Switzerland and Austria evaluates the safety and effectiveness of this technique. We present an interim analysis of the first 488 patients. Since March 2023, six centers have enrolled patients ≥18 years with POP-Q (pelvic organ prolapse quantification system) point C ≥ -1 and a normal PAP smear. Preoperative, 3-month (FU3), and 12-month (FU12) assessments include clinical examination and the validated German Pelvic Floor Questionnaire. Statistical analysis used the Friedman test, $p < 0.05$ was defined as statistically significant. Of 488 patients (median BMI: 24.2 kg/m²), 48% presented with grade II and 20% with grade III/IV apical prolapse. In all cases, the semitendinosus tendon was harvested (median extraction time: 6 min) and used for sacropexy. The tendon was harvested from the right in 64% and from the left thigh in 31%. In more than 90% the tendon was splitted and only half the width of it harvested. Surgical variations included hysteropexy (53%), cervicopexy (29%), and colpopexy (13%). Concomitant colporrhaphy was performed in 83%. Intraoperative complications occurred in 2.45% (e.g., bladder, ureteral, intestinal injuries), and postoperative complications in 5.5%, including knee infection (2.1%) and voiding dysfunction (1.5%). Duration of hospitalisation was on average 4 days (range 1-33). At FU3 (n = 297), 93% had no apical prolapse (POP-Q point C grade 0+1), and recurrence (point C ≥ 1) was 1.6%. At FU12 (n = 102), 96% remained with POP-Q point C grade 0 or 1, and apical recurrence was 3% (point C ≥ 1). The reoperation rate for prolapse was 3.1%. De-novo incontinence was low at FU3 (stress incontinence n = 9, 1.9% and urge incontinence n = 22, 4.6%) and absent at FU12. Objective outcomes were supported by significant improvements in all German pelvic floor questionnaire domains, including bladder, bowel, prolapse, and sexuality scores ($p < 0.001$ to $p = 0.005$). This interim analysis demonstrates that sacropexy with the semitendinosus tendon is a safe and effective option for apical POP repair. The technique yields low complication and recurrence rates and significant improvements in patient-reported outcomes. No severe impairment of leg mobility was observed.

No conflict of interest.

ID176

Smart ICU Planning in Head and Neck Surgery: Translating Surgical Complexity into Predictive Insight

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Accurate preoperative risk stratification remains a key challenge in head and neck cancer surgery. Conventional risk scores often fail to capture the procedural complexity and specific surgical risks associated with intraoral tumor resections. To address this gap, we developed a mathematically modeled, surgery-specific index – the Tumor Risk Score (TRS) – enabling individualized prediction of postoperative intensive care requirements. In a retrospective cohort of 547 patients undergoing surgery for intraoral malignancies, tumor size, location, and invasiveness were integrated into a predictive scoring model. The TRS and baseline patient variables (age, comorbidities, BMI, hemoglobin levels, etc.) were analyzed in relation to two clinical endpoints: (1) prolonged ICU/intermediate care (IMC) stay and (2) extended total hospital length of stay (LOS). The TRS's predictive accuracy was compared to established scoring systems (ASA, CCI, FCI, PCCL). The TRS showed strong correlation with operative time ($p<0.001$) and LOS ($p=0.001$). Each incremental increase in TRS was associated with a 1.9-day increase in LOS and a 32.3% higher likelihood of prolonged ICU/IMC stay ($p<0.001$). Compared to established scores, the TRS demonstrated superior predictive performance for ICU/IMC utilization ($p=0.031$). Prolonged ICU stays were in turn significantly associated with hospital stays exceeding upper DRG-based reimbursement thresholds. The TRS offers a data-driven tool for objective, procedure-specific risk assessment in head and neck tumor surgery. It exemplifies the evolving role of statistical modeling in surgical decision-making and resource planning, aligning with the broader shift towards digital, predictive, and economically sustainable healthcare systems.

No conflict of interest.

ID177

From Experience to Data: 3D Follow-Up and Morphometric Insights in Craniosynostosis Surgery

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Precise and reproducible evaluation of cranial morphology is essential for surgical planning and long-term outcome assessment in patients with craniosynostosis. In this study, we present a longitudinal 3D morphometric follow-up of 86 children with various types of nonsyndromic craniosynostosis, compared to 50 age-matched healthy controls. Using standardized 3D surface scans at 3, 6, 12, 18, and 30 months, pathology-specific angular and linear parameters were quantified and contrasted with normative growth trajectories. Differences between open and endoscopic surgical techniques were also assessed. Beyond conventional morphometric comparisons, we introduce a mathematical approach for symmetry evaluation that does not rely on predefined anatomical landmarks, which are often distorted in craniosynostosis. Instead, the symmetry axis is derived algebraically from a central point and paired semi-landmarks, allowing for individualized and geometry-based outcome analysis. This enables consistent symmetry assessment even in cases with significant anatomical variation. Patients with plagiocephaly demonstrated significant improvements in anterior cranial symmetry following fronto-orbital advancement (FOA), with stable results at one year. The applied symmetry analysis enabled sensitive detection of asymmetry across different cranial regions and time points, offering enhanced precision over classical cephalometric methods. This work exemplifies the shift in craniofacial surgery towards digitally guided, objective analysis and planning and supports the development of data-driven standards for outcome evaluation. The integration of geometry-based algorithms into surgical workflows may lay the foundation for future applications in AI-assisted decision-making and training.

No conflict of interest.

ID178

Reduced Th1 Immune Response as a Marker of Preoperative Inflammaging Is Associated with Increased Postoperative Risk

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Elderly patients are predisposed to an elevated risk of postoperative complications. One causative factor is inflammaging, a term denoting an age-related chronic, low-grade inflammation. Inflammaging has been demonstrated to be associated with age-related dysfunction of the T-cell compartment and is exacerbated by the release of DAMPs. Despite its clinical relevance, inflammaging is seldom considered in surgical planning. The present study investigates if preoperative inflammaging, accompanied by T-cell dysregulation, increases the risk of postoperative complications. Blood samples were taken preoperatively from patients over 70 years of age undergoing orthopaedic surgery (hip/knee replacement, spondylodesis). Exclusion criteria included existing infections, immunosuppressive therapies and autoimmune diseases. The combined primary endpoint included postoperative complications according to the criteria of the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP), delirium and mortality. To quantify inflammaging and senescent T-cells, key cytokines were determined by a multiplex assay. The functionality of the immune cells was assessed by in vitro stimulation of whole blood. Of 100 patients, 21% (21/100) reached the primary endpoint, mainly in the form of infections (n=13) and delirium (n=8). In the preoperative blood plasma of the patient group with postoperative complications, IL-1β ($p<0.01$), IL-5 ($p>0.001$), IFN-γ ($p<0.05$), and IL-22 ($p<0.05$) were significantly elevated compared to the control group. The in-vitro whole blood stimulation with CD3/28 (T-cell stimulation) showed a significantly reduced concentration of IL-6 ($p<0.05$) as a cytokine of T-cell activity in patients with postoperative complications already before surgery. Similarly, these patients showed a tendency towards lower cytokine levels of IL-6 ($p=0.07$) during the early postoperative phase. In contrast, the cytokine level of TNF-α was not significantly altered. The innate immune activators LPS (TLR4 agonist) and Aduro (STING agonist) also showed no significant difference for IL-6. Older patients who develop postoperative complications after major surgery already exhibit elevated markers of age-related inflammation in the preoperative period. In particular, dysregulated T-cell activity and increased plasma levels of the Th1-suppressive cytokine IL-22 suggest a preoperative suppression of the Th1 cell population, which may contribute to the increased risk of postoperative complications.

No conflict of interest.

ID179

Live Tracking and Identification of Marker Genes for Predicting Functional Osteogenic Differentiation Potential of Mesenchymal Stromal Cells Using Spherical Nucleic Acid mRNA Nanoflare-based Sensors

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At present, mesenchymal stromal cells (MSCs) are increasingly taking center stage as a therapeutic option for bone diseases and in tissue engineering. The limited biological resources in bone regeneration make MSCs a promising cell population. Fluorescence sensors are developing into an efficient detection method for many intracellular biomolecules. One interesting technology is the NanoFlare (NF) sensor, a type of spherical nucleic acid consisting of gold nanoparticles and densely packed and highly oriented oligonucleotide shells. Immediate specific functional assessment of MSCs is critical for quality control in cell therapy. The aim of the current study is to design, synthesize and apply NF-based sensors to osteogenic differentiating MSCs and the osteoblastic cell line MG63 to track live expression of osteogenic early and late gene markers and to identify marker genes for predicting the osteogenic differentiation potential of MSCs. Methods MSCs and MG63 cell line were differentiated into the osteogenic lineage. The expression of the osteogenic gene markers in both cell types were monitored through their incubation with respectively developed NF-based sensors. The intensity of the fluorescence signal should specifically reflect the intracellular mRNA expression. The expression level of the target mRNA was analyzed by quantifying the fluorescence value using confocal microscopy, image-enabled spectral sorting and RT-PCR. Results Both cell types showed solid mineralization when induced towards the osteogenic lineage compared to the respective controls. The mRNA expression in both cells induced into the osteogenic lineage showed a several-fold increase after quantification of fluorescence signals by imaging of NF-based sensors compared to the respective control. Both cell types showed a significant increase of the typical osteogenic markers ALPL and OPN when analyzed with the S8 Cell Sorter. The mRNA expression of the investigated genes showed similar trends by RT-PCR quantification. Interestingly, the NF-determined expression levels of both markers allowed to predict the functional osteogenic differentiation potential of both cell types. The success of regenerative medicine using MSCs strongly depends on their differentiation potential. The current results suggest that tracking the mRNA levels of defined markers and the sorting of cells with distinct expression patterns can help to predict the functional osteogenic differentiation potential thereby providing useful information for selecting competent MSCs for regenerative medicine.

No conflict of interest.

ID180

Green nudges in the form of structural workplace adjustments reduce the ecological footprint of general anaesthesia by decreasing the consumption of desflurane in the long term

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The medical sector is responsible for a significant share of greenhouse gas emissions. Therefore, a green transformation of the healthcare sector is imperative. Despite the high global warming potential of desflurane, it persists in being used on a regular basis. To combat this climate-damaging behaviour, the implementation of nudges represents a promising intervention. Nudges, in the form of structural workplace adjustments, were implemented with the primary objective of reducing desflurane consumption. The structural changes consisted of replacing the desflurane vaporisers with those for sevoflurane and isoflurane. An analysis of the desflurane's order volume was conducted to evaluate the effectiveness of the nudges. In addition, the emissions of greenhouse gases were normalised to the number of surgical procedures performed. Finally, the economic benefit of reduced desflurane consumption was investigated based on the purchase price. Following the implementation, desflurane was no longer utilised in the long term, corresponding to emission savings of 177.43t CO_2e per quarter. Overall, the nudges resulted in a 91% decrease in emissions caused by volatile anaesthetics, equivalent to 219 t CO_2e for Q4 2023. Consequently, the greenhouse gas emissions per surgical procedure were reduced by 42.2kg CO_2e. Furthermore, the costs of volatile anaesthetics decreased by 63.9%, amounting to a reduction of €18,237.28. Nudges represent an effective approach reducing the carbon footprint of general anaesthesia by eliminating the consumption of desflurane. In the context of climate change, nudges integrating sustainability strategies are poised to assume greater significance as a cost-effective and readily implementable sustainability measure.

No conflict of interest.

ID181

Systematic requirement analyses for smartphone apps in pediatric surgery

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Mobile health (mHealth) applications are increasingly employed in clinical practice and their use in pediatric surgery could potentially benefit both patients and their families. This systematic review aims to summarize the current literature and available smartphone applications for children in a surgical setting. A systematic literature review was conducted to identify existing evidence about smartphone applications in pediatric surgery. We included studies with patients ≤ 18 years of age with surgical conditions. We developed a systematic search strategy with support from the university medical library. The literature search was performed across multiple databases, including PubMed, Embase, the Cochrane Library, Web of Science, and Google Scholar. Two reviewers independently performe the literature screen and data extraction using Covidence. Further, we conducted a search of app stores (Apple App Store and Google Play Store) using the following predefined keywords: “pediatric surgery”, “surgery children”, “surgical care children”, “follow-up”, “wound”, “burn”, “child surgery”, “congenital anomalies”, “birth defects“, “bladder exstrophy“, “cleft lip“, “neuroblastoma“. Apps were being included if they meet the following inclusion criteria: 1) available in German or English language, 2) available for Apple or Android, 3) the app is directed to children or families of the children, 4) surgical condition, 5) use of the app does not require any other tool than a smartphone or tablet, 6) the app is not designed for a study or conference. Results: The systematic literature search initially yielded 4,079 articles. We are currently conducting a title and abstract screen and aim to complete the systematic literature search by the time of the conference. The complementary app search identified nine relevant smartphone applications addressing a range of pediatric surgical conditions, including tracheostomy, spinal fusion, cleft lip and palate, liver disease, congenital anomalies, bladder exstrophy, and spina bifida. The majority of these applications provide medical information for families. This project aims to provide a systematic overview of mHealth applications in pediatric surgery based on current literature and app store search. We aim to identify potential gaps in the application of smartphone tools for a pediatric surgical population.

No conflict of interest.

ID182

Veni, vidi, operavi – Kursvideo als Booster für Selbstsicherheit im OP?

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Im Sommersemester 2025 wurde der curriculare OP-Einführungskurs für Studierende des 5. und 6. Semesters zum zweiten Mal im OP-Trakt des Ulmer Trainingshospitals durchgeführt. Dort trainieren die Teilnehmenden unter Anleitung geschulter Tutor*innen gezielt das Einschleusen, die chirurgische Händedesinfektion sowie sterile und unsterile Verhaltensweisen im OP. Ergänzt wurde das Kursformat durch ein eigens produziertes Lehrvideo zur digitalen Vorbereitung. Ziel war es, die Wirkung dieses Videos auf die Selbsteinschätzung hinsichtlich OP-Kompetenzen zu untersuchen. Es wurde überprüft, ob: (1) Studierende mit Videoeinsatz ihre Kompetenzen signifikant höher einschätzen als Vergleichsgruppen ohne Video, (2) die Kombination aus Video und Kurs zu besseren Werten führt als das Video allein, (3) Studierende ohne OP-Vorerfahrung besonders vom Video profitieren. Zudem erfolgte eine Evaluation zur Akzeptanz des Formats. Die Teilnehmenden füllten zwei Online-Fragebögen zur Selbsteinschätzung von 23 OP-relevanten Teilkompetenzen aus: einmal nach dem Video, einmal nach Kursabschluss (Likert-Skala 1 = sehr unsicher bis 5 = sehr sicher). Zur Auswertung kam der Mann-Whitney-U-Tests zum Einsatz. Subgruppen wurden anhand der OP-Erfahrung gebildet (wenig = max. 5 OP‘s besucht). Studierende mit Videovorbereitung zeigten in 19 von 23 Teilkompetenzen signifikant höhere Werte als jene ohne Video; eine Teilkompetenz wies eine mittlere Effektstärke auf (r>0,3). Die Kombination aus Video und Kurs ergab in 16 von 24 Kompetenzen signifikante Unterschiede gegenüber dem Video allein, drei mit mittlerer Effektstärke. Studierende mit geringer OP-Erfahrung profitierten kaum stärker vom Video als jene mit Vorerfahrung. Das Video erhielt die Note 1,6. Nach der Videovorbereitung glaubten 51,8 % der Studierenden, die Fertigkeiten zu beherrschen; nach dem Kurs fühlten sich 88,2 % sicherer als nur mit der Videovorbereitung. Das Lehrvideo zeigte einen überwiegend positiven Effekt auf die Selbsteinschätzung OP-bezogener Kompetenzen, unabhängig von der Vorerfahrung. Die Kombination mit dem praktischen Kurs erwies sich als besonders effektiv. Diese Ergebnisse stehen im Einklang mit Studien, die Videoeinsatz als lernfördernd und selbstvertrauenssteigernd belegen. Ob daraus ein nachhaltiges Interesse an der Chirurgie erwächst, wird in zukünftigen Beobachtungen diskutiert.

No conflict of interest.

ID183

Proteasomal activation and degradation of junctional proteins contribute to impaired barrier function in intestinal inflammation

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Loss of intestinal epithelial barrier function is a hallmark in the pathogenesis of inflammatory bowel diseases (IBD). Reduced levels of junctional proteins have been reported for tight junctions, adherens junctions and desmosomes in inflammation by largely undefined mechanisms. Here we hypothesize that proteasomal activation followed by degradation of junctional proteins is a key event in inflammation-induced changes in intestinal epithelial cells. Bulk RNA sequencing from patients with IBD revealed no changes of RNA levels of junctional proteins whereas immunoproteasome subunits were strongly elevated in tissue specimens from IBD patients with and without obvious inflammation. Accordingly, proteasome activity was increased in intestinal organoids generated from IBD patients under basal conditions which was paralleled by an overall reduction of junctional proteins. In organoids from healthy donors, application of inflammatory stimuli resulted in loss of junctional proteins, increased expression of immunoproteasome subunits and proteasome activity while changes of junctional RNA levels were absent. In line with this, proximity ligation assay revealed increased interaction of ubiquitin and desmosomal proteins when organoids were subjected to cytokines. Inhibition of cytokine-induced proteasomal activation using the pharmacological inhibitor bortezomib resulted in a partial restoration of junctional protein levels in Western blot analyses. However, bortezomib neither restored reduced cell viability of intestinal epithelial cells nor loss of intercellular adhesion following cytokine application. Accordingly, inflammation-induced loss of barrier function was not prevented by proteasome inhibition. This was explained by the observation that junctional proteins appeared overall increased in immunostaining of epithelial cells but were not fully re-located to the cell borders after proteasome inhibition. In summary this points to a new mechanism by which junctional proteins in particular desmosomes undergo proteasomal degradation in intestinal inflammation.

No conflict of interest.

ID184

Differences between three-dimensional (3D) and two-dimensional (2D) vision on basic laparoscopic motion and force application

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The problem in performing laparoscopic surgery is the lack of depth perception and spatial orientation. Studies have shown the impact of three-dimensional systems (3D) over two-dimensional (2D) systems in regard of learning curve and time in laparoscopic surgery. However, the impact of 3D environment on objective motion parameters and force exertion remains unclear. The purpose of this study is to investigate the impact of 3D vision on instrument motion and force exertion of novice trainees and surgeons performing laparoscopic tasks. This randomized controlled trial included medical students with no prior experience in laparoscopic surgery and surgeons. All medical students completed a proficiency based laparoscopic training course beforehand. Both groups performed three laparoscopic tasks (peg transfer, cutting a circle, laparoscopic suture and knot), once with 2D vision and once with 3D vision in a random order. Primary endpoints were the instrument motion and the applied forces during the tasks. Secondary endpoint was the task completion time. The presented data is preliminary. A total of 27 participants were included in the trial. Performing the peg transfer the novices were significantly faster (2D: 140,7 s vs. 3D: 116,9 s; p<0,001) and used shorter path length of the left instrument (2D: 4016,19 mm vs 3D: 3278,81 mm; p<0,001) and also of the right instrument (2D: 2326,48 mm vs 3D: 1932,89 mm; p<0,01) in 3D. Similar results were also obtained in precise cutting task when using 3D vision. The participants were significantly faster (2D: 212,52 s vs 3D: 180,89 s; p<0,05) and the path length with the right (4209,70 mm vs 3527,59 mm; p<0,05) and left (2D: 3695,96 mm vs 3D: 2867,78 mm; p<0,05) instrument was also reduced. While suturing with 3D vision the novices showed significant reduced mean non-zero force (2D: 0,8959 N vs. 3D: 0,7667 N; p<0,01) and maximal force (2D: 3,8333 N vs. 3D: 3,0778 N; p<0,01) as well as shorter time to accomplish the task (2D: 310,15 s vs 3D: 206,30 s; p<0,01). The path length was shorter especially with the right instrument (2D: 6766,4 mm vs 3D: 4157,4 mm; p<0,001) compared to the left instrument (2D: 6070,2 mm vs 3D: 4306,0 mm; p<0,01) in 3D vision. Our results show that 3D vision can reduce force exceedance in complex surgical tasks. This could lead to improved safety for patients in surgical performance. The participants also needed less time and shorter path length of instruments to complete the exercises. Thus, 3D vision might help novices for complex laparoscopic tasks in terms of motion efficiency and tissue handling.

No conflict of interest.

ID185

Anwendbarkeit einer Mixed-Reality gestützten Herstellung von Physician-modified-Prothesen: Eine Phantom-Modellstudie.

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Physician-modified Prothesen (PMEG) stellen eine wichtige Behandlungsoption für thorakoabdominelle und juxtarenale Aortenpathologien dar, insbesondere in Notfallsituationen. Ziel dieser Studie war es die Anwendbarkeit eines neuartigen, Mixed-Reality (MxR)- gestützten Arbeitsablaufs zur Übertragung vordefinierter Fenestrierungspositionen auf den Stentgraft im Rahmen von PMEG zu evaluieren und diesen mit einem konventionellen Verfahren zu vergleichen.32 Proband:innen führten den Workflow an 3D-gedruckten Phantom-Stentgrafts durch. Dabei wurden vier Fenestrierungspostionen vorgegeben, definiert durch Uhrzeitposition, Abstand zum proximalen Stentgraft-Rand sowie der Höhe und Breite der Öffnungen: Truncus coeliacus (F1), Arteria mesanterica superior (F2), Rechte Nierenarterie (F3) und linke Nierenarterie (F4). Die Genauigkeit wurde bewertet, indem der Abstand zwischen den vorgegebenen und den tatsächlich markierten Positionen in mm gemessen wurde. Zudem wurde die Zeitdauer des Workflows erfasst. 12 weitere Proband:innen verglichen den MxR-Worflow mit einer konventionellen Methode. Die Endpunkte waren: Abstände zwischen Soll- und Ist-Positionen, Anzahl notwendiger Wiederholungen, sowie die nötige Zeit, bis eine Position mit möglichst geringer Überlappung mit den Stentstreben gefunden wurde. Die Benutzerfreundlichkeit wurde mittels System-Usability-Score (SUS) beurteilt. Insgesamt markierten 32 Teilnehmende 128 Fenestrierungen. Die mittleren Abstände (in mm mit Standardabweichung, SD) von den vordefinierten Positionen waren 1,3 (SD 0,6) für F1, 1,0 (SD 0,5) für F2, 1,0 (SD 0,6) für F3 und 1,5 (SD 0,9) für F4. Die durchschnittliche Zeitdauer des Workflows betrug 5:31 Minuten (SD 1:19). Die Bewertung der Benutzerfreundlichkeit mittels SUS ergab einen hohen Wert von 84,2 (SD 11,5). Im Rahmen der Vergleichsanalyse wurden 48 Fenestrierungen von 12 Beobachtern markiert. Der mittlere Abstand von den vordefinierten zu den markierten Positionen für F1 bis F4 betrug 0,9 (SD 1,2), 0,3 (SD 0,3), 1,2 (SD 0,8) und 0,9 (SD 0,7) für die konventionelle Methode und 1,4 (SD 0,7), 0,6 (SD 0,5), 0,8 (SD 0,7), 1,2 (SD 0,6) für MxR (p=n.s.). Wiederholte Versuche waren bei 10 von 12 Beobachtern in der konventionellen Gruppe erforderlich, im Vergleich zu nur 3 von 12 in der MxR-Gruppe (p<0,05). In der Zeitdauer zeigte sich ein signifikanter Unterschied: Die konventionelle Methode benötigte im Mittel 14,6 Minuten (SD 7,7) im Vergleich zu 6,7 Minuten (SD 3,7) für MxR (p<0,05). Die SUS-Werte lagen im Mittel bei 43,2 (SD 20,0) für die konventionelle Methode, während sie signifikant höher lagen bei 85,1 (SD 10,3) für den MxR-Workflow (p<0,05). Der MxR-gestützte Arbeitsablauf für PMEG zeigt vielversprechendes Potential zur klinischen Anwendung.

No conflict of interest.

ID186

Untersuchung der Muskelaktivierung nach Frakturen der Clavicula

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Die skapulothorakale Dyskinesie ist eine unspezifische Reaktion auf einen schmerzhaften Zustand in oder um die Schulter. Da die Clavicula ein wichtiges Element im Schultergürtel ist, können Frakturfolgen auch die Entwicklung einer Skapuladyskinese auslösen, entweder als Folge des Verlustes eines stabilen Drehpunktes für die Schulter an der Brustwand oder aufgrund von unwillkürlichen Änderungen der Muskelaktivierungsmuster, um durch verletzte Strukturen verursachte Schmerzen zu reduzieren. Das Ziel dieser prospektiven Studie ist es zu beschreiben, wie Frakturen der Clavicula und ihre Behandlung die Muskelaktivierungsmuster beeinflussen um zu überprüfen, ob Asymmetrien zwischen Aktivitätsverhältnisse von M. trapezius descendens zu M. trapezius ascendens, M. trapezius transversus und M. serratus anterior existieren. Im Rahmen einer kontrollierten Kohortenstudie wurden Patienten mit Frakturen der Clavicula und gesunde Probanden untersucht mittels Oberflächen- Elektromyographie (DIERS-iEMG pro®, 2000 Hz): 10 volle standardisierte Abduktion- und Flexionszyklen wurden für 4 Zielmuskeln (M. trapezius, Pars descendens, transversa, und ascendens und M. serratus anterior) registriert und in 6 definierte 1-Sekunde Abschnitte analysiert. Aktuelle Analysen von zwölf Patienten mit Klavikulafrakturen deuten darauf hin, dass die elektrische Aktivität des Musculus serratus anterior während der Flexion sowie die elektrische Aktivität des Musculus serratus anterior und des Musculus trapezius descendens während der Abduktion auf der verletzten Seite in 50 % der Fälle reduziert sind. Dies konnte anhand der folgenden Parameter, die die Muskelaktivierung beschreiben, festgestellt werden: Spitzenamplitude (Peak Amplitude), Effektivwert-Amplitude (RMS Amplitude) und die Fläche unter der Kurve (Area under the curve). Andere untersuchte Parameter zeigten inkonsistente Ergebnisse. Bei über 50% der Patienten mit Claviculafrakturen zeigen sich nach der Verletzung relevante Veränderungen in den Aktivierungsmustern der periskapulären Muskulatur, insbesondere des Musculus serratus anterior und des Musculus trapezius descendens. Die Anwendung von Oberflächen-EMG kann dabei helfen, diese Veränderungen zu erkennen, zu quantifizieren und somit wichtige Hinweise für die postoperative Nachbehandlung zu liefern.

No conflict of interest.

ID187

Evaluation of ergonomics and surgeon's stress levels during robotic assisted minimally invasive surgery using a new hybrid robot (Dexter)

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While many ergonomic challenges faced in open and laparoscopic surgery have been overcome by robotic surgery, new challenges have been created. Nationwide and international guidelines for implementation of an ergonomic workspace are currently lacking. This study aims to identify ergonomic characteristics of a new hybrid robotic system during a standardized procedure to lay the foundation for a healthy workspace. Measurements were performed during a real-life case of a robotic cholecystectomy performed by an experienced robotic surgeon. A video camera was used to capture the surgeon at the console during surgery. For evaluation of the images, axes are placed through the joints of the surgeon and corresponding angles are calculated. To evaluate the objective stress level of the surgeon the heart rate variability (HRV) was measured using a chest strap and analyzed using specific scientific software. Furthermore, sound level measurement was performed to evaluate the noise level in the OR. Data was further correlated with the intraoperative course and surgical performance. N=2 robotic cholecystectomies performed by the same experienced surgeon were measured. Mean sound level was 63.5dB for the first case(range 57.5dB–77.3dB) and a mean of 61.2dB for the second case (range 55.3dB–82dB). Correlation of console versus non console time was analyzed. Mean posture during both procedures in correlation to recommendations for a safe workplace are shown in table1. Mean heartrate, HRV and stress indices are shown in table2. Furthermore, figure3 shows the correlation of heart rate and the intraoperative course. A variety of different robotic systems do not only offer a variety of technical features and advantages but also differ in ergonomic requirements. The neck can be identified as an area of need for improvement for most systems. Future studies, especially in a randomized controlled fashion need to be performed to further analyze ergonomic features of the different systems and guidelines displaying the variety of systems need to be implemented to create a healthy and safe workplace.

Conflict of interest:

Dr. Krauss received a grant within an investigator-initiated study from Distalmotion unrelated to this study.

ID189

Personalized Evaluation and Training of Surgical Ergonomics for Trainees During Robotic Assisted Minimally Invasive Surgery

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There is a need for surgical ergonomics training, especially for trainees in robotic surgery, as a healthy workspace has gained more importance than ever.Aim of the study is to analyze the trainee's posture and thus identify the ergonomic requirements in the robotic operating room from a trainee standpoint.Data is further used to apply an ergonomic training to reduce the workload of surgeons using a robotic device and consecutive evaluation of the training is performed. Evaluation of the trainee and their interaction with the new technology was performed during the Robotic Technology Discovery Courses organized by the EAES at IRCAD, Strasbourg. Data was analyzed on site to give participants individual feedback about their performance and tailored suggestions for improvement.Every participant completed a questionnaire before and after the evaluation.A video camera was used to capture the surgeon at the console during surgery.Corresponding angles are calculated based on the position of the individual axes in relation to each other and compared to recommendations for a healthy workspace. A total of 36 participants were measured within two courses in April and July of 2024. Evaluation of the questionnaires revealed that only 15% of participants (n = 5) had previous experience in the field of ergonomics, 82% (n = 27) expected to learn how to ergonomically use the console during this course. 61%(n = 20)stated to have physical discomfort in a body region where before the exercise no pain was felt, mainly(51%)in the upper body and back.97%of participants felt that this course helped improve ergonomic skills,100%stated that they can apply this content to their everyday life. A mean of159.6 pictures per participant were evaluated in the first course, a mean of226.8in the second course.Results of body angles compared to current recommendations for a safe workplace are depicted in table1. Evaluation of surgical ergonomics helped identify the ergonomic requirements in a training setting.Real time individual feedback helped improve almost every participant ergonomic skills.Identifying a trainee's individual opportunities for improvement creates the foundation for personalized training and education in surgical ergonomics leading to an improved and healthier workspace for young surgeons and their future careers.

Conflict of interest:

The study was financed by an independent study grant from the EAES.

ID190

Developmental Maturation of Intestinal Junctional Complexes in Extremely Preterm Infants

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The intestinal epithelial barrier (IEB) is vital for nutrient absorption and protection against pathogens, a function especially crucial and vulnerable in preterm infants due to their immature barrier structures. This study aimed to characterize the composition and developmental progression of intestinal junctional complexes—tight junctions, adherens junctions, and desmosomes—in extremely preterm infants with corrected gestational ages between 25 and 28 weeks. Using immunofluorescence staining, resection specimens from six preterm infants were analyzed and compared to samples from four adult individuals. Tight junction proteins Claudin-3 and Occludin, adherens junction protein E-cadherin, and desmosomal proteins Plakoglobin and Plakophilin-2 showed adult-like expression even in the earliest preterm samples, indicating early developmental expression. Desmosomal proteins Desmoglein-2 and Desmoplakin presented incomplete and fragmented expression in all preterm infant samples. In contrast, tight proteins Claudin-1, -4, -5 and ZO-1 exhibited gradual maturation in the observed time period. Notably, Desmocollin-2 showed early expression followed by an unexpected decline over time, suggesting dynamic regulation possibly linked to epithelial remodeling. These findings provide the first comprehensive description of junctional protein development in the human preterm intestine and suggest that the compromised barrier function observed in these infants may be due to selective immaturity of junctional protein composition. Understanding these developmental trajectories offers a foundation for future research targeting postnatal intestinal barrier maturation and related gastrointestinal pathologies, such as necrotizing enterocolitis.

No conflict of interest.

ID192

Insight into Appendicular Lumina - a Prospective Study of the Prevalence of Appendicoliths by Intraoperative Extracorporeal Incision in Acute Appendicitis

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In cases of uncomplicated acute appendicitis (UAA), the absence of faecoliths in appendicular lumen is often a deciding factor for non-operative treatment (NOT), despite the considerable failure rates linked to this approach. The prevalence of faecoliths has previously been reported to range between 15 % and 38 %, based on retrospective analyses using CT scans, ultrasound, intraoperative palpation, and pathology reports. These methods may, however, miss a number of concrements. This study hypothesizes that the true prevalence of faecoliths is underestimated, potentially contributing to the high treatment failure rate in NOT for appendicitis. In a prospective cohort of 56 adult patients diagnosed with acute appendicitis, we introduced intraoperative extracorporeal incision of the vermiform appendix, complementing standard diagnostic tools, to assess the actual presence of appendicular faecoliths. Our findings demonstrated a 50% increase in the detection of faecoliths through intraoperative examination (n = 36) compared to preoperative imaging (n = 24). Overall, faecoliths were identified in 70 % of patients with acute appendicitis (n = 40). These results indicate that conventional diagnostic techniques may significantly underestimate the presence of faecoliths, which could explain the elevated rates of treatment failure in non-operative approaches to uncomplicated acute appendicitis.

No conflict of interest.

ID193

Using Blount's sling does not seem to be associated to secondary dislocations following closed reduction of a supracondylar fracture

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Blount's sling is a highly debated method in the treatment of paediatric supracondylar fractures for both conservative management and postoperatively after closed reduction of the fracture. Many advocate against its use, because of the perceived increased risk of secondary dislocations requiring an intervention or even a re-intervention with internal fixation. We therefore aimed to assess the frequencies of a secondary dislocation following immobilisation after closed reduction in theatre for a paediatric supracondylar fracture. We retrospectively included all patients who had a Blount sling for immobilisation after closed reduction of a paediatric supracondylar fracture in two representative months April and May 2021. Among the assessed variables were age, sex, angle of displacement in the lateral view of the x-rays pre- and postoperatively, classification according to von Laer, duration of follow-up, the necessity of a re-operation or a change in management. Patients were followed until full consolidation of the fracture had occurred. Patient age was compared between sexes via an unpaired t-test and pre- and postoperative displacement in the lateral view via a paired Welch-test. The classification of the fracture was reviewed by a board-certified paediatric radiologist for accuracy. We included 18 patients in the investigated time, among which were 11 girls and 7 boys. The mean age of the whole cohort was 5.2 years (standard deviation 2.5), in boys it was 5.9 years (standard deviation 2.7), while it was 4.8 years (standard deviation 2.5) in girls, and did not differ between them (t=-0.87, P=0.4). Fractures were classified according to van Laer as type II in eight cases, as type III in another eight cases, as type IV in one case, and in the remainder the classification could not be applied due to a non-standard view in the lateral x-ray. The pre-interventional angle of displacement was 23.6 degrees (standard deviation 7.9) and 2.9 degrees (standard deviation 3.2), which was, as expected, substantially different (t=10.3, P<0.001). During follow-up, no complications occurred, especially no secondary dislocation or (re-)intervention. We did not encounter a secondary dislocation of patients immobilised with Blount's sling following closed reduction of a supracondylar fracture. However, this needs to be corroborated including more cases and those with an initial conservative management plan.

No conflict of interest.

ID194

Paediatric pilonidal sinus treatment in Germany – a nationwide survey of paediatric surgeon

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Pilonidal sinus disease is a chronic inflammatory condition increasingly recognized as a distinct clinical entity in pediatric patients due to its age-specific characteristics and higher recurrence rates compared to adults. While studies have embraced minimally-invasive approaches, the treatment reality remains elusive. We therefore aimed to address this knowledge gap by surveying German paediatric surgeons on their approach to children and adolescents with pilonidal sinus disease. We conducted a nationwide survey among pediatric surgical institutions in Germany. A total of 101 institutions were contacted (90 pediatric hospitals and 11 office-based surgical practices with access to inpatient beds), of which 40 responded. The 14-question survey focused on surgical volume, recurrence rates, surgical techniques, experience level of operating surgeons, use of intraoperative dyes, postoperative care, and decision-making in three standardized case scenarios. Our recall rate was 40% (40/101), of which 39 operated on pilonidal sinus disease patients, with most reporting between 11 and 20 procedures per year. Recurrence cases were stated as less than 20% of surgeries in the majority of institutions. The most commonly used surgical techniques were excision with secondary wound healing (17/39), followed by excision and vacuum-assisted closure (13/339), pit picking (12/39), and primary closure (14/39). When asked about treatment changes in recurrent cases, the group was nearly evenly split: 20 reported changing their approach, mainly favoring wide excision, while the remainder sticked to their primary approach. The participants were also faced with three clinical case scenarios, which revealed heterogeneous management strategies. Paediatric pilonidal sinus disease in Germany is predominantly treated using traditional excisional methods. Minimally-invasive techniques are seldom used. The survey highlights inconsistencies in clinical practice. These findings highlight the need for outcome-driven studies and the development of paediatric-specific treatment protocols.

No conflict of interest.

ID195

Non-reproducibility in the murine model of postoperative ileus: On in- and outbred strains, variability and intestinal lengths

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The model of postoperative ileus heavily relies on the murine model for basic research, while rats and pigs were favoured in more translational approaches. In it, mice are standardised based on body weight or age and many groups favour the C57Bl/6 strains to BALB/c. To measure intestinal transport time, the gut is separated into the stomach, ten equal-sized small intestinal segments, the caecum, and three large intestinal segments. This assumes that intestinal transit time is proportional to absolute intestinal length or that absolute length is similar in the mice due to the standardisation. We aimed to test this by comparing the intestinal lengths of the Crl:CD1(ICR) outbred strain to inbred C57Bl/6J and C57Bl/6NCrl strains. We measured intestinal lengths of the caecum, small and large intestine in those strains and tested whether these could be determined from the allometric parameters body weight, crown-rump length, and age via multivariable regression. A sample size analysis based on published data calculated 104 mice to be included to detect a difference from zero. In addition, we compared the coefficients of variation of the intestinal lengths in the substrains via the modified signed-likelihood ratio (MSLR) test for equality. Results: We included 125 mice of Crl:CD1(ICR) background and 10 mice each of C57Bl/6J and C57Bl/6NCrl background. Mean small intestinal lengths were 437 (standard deviation (SD) 54) millimetres (mm), 473 (SD 29) mm, and 419 (SD 57) mm respectively. The coefficients of variation were equal for small intestinal lengths (MSLR 5.878, P=0.053). Mean caecal lengths were 35.3 (SD 6.1) mm, 32 (SD 2) mm, and 31.4 (SD 3.1) mm, respectively. Mean large intestinal lengths were 102 (SD 20) mm, 88.7 (SD 9.4) mm, and 76.9 (SD 6.1) mm, respectively. Their coefficients of variation were substantially different (Caecum: MSLR 14.07, P<0.001; Large intestine: MSLR 12.98, P=0.002). Intestinal lengths could not be predicted by allometric parameters, because of the substantial multicollinearity (variance inflation factors >100). There was substantial variation in small intestinal lengths of C57Bl/6 inbred strains, which were equal to those of Crl:CD1(ICR) outbred mice. This indicates that intestinal transit time could be substantially different among experimental groups perceived to be homogenous and may thus contribute to non-reproducibility. We could not show that standardisation by age or body weight might work.

No conflict of interest.

ID196

The resistance to traction forces differs substantially between intestinal parts of different mice strains

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Traction forces applied to an anastomosis under tension are a relevant predictor of anastomotic complications along the gut, associated to a negative outcome. Although surgical strategies to avoid anastomotic tension in intestinal anastomoses exist, the odds of an anastomotic insufficiency increased by factor 10. Although colonic, oesophago-gastric, and oesophago-oesophageal anastomoses had been tested in rats, none of them were compared to the intact organ and if it was done for the oesophago-oesophageal anastomosis, it revealed that simple interrupted-suture anastomoses sustained traction forces of only 38% of the intact organ. We therefore aimed to assess the durability of the intact murine gastrointestinal tract in both in- and outbred strains. We included the gut from stomach to rectum in a standardised manner from 50 Crl:CD1(ICR), 10 mice of C57Bl/6J, and 10 mice of C57Bl/6NCrl background. Based on the results of the testing of intestinal durability in mongrel dogs, we calculated a bias-corrected sample size for α=0.05 and β=0.9 of four samples per group. In order to account for uncertainties due to a different species, we aimed for a sample size of at least ten times the calculated minimum sample size. We constructed a non-linear generalised least squares model of traction forces being predicted by strain, organ, their potential interaction and a random variation term by strain. We compared traction forces via estimated marginal means. The model was statistically significant in a type III-analysis of variance for organs (X^2=518, df=6, P<0.001) and strain (X^2=19.3, df=2, P<0.001), but not their interaction (X^2=18.9, df=12, P=0.09). In all strains, the stomach had the highest resistance to traction forces ($\bar{x}\geq$1.87 N, $\sigma\leq$0.63) compared to other intestinal parts (estimate ≥0.56, t-ratio ≥4.4, P<0.001), whereas ileum had the lowest resistance to traction forces ($\bar{x}\geq$0.43 N, $\sigma\leq$0.13). In all mice, the resistance to traction forces was in a descending manner: Stomach>rectum($\bar{x}$>1.31 N, $\sigma\leq$0.63)>caecum($\bar{x}$>1.1 N, $\sigma\leq$0.37)>colon($\bar{x}$>0.93 N, $\sigma\leq$0.31)>duodenum($\bar{x}$>0.65 N, $\sigma\leq$0.28)>jejunum($\bar{x}$>0.5 N, $\sigma\leq$0.16)>ileum. The lowest means were observed in Crl:CD1(ICR) mice. There were substantial differences with regard to traction forces between the different parts of the gut in mice, which are dissimilarly distributed to dogs and pigs indicating that results in surgical models involving anastomoses may not reproduce in another species.

No conflict of interest.

ID197

Defining Entrustable Professional Activities for German medical students during their final year clinical clerkship in pediatric surgery

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The final-year clinical clerkship in Germany (German: Praktisches Jahr; short: PJ) marks the transition from medical school to residency requiring growing expectations on clinical responsibility. Entrustable Professional Activities (EPAs) offer a structured, competency-based approach to define and assess core clinical tasks. This study aims to identify relevant EPAs in pediatric surgery to support standardized and practice-oriented training for medical students nationwide. As a first step toward restructuring PJ training in pediatric surgery based on EPAs, we aim to assess the current requirements for medical students across Germany. We will conduct a nationwide survey of pediatric surgery departments using a five-item questionnaire addressing: (1) whether pediatric surgery is offered as an independent rotation or integrated within surgical/pediatric rotations, (2) the number of PJ students per rotation, (3) the presence of physician assistants in the team and (4) the availability of affiliated teaching hospitals offering pediatric surgery during PJ. Next, we will analyze existing student logbooks in two phases: (1) evaluation of variables such as location, learning objectives, documentation practices and content and (2) subsequent mapping of the mentioned competencies to EPA domains, including patient care, medical knowledge, communication, health advocacy, professionalism, system-based practice and lifelong learning. We contacted the department heads and teaching coordinators of 39 medical faculties across Germany. Currently, 13 logbooks are available for analysis. By the time of the conference, we will have analyzed the logbooks. Based on our findings, we aim to redefine the competencies expected at the level of a first-year resident, rather than those of a medical student. The revised logbook is intended to support PJ students in pediatric surgery by providing a structured framework for acquiring relevant competencies and facilitating a smoother transition into residency.

No conflict of interest.

ID198

Fasciotens pediatric® for simple and complex gastroschisis – a monocentric cohort compared to a meta-analytic benchmark indicates a potential benefit in time to full enteral feeds

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Several approaches exist for the management of gastroschisis, among them the staged repair using the silastic chimney or the spring-loaded silo, and primary closure. However, in cases with large to giant herniations of abdominal contents, even staged repair might become rather difficult. This has fueled the expansion of a weight-guided fascial traction technique, developed for adults with abdominal catastrophe – the open abdomen – in order to achieve fascial approximation to allow closure of the open abdomen, to the management of congenital abdominal wall defects. In a prospective series of 16 infants, the usability of the device had been tested, but its potentially beneficial effects have not been compared to established cohorts. We retrospectively identified all infants treated with the vertical traction device at our centre between January 2022 and June 2025 and included those with gastroschisis. Summary statistics were compared to the results of a meta-analysis comparing simple and complex gastroschisis (J Pediatr Surg 2014;49:1527-1532) in order to have a sufficiently large comparator. Comparison was done via simulating 100,000 times a cohort of our size based on the normally-distributed weighted summary statistics of the meta-analysis separated for simple and complex gastroschisis. Comparison of this simulated cohort to ours was done via Welch's test and a correction for multiple-testing was applied via the Benjamini-Hochberg procedure. We included six infants with gastroschisis, four with a simple form and two with a complex form. Mean duration of parenteral nutrition was 23 days (range 16-29 days) for simple and 100 days (range 58-142 days) for complex forms. Enteral feeds with breastmilk or formula were started after one to four days postoperatively. Full enteral feeds were achieved after a mean of 22 days (range 14-27 days) in simple and after 109 days (range 78-139 days) in complex gastroschisis. While differences in time to full feeds could not be detected in complex gastroschisis, 8.2% of 100,000 simulated comparisons showed a shorter time to full enteral feeds in our cohort. Compared to the benchmark from the meta-analysis, even in our small cohort of severe forms of simple gastroschisis, based on the amount of herniated organs, a potential benefit of linear fascial traction seems to be present, which warrants further investigation in larger cohorts.

No conflict of interest.

ID199

Biochemical Snapshot- a time saving approach to replace frozen sections in parathyroid surgery

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In patients with primary hyperparathyroidism (pHPT) intraoperative parathyroid hormone (IOPTH) measurement is an essential part to confirm a successful removement of a parathyroid adenoma. Additional confirmation by frozen section is time consuming and delays surgical workflow. On the other hand the confirmation of (hyperplastic) parathyroid tissue in the resection specimen increases diagnostic safety and promotes a quick decision to terminate surgery. Here we report first data on a novel approach to confirm the presence of parathyroid tissue in resection specimens within 5-7 min using an intraoperative point-of-care test before measurements of serum PTH is possible. Biochemical snaphot of the resected tissue specimens was obtained by placing them in 20 ml 0.9% NaCl for 2 minutes followed by PTH measurements from the fluid using the instant high sensitivity assay “ioPTH”, a quick chemiluminescent microparticle immunoassay for the quantitative measurement of intact parathyroid hormone (NBCL CONNECT Analyzer). To confirm biochemical snapshots all tissues were analysed in frozen sections. In parallel, serum PTH levels were determined 10 and 20 min after resection of the adenoma. 25 patients with pHPT underwent focused parathyroidectomy after imaging-based preoperative localization diagnostics. Age at surgery was 60 ±11 years. Mean baseline levels of IOPTH before resection were 120 (range 88-159) ng/L. Following resection of parathyroid adenoma biochemical snapshot showed considerably high PTH levels of a median of 4424 [range 208-418977] ng/L in 25 cases in which the presence of parathyroid tissue was confirmed by frozen section. In two cases PTH levels in biochemical snapshots were around baseline serum levels. The tissue specimens were then reported to be thymus or a lymph node, respectively which led to further surgical exploration. Finally, in all cases parathyroid adenoma were successfully identified which was confirmed by consecutive drop of serum PTH levels to 20±11% of baseline after 15-20 min. The correlation between positive biochemical snapshot and successful surgery as revealed by loss of PTH levels was highly significant (p=0.019). Biochemical snaphot enabled a decision to end or continue surgery within 7 min after resection of the suspected parathyroid adenoma. These preliminary results suggest that the use of biochemical snaphot could be a novel approach as a fast and reliable method to safe time without losing quality in parathyroid surgery.

No conflict of interest.

ID200

The effects of bile microbioma, bile stenting and antibiotic therapy on postoperative morbidity in pancreatic head resections. A unicenter, retrospective analysis

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Pancreatic surgery is associated with one of the highest numbers of postoperative complications in abdominal surgery. Previous studies indicate that the individual bile microbiome and the insertion of a bile stent preoperatively might influence post-pancreatectomy moribidity. This unicenter, retrospective analysis incorporates 320 pancreatic head resections performed at the university hospital of Cologne from 2016 until 2024. Our objective was to evaluate associations between bile microbiome, respectively bile stents and postoperative morbidity. All patients gave their written informed consent to offer their data for scientific research. From the evaluated 320 pancreatic head resections, there were information on an intraoperative bile swap in 236 patients; in 123 patients, the bile swap was sterile and in 113 patients, the bile swap was contaminated. 43 out of 236 patients (18%) harbored a bile stent at the time of the operation. In general, patients who were bile-stented preoperatively had a contaminated bile swap significantly more often (88%, N= 38/43). These patients harbored also different types of bacteria more likely. Reversely, a sterile bile swap was nearly always associated with the lack of a bile stent (96%, N= 117/123). In case of a contaminated bile swap, the bile microbioma did not differ significantly comparing stented and non-stented patients; Enterococcus faecalis-species were present in more than 50% either way. Neither a contaminated bile swap nor the presence of a bile stent elevated the post-pancreatectomy morbidity significantly. Enterococcal species were also not associated with postoperative complications. Intraabdominal abscesses and subsequent CT-guided punctions occured significantly more often in case of a sterile bile swap. Concerning antibiotical regimen, a perioperative antibiosis was started more likely in case of a bile stent and a postoperative antibiosis was rather administered when there was no bile stent present ($p<0.001$). More bacterial species in the bile swap were associated with significantly more wound infections ($p=0.03$; OR=1.30, CI95 1.03, 1.67). In pancreatic head resections, patients with bile stents have significantly more often contaminated bile. This subgroup is regularly given perioperative broad-spectrum antibiosis which might account for similar postoperative complication rates comparing patients with and without bile stents, respectively patients with sterile and contaminated bile.

No conflict of interest.

ID202

Intra- and postoperative transfusion of blood products and the effect on postoperative morbidity in pancreatic head resections- A unicenter, retrospective analysis

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Pancreatic surgery counts among one of the most complicative types of abdominal surgery. Adverse postoperative events like pancreatic fistulae, bleeding complications and re-operations as well as the primary surgery itself account for the need of the transfusion of blood products. Former studies already indicate the overall poorer short-term and long-term outcome in case of transfusions. Our aim was to outline differentiated postoperative complications with respect to the administration of blood products during the hospital stay of patients undergoing pancreatic head resections. We included 269 patients with pancreatic head resections, which were performed from 2016 until 2024 at the university hospital of Cologne in our analysis. All patients gave their written informed consent so that their medical data may be used for scientific reasons. Out of all included patients, 11% received intraoperative transfusions and 25% were given more than two packed red blood cell concentrates in the overall hospital stay. In 68% of all patients, there was no transfusion documented in the intra- und postoperative course. 7.4% suffered from pancreatic fistulae grade B or C. Pancreatic fistulae occured significantly more often in case of intraoperative transfusion in the univariable analysis (p=0.007; OR 4,21, CI 95 1.38, 11.6) and correlate significantly with the total number of transfused fresh frozen plasmas (p=0.017) and the total number of transfused thrombocyte concentrates (p=0.010). Other postoperative complications like intraabdominal abscesses and subsequent CT-guided punctions correlate significantly with intraoperative transfusions as well (p=0.004; p=0.016). Re-operations and post-pancreatectomy haemorrhage were significantly more frequent, if patients were administered more than one packed red blood cell concentrate during their hospital stay (p=0.001, respectively). The overall Clavien Dindo score was significantly higher in case of intraoperative transfusions in the univariable analysis (p=0.008; OR 1.89, CI 1.15, 3.02) and multivariable analysis (p=0.045; OR 2.3, CI 1.02, 5.40); the overall hospital stay was on average 7 days longer (15 days vs. 22 days, p=0.007). The transfusion of blood products in the intraoperative course after pancreatic head resections can predict specific postoperative complications like pancreatic fistulae, intraabdominal abscesses and a higher Clavien Dindo score. In case of intraoperative tranfusions, patients remain in the hospital for 7 days longer, on average.

No conflict of interest.

ID204

Pulmonale Aktinomykose: Eine Herausforderung in Diagnostik und Therapie

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Die pulmonale Aktinomykose macht etwa 15 % aller Aktinomykosen aus und wird durch Inhalation oder Aspiration des Bakteriums verursacht. Die klinischen Symptome sind oft unspezifisch und die radiologischen Befunde variabel. Eine langfristige Antibiotikatherapie kann Rezidive verhindern. In einer retrospektiven Studie wurden Patienten mit pulmonaler Aktinomykose untersucht. Ziel war es, die Diagnostik und Therapie sowie die Langzeitergebnisse dieser komplexen Erkrankung zu analysieren. Patienten mit histologischem oder mikrobiologischem Nachweis einer Aktinomykose wurden in diese retrospektive Analyse eingeschlossen. Die initiale Symptomatik sowie der diagnostische Verlauf bis zur definitiven Diagnose der Erkrankung wurden ausgewertet. Darüber hinaus wurden Komorbiditäten und Immunsuppression sowie das therapeutische Vorgehen einschließlich chirurgischer Eingriffe untersucht. Zwischen Januar 2014 und Dezember 2022 wurde bei insgesamt 179 Patienten das Bakterium Actinomyces mikrobiologisch oder histologisch nachgewiesen. 16 Patienten hatten eine isolierte pulmonale Aktinomykose und wurden weiter untersucht. Das mediane Alter betrug 62 Jahre (IQR 59-68,2 Jahre). Frauen und Männer waren gleich häufig betroffen. Die häufigsten klinischen Symptome waren Lungeninfektionen (8/16), Dyspnoe (4/16), Husten (3/16) oder Bluthusten (1/16). Die mediane Zeit vom ersten Krankenhausaufenthalt bis zur Diagnose betrug 150 Tage. Als häufigste Spezies wurde Actinomyces odontolyticus identifiziert. In zwei Fällen wurde fälschlicherweise ein Lungenkarzinom als Erstdiagnose gestellt. Bei einem Patienten wurden zwei Jahre nach der Diagnose einer pulmonalen Aktinomykose maligne Zellen in der gleichen Läsion gefunden. Zur Behandlung der pulmonalen Aktinomykose wurden verschiedene Antibiotika mit unterschiedlicher Behandlungsdauer (Median 12,5 (IQR 3-40) Wochen) eingesetzt. Acht Patienten sprachen gut auf die Therapie an. Bei zwei Patienten konnte ein dentogener Infektionsherd nachgewiesen werden. Die pulmonale Aktinomykose stellt aufgrund ihrer atypischen Symptomatik eine diagnostische Herausforderung dar. Vor Beginn einer langfristigen Antibiotikatherapie ist die Abgrenzung von einer malignen Genese der Läsion entscheidend. Größere Studien sind erforderlich, um einen standardisierten Algorithmus zur Optimierung der Diagnostik und Therapie der pulmonalen Aktinomykose zu ermöglichen.

No conflict of interest.

ID205

Inflammatory Signals as a prognostic factor for Acute Appendicitis Stages According to EAES 2015 Guidelines

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This retrospective study aimed to assess the diagnostic value of C-reactive protein (CRP) and leucocyte count, as defined by the EAES 2015 guidelines for acute appendicitis (AA), in distinguishing between uncomplicated (UAA) and complicated appendicitis (CAA). Intraoperatively, simple inflammation of the appendix without surrounding reaction was classified as UAA, whereas phlegmonous, gangrenous, perforated appendicitis or abscess formation were considered CAA. The study was conducted at University Hospital Magdeburg, Germany, and included 558 adult patients who underwent appendectomy for acute appendicitis between January 2016 and December 2020. Collected data included demographics, preoperative inflammatory markers, and postoperative outcomes. Preoperative CRP levels were significantly higher in patients with CAA (mean: 82.13 mg/L) compared to those with UAA (mean: 16.60 mg/L; $p < 0.001$). Leucocyte counts were also elevated in CAA (14.69 Gpt/L vs. 13.55 Gpt/L; $p = 0.002$). CRP demonstrated moderate diagnostic value for identifying CAA (AUC = 0.78), with a cutoff value of 41.2 mg/L significantly associated with increased probability of complicated appendicitis (OR: 7.47; $p < 0.001$). In contrast, the leucocyte count showed limited predictive ability (AUC = 0.57). Furthermore, a CRP level ≥ 41.2 mg/L correlated with a higher risk of postoperative complications (OR: 4.26; $p < 0.001$) and prolonged hospitalization (median: 3.5 vs. 5 days; OR: 3.31; $p < 0.001$). Within the framework of the EAES classification, CRP serves as a valuable diagnostic marker for differentiating between complicated and uncomplicated appendicitis and is associated with a greater risk of postoperative complications and longer hospital stay. Leucocyte count, by contrast, has limited diagnostic utility for identifying CAA.

No conflict of interest.

ID206

Are there gender differences in the outcome of primary resection of solitary fibrous tumors of the pleura?

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Solitary fibrous tumors of the pleura (SFTPs) are primary pleural tumors of mesenchymal origin. Surgery is the treatment of choice for SFTPs. Little is known about gender differences in the surgical outcome of SFTPs. In a 22-year retrospective single-center analysis between January 2003 and December 2024, a total of 133 patients underwent primary resection of SFTP. Patients' demographics and clinical data were retrieved from the institutional database. Demographics, comorbidities, operative details, immunohistochemistry, postoperative course, recurrence rate and outcome were compared between women and men. The mean age for the entire study group was 64 ± 11.5 years and the mean tumor size was 8.0 ± 7.3 cm. Overall survival (OS) was 189.2 month and recurrence-free survival (RFS) was 175.4 month. 56.4% of patients were female and 43.6% were male. There was no difference in mean age (63.5 ± 11.4 vs. 63.0 ± 11.5) or mean tumor size (8.0 ± 7.3 vs. 8.0 ± 7.2) in women compared to men. There was a significant difference in OS in women compared to men (p=0.009), but no significant gender difference in RFS (p=0.082). In the female cohort, there was a significant difference in RFS in relation to tumor size (<10cm vs. >10cm; p=0.001) in contrast to the male cohort (p=0.958). Regarding the age cutoff of 55 years, OS did not differ between women and men (p=0.074). There is a gender difference in relation to overall survival between women and men after primary resection of SFTPs, in contrast to recurrence-free survival. Complete surgical resection is the gold standard. Long-term regular follow-up with computed tomography should be performed in all patients with primary resection of SFTPs to treat recurrence at an early stage. Further and detailed investigations are necessary to explain and address these gender differences.

No conflict of interest.

ID207

Spatially resolved intra-tumoral heterogeneity reveals metabolic vulnerabilities in pancreatic ductal adenocarcinoma

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Pancreatic ductal adenocarcinoma (PDAC) exhibits profound molecular heterogeneity and poor prognosis, necessitating novel tailored therapies. The basal and classical subtypes—driven by glycolysis and lipid metabolism, respectively—have distinct prognostic implications. We mapped PDAC molecular subtype heterogeneity by spatial transcriptomics of patient tumors, capturing spatially resolved gene expression signatures and generating a comprehensive high-resolution dataset of 42,035 spatial spots. Subtype assignments were validated via multiplex immunofluorescence and parallel quantitative analyses in patient-derived organoids. Basal regions were glycolysis-enriched, whereas classical sites favored lipid metabolism. Targeted PFKFB3 inhibition shifted tumor metabolism toward the classical phenotype, reducing proliferation and enhancing chemotherapy sensitivity. In vivo preclinical models recapitulated these effects and demonstrated that, despite the basal subtype's glycolysis dependence, both classical and basal tumors are susceptible to glycolysis inhibition. By bridging spatial transcriptomics, tumor heterogeneity, metabolic reprogramming, and preclinical validation, this work challenges the dogma of subtype-specific therapeutic silos.

No conflict of interest.

ID208

Prätherapeuthische Aufklärung vor antiresorptiver Therapie: Untersuchung interdisziplinärer Therapie und Kommunikation, Aufklärungskonzepten, Kommunikationsprozessen und der Patientenmeinung zur Aufklärung.

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Die Antiresorptive Therapie mit Bisphosphonaten und Denosumab ist ein essenzieller Bestandteil der Behandlung von Osteoporose und Knochenmetastasen. Trotz ihrer Wirksamkeit birgt sie potenzielle Nebenwirkungen, insbesondere das Risiko einer Medikamenten bedingten Kiefernekrose (MRONJ). Eine umfassende und qualitativ hochwertige Patientenaufklärung vor Therapiebeginn und eine adäquate interdisziplinäre Kommunikation der behandelnden Ärzte ist daher entscheidend, um Risiken zu minimieren und eine interdisziplinäre Betreuung sicherzustellen. Ziel dieser Dissertation ist die Erhebung und Analyse der Aufklärungssituation von Patienten, die eine antiresorptive Therapie erhalten. Hierzu wird eine standardisierte Patientenbefragung durchgeführt, die sich auf verschiedene Aspekte der Aufklärung und interdisziplinären Kommunikation konzentriert. Der Fragebogen umfasst mehrere zentrale Themenbereiche. Zunächst werden die Indikation und die Therapieentscheidung erfasst, indem die Patienten nach ihrer Grunderkrankung (z. B. Osteoporose oder Knochenmetastasen), der verwendeten Medikation (Bisphosphonate, Denosumab oder andere Präparate) sowie der Dauer der Therapie befragt werden. Ein weiterer Schwerpunkt liegt auf der Aufklärung und Information vor Therapiebeginn. Hierbei wird untersucht, welcher Arzt (Hausarzt, Facharzt, Zahnarzt oder Apotheker) die Aufklärung durchgeführt hat, in welcher Form sie erfolgte (mündlich, schriftliches Material, Selbstrecherche) und welche Inhalte vermittelt wurden. Ein weiterer zentraler Aspekt ist die interdisziplinäre Kommunikation. Dabei wird untersucht, ob die Patienten über die notwendige Zahnärztliche Untersuchung vor Beginn der Therapie aufgeklärt wurden und diese tatsächlich wahrgenommen haben und ob sie über das Risiko einer Kiefernekrose sowie präventiver Maßnahmen aufgeklärt wurden. Zudem wird erfasst, ob den Patienten bewusst war, dass zahnärztliche Eingriffe unter antiresorptiver Therapie das Risiko einer Kiefernekrose erhöhen können. Ein wesentlicher Punkt ist auch die Kommunikation zwischen dem überweisenden Arzt und dem behandelnden Zahnarzt. Hierbei wird geprüft, ob ein Austausch stattfand und ob die Patienten schriftliche Dokumente wie einen Laufzettel erhalten haben. Schließlich werden die Patienten hinsichtlich ihrer Compliance und ihres Informationsbedarfs befragt. Dazu gehört die Frage, ob ihnen regelmäßige Zahnärztliche Kontrolluntersuchungen während der Therapie empfohlen wurden und ob sie diese eingehalten haben. Ziel ist es herauszufinden, wie die Patienten die Aufklärung rückblickend bewerten und ob sie das Gefühl haben, dass die Prä-Therapeutische Aufklärung einen Einfluss auf den Krankheitsverlauf hat. Durch die systematische Auswertung der Umfrageergebnisse sollen bestehende Defizite in der Patientenaufklärung und interdisziplinären Kommunikation identifiziert werden. Die gewonnenen Erkenntnisse können dazu beitragen, gezielte Maßnahmen zur Verbesserung der Ärztlichen Beratung und der interdisziplinären Zusammenarbeit zwischen Fachärzten und Zahnärzten zu entwickeln. Langfristig soll so die Qualität der Patientenbetreuung optimiert und das Risiko schwerwiegender Nebenwirkungen der Therapie reduziert werden. Trotz wachsender Erkenntnisse über die Risiken antiresorptiver Medikamente besteht weiterhin eine deutliche Diskrepanz zwischen Leitlinienempfehlungen und der tatsächlichen Aufklärungspraxis im klinischen Alltag. Die bisherige Studienlage basiert zumeist auf retrospektiven Daten oder ärztlichen Einschätzungen – die direkte Perspektive der Patient*innen wurde bislang nur unzureichend erfasst. Die vorliegende Studie schließt genau diese Lücke: Durch eine systematische Befragung von Patient*innen mit antiresorptiver Therapie soll erstmals umfassend erfasst werden, wie diese selbst die Qualität und Verständlichkeit der Aufklärung erleben, welche Informationsquellen sie nutzen und wo sie Defizite sehen. Damit liefert die Studie nicht nur wichtige Daten zur Qualität der Kommunikation, sondern auch konkrete Anhaltspunkte zur Verbesserung von interdisziplinären Abläufen und patientenzentrierter Aufklärung in der Praxis, denn die Patienten Aufklärung ist ein erster und wichtiger Schritt für eine erfolgreiche Therapie.

No conflict of interest.

ID209

Vessel sparing rectosigmoid resection (VSRR) in gynecologic oncology

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Preservation of the superior rectal artery in rectosigmoid resections in gynecologic oncology may reduce the risk of anastomotic leakage. All patients receiving surgery for any gynecologic cancer within 8/2022 and 6/2025 in the gynecologic oncology department of Bonn were reviewed regarding the performance of an anastomosis for gynecologic malignancies. The primary outcome was an anastomotic leakage within 30 days after surgery in case of a rectosigmoid resection. VSRR was compared to usual type rectosigmoid resection (UTRR). A total of 468 surgeries for 10 different cancer types were performed in between 8/2022 and 6/2025. There were 87 anastomoses in total. 58 descendorectostomies were performed. In 25 patients a VSRR was performed. There were 3 anastomotic leakages (3,4%) in total. Regarding the descendorectostomy, there was one leakage (3%) within the usual type rectosigmoid resection group and none in the VSRR group (0%). Preservation of the superior rectal artery is feasable and possibly reduces the risk of anastomotic leakage in gynecologic oncologic surgery.

No conflict of interest.

ID210

Zukunftsangst: Man(n) allein im OP? Systemische Hürden und Geschlechterunterschiede bei der chirurgischen Facharztwahl - Erkenntnisse aus dem OP-Einführungskurs

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Seit dem Sommersemester 2024 wird im OP-Simulationstrakt des Ulmer Trainingshospitals ein curicularer Einführungskurs für alle Studierenden des 5. und 6. Semesters angeboten. Erste Evaluationen zeigten ein geringes Interesse an chirurgischen Fachrichtungen. Ziel dieser Studie war es zu untersuchen, ob (1) der strukturierte Kurs das chirurgische Interesse im Vergleich zur alleinigen Videovorbereitung erhöht, (2) männliche Studierende ein signifikant höheres Interesse an einer chirurgischen Facharztausbildung zeigen, (3) Frauen häufiger systemisch-strukturelle als individuelle Gründe gegen die Chirurgie nennen und (4) sich geschlechtsspezifische Unterschiede in höheren Semestern verstärken. Studierende des Einführungskurses füllten zwei Online-Fragebögen aus – nach Videovorbereitung und nach dem Kurs. Zusätzlich wurde ein Vergleich mit Studierenden des 8. und 9. Semesters (Blocksemester) vorgenommen. Es kamen Skalen vom Likert-Typ (1–5), Einfach-/Mehrfachauswahlen sowie Mann-Whitney-U- und Chi-Quadrat-Test zum Einsatz. Effektstärken wurden über Cramér's V, Phi Koeffizient und Cohen's r berechnet. 114 Studierende füllten den ersten, 110 den zweiten Fragebogen aus. Im Blocksemester nahmen 90 teil. Nach dem Kurs stieg das Interesse an einem operativen Fach signifikant an (Cramér's V = 0,13), ebenso das Interesse an einer chirurgischen Famulatur (Cohen's r = 0,22). Männliche Studierende zeigten ein signifikant höheres Interesse an der Chirurgie (40 % vs. 15,7 %; $\phi = 0{,}316$), während beide Geschlechter zu ungefähr 45 % unentschlossen blieben. Von zehn Gründen gegen die Chirurgie waren sechs systemisch, vier individuell. Frauen nannten signifikant häufiger systemische Hürden (vier signifikante Unterschiede, zwei mit mittlerem Effekt $\phi > 0{,}3$). Im Blocksemester waren die geschlechtsspezifischen Unterschiede im Berufswunsch nicht mehr signifikant (38,5 % Männer, 35,9 % Frauen). Der frühe Einführungskurs fördert chirurgisches Interesse, jedoch mit kleiner Effektstärke. Geschlechtsspezifische Barrieren, insbesondere strukturelle, sind weiterhin relevant und spiegeln aktuelle Literatur wider. Die Angleichung im Blocksemester könnte auf zunehmende klinische Erfahrung und dadurch erworbene Reife hindeuten. Ob dieser Trend bis ins PJ anhält, bleibt offen und soll weiter untersucht werden.

No conflict of interest.

ID211

Oesophageal length in outbred mice can be predicted by age and crown-rump length

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Long-gap oesophageal atresia is a distinct entity of disease with challenges in surgical repair and subsequent management. It is defined by the inability to bring the oesophageal ends together during surgical repair. One approach consists of delayed primary anastomosis: To wait for the overproportionate growth of the oesophagus in the postnatal period, which then allows the primary anastomosis. The current clinical practice is rather diverse with centres waiting between several weeks up to one year. As mice are a relevant model of oesophageal atresia in particular for basic research, we investigated whether oesophageal length could be predicted by age, bodyweight, or crown-rump length. Based on previously published data in rats, we estimated a sample size of 104 mice to be necessary to be able to find a deviation of the regression coefficient from zero for an R^2 of 0.169 with α=0.05 and β=0.9. We therefore included 104 mice of Crl:CD1(ICR) outbred strain background. Of these, two had to be excluded due to being outliers according to Grubbs' test. We then constructed a multivariable regression model of oesophageal length with the independent variables of age, bodyweight, and crown-rump length. Homoscedasticity of the residuals was evaluated using Bartlett's test and their normality via the Shapiro-Wilk test. Results: Our model was statistically significant ($F(3,126)=49.88$, $P<0.001$) with an adjusted R^2 of 0.532. Both the independent predictors of age ($t=4.351$, $P<0.001$) and crown-rump length ($t=5.435$, $P<0.001$) were associated to oesophageal length, whereas this assumption was less compatible for bodyweight ($t= -1.937$, $P=0.055$). There was no multicollinearity among the independent predictors (variance inflation factors were 2.11, 2.47, and 1.78 respectively). Oesophageal length in millimetres could be described by 17.03 + age in days * 0.07 – bodyweight in grams * 0.1 + crown-rump length in millimetres * 0.26. Relevant predictors of oesophageal length in outbred mice were age and crown-rump length, whereas bodyweight was less likely to have an influence. This is in contrast to results from rats in which bodyweight was the decisive factor. However, this indicates that different species have to be selected differently in order to be able to achieve transferrable results to aid patient care, which would otherwise be obscured by species-specific aspects or generate just spurious results without relevance for the human disease.

No conflict of interest.

ID212

Both oesophago-oesophageal and duodeno-oesophageal anastomoses are inferior to the native oesophagus in terms of breaking force

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The standard animal model for oesophageal adenocarcinoma is based on Levrat's description of cancer development following oesophageal-duodenal anastomoses. This has been adapted to mice to enable the use of genetically modified organisms in basic oesophageal cancer research. However, compared to Levrat's rat model, the mouse model is less reliably successful in inducing carcinoma. Different surgical techniques have been employed to anastomose the oesophagus after tumour resections to study the development of distant metastases. Rodent models are particularly vulnerable to anastomotic complications and subsequent death. We therefore investigated whether commonly used anastomoses offer mechanical durability comparable to the native organ. We included 104 native murine oesophagi, 34 oesophago-oesophageal anastomoses, and 19 oesophago-duodenal anastomoses based on a sample size analysis, which relied on previously published data in order to achieve a power of 90% with an alpha-level of 0.05. Mice from which these organs were harvested were of Crl:CD1(ICR) background. Anastomoses were formed in a standardised fashion with four stitches of 7-0 prolene. Native oesophagi and anastomoses were subjected to linearly increasing traction forces in a motorised test stand and the force necessary to disrupt the anastomosis was recorded. We tested for normality with the Anderson-Darling test and compared both anastomoses to the native oesophagi with a oneway analysis of variance with post-hoc two stage linear step up procedures of Benjamini, Krieger and Yekutieli after a log-transformation of the obtained force measurements. Results: Native oesophagi withstood mean traction forces of 1.46 N (SD 1.31), oesophago-oesophageal 0.56 N (SD 0.17), and oesophago-duodenal 0.52 N (SD 0.33). ANOVA showed significant differences ($F(2,156)=37.4$, $P= <0,0001$). Post-hoc tests revealed both anastomoses were inferior: oesophago-oesophageal ($t=6.93$, $df=156$, $P<0.001$) and oesophago-duodenal ($t=6.41$, $df=156$, $P<0.001$). As before in rats, the oesophago-oesophageal anastomoses sustained traction forces of only 38% of the native organ. Likewise, oesophago-duodenal anastomoses had a resistance to traction forces of 35% of the native oesophagus. This in-vitro finding might contribute to the high amount of losses of experimental mice after oesophageal resection due to anastomotic complications.

No conflict of interest.

ID213

Surgical Strategy in Acute Mesenteric Ischemia: Planned vs. On-Demand Relaparotomy - A Question of Survival

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Acute mesenteric ischemia (AMI) remains a complex surgical challenge with persistently high lethality. After exploratory laparotomy, it is unclear whether a planned relaparotomy within 12 to 36 hours or a demand-based ("on-demand") approach results in better outcomes. Current international guidelines do not provide definitive recommendations on the indications for a planned relaparotomy. This study aimed to investigate the prognostic impact of the surgical strategy (planned vs. on-demand relaparotomy) and to identify preoperative risk factors affecting patient outcomes. We retrospectively analysed patients who underwent surgery for AMI at the University Hospital Bonn between July 2005 and December 2022. Demographic data, comorbidities, and intra- and postoperative findings were collected. Thirty-day and one-year survival rates were calculated, and preoperative risk factors were assessed for their impact on lethality. A total of 95 patients were included. The 30-day survival rate was 69.5% and the one-year survival rate 52.6%. Patients undergoing planned relaparotomy demonstrated significantly higher survival rates at both 30 days and one year compared to the on-demand group (30-day survival rate: 83.8% vs. 60.3%, p = 0.013 | one-year survival rate: 64.9% vs. 44.8%, p = 0.046). Higher age (30-day lethality: OR 1.08, 95% CI 1.03-1.14, p = 0.004 | one-year lethality: OR 1.06, 95% CI 1.02-1.11, p = 0.007) and elevated preoperative serum lactate levels (30-day lethality: OR 1.22, 95% CI 1.05-1.47, p = 0.015 | one-year lethality: OR 1.22, 95% CI 1.04-1.50, p = 0.030) were identified as independent predictors of increased lethality in multivariate analysis. Pre-existing renal insufficiency was significantly associated with lethality in univariate analysis but was not an independent risk factor in the multivariate model. The results clearly demonstrate the prognostic impact of the chosen surgical strategy in AMI. Planned relaparotomy significantly improves both short- and long-term survival and should be favoured for appropriate patients. Age and elevated preoperative serum lactate levels are strong predictors of lethality and enable precise preoperative risk stratification. These findings support a proactive surgical approach and emphasise the need for standardised decision-making processes in AMI management.

No conflict of interest.

ID214

The prospective multicenter ASSESS-Trial: Benchmarking laparoscopic training in Germany

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Training in minimally invasive surgery (MIS) is essential to master the steep learning curve and build confidence for real procedures. Dry lab training like “Fundamentals of Laparoscopic Surgery” (FLS) provide valuable structure, yet lack benchmark criteria in Germany, limiting comparability and motivation. The prospective ASSESS-Trial aims to establish the first benchmark dataset for the FLS curriculum, enabling comparability within peer groups and across centers, and supporting national performance feedback. This prospective, multicenter study includes students and physicians working at surgical clinics (visceral, thoracic, vascular, pediatric surgery, gynecology, urology) in Germany between 11/2023 and 11/2024. Participating centers were visited individually. The primary aim was to establish a national benchmark dataset covering three key FLS tasks: PEG transfer, precise cutting, and intracorporeal knot tying. Analysis parameters included task time, error rates, instrument motion metrics, and force exertion. To generate peer-group standardized benchmarks, participants reported their surgical experience (position, duration of surgical practice) and clinic characteristics (number of surgeons, beds). The ASSESS trial was conducted across 54 centers over 12 months, including 104 students (15.5%) and 558 physicians (84.5%). Of all participants, 180 (32.3%) were female, 280 (50.2%) male, and 87 (15.6%) undisclosed. Among physicians, 254 (45.9%) were residents, 88 (15.9%) fellows, 126 (22.8%) consultants, 58 (10.5%) senior consultants, and 27 (4.9%) heads of department. Distinct benchmark criteria were identified for each group, with significant differences ($p < 0.001$) in time, motion, and force parameters across all tasks. Notably, heads of department were fastest in precise cutting and intracorporeal knot tying but applied 0.5–1 N more force. Volume of motion and path length proved valuable for differentiating peer groups and establishing clear benchmark standards. This is the first multicenter benchmark dataset for the FLS, allowing MIS training centers and dry labs to compare performance across peer groups. The data show that performance in FLS tasks does not simply improve linearly with experience. More complex parameters such as force exertion and motion volume provide a clearer, more nuanced distinction between groups. This dataset significantly enhances dry lab training by improving comparability and boosting motivation.

No conflict of interest.

ID215

Esophageal anastomotic stricture severity increases linearly with anastomotic tension – an experimental study in swine

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Oesophageal anastomotic strictures occur more often when the ends are brought together under tension, but this association has not been experimentally evaluated in detail. We aimed to systematically study these issues in a swine model, as the porcine oesophagus is considered to be structurally similar to that of humans. This is of crucial relevance as postoperative oesophageal strictures are a common cause of relevant morbidity following oesophageal atresia repair. We divided the oesophagus in three-week old Pietrain piglets (5.2kg±0.45kg) at the carinal level and re-anastomosed it directly (n=4), and after resections of one (n=4), three (n=5), and five (n=6) centimeters. These were compared to shams (n=4). The piglets were followed for two weeks for clinical signs of esophageal stenosis and euthanized after esophageal fluoroscopy. We calculated the lateral esophageal stricture index and conducted a semi-quantitative assessment of stricture severity using the explanted esophagus, in which we also investigated stenotic length. Categorical data were analyzed using the Chi-squared-test for trend and numerical data with linear regression in a blinded fashion: Piglets were given arbitrary numbers to conceal their resection length from the analyzer. Regurgitation of fodder followed an increasing linear trend from Shams to five centimeter resection lengths (P=0.0005; figure A), as did stricture severity (P=0.0035; figure B). Moreover, resection length also was a predictor of fluoroscopic oesophageal stenosis: While stenosis was absent in Shams, the stenotic index increased linearly from 0.51 (95% CI: 0.38–0.65) with 0.05 (95% CI: 0.003–0.09) per additional centimeter resection (F(1,17)=4.992; P=0.0392). Macroscopic stenotic length had no relationship to resection length (F(1,17)=0.004; P=0.95). The severity of oesophageal strictures in piglets increases clinically, macroscopically and radiologically with the amount of anastomotic tension. Since humans and swine share anatomically similar oesophagi, we assume that a similar relationship might be present in humans, too, which has been indicated by registry data from human oesophageal atresia registers. The next steps would be to uncover the underlying molecular mechanisms triggering the stenosis development.

No conflict of interest.

ID216

Stereo-EEG guided Radiofrequency Thermocoagulation for Drug-Resistant Focal Epilepsy: Initial Results from 15 Patients at a Tertiary Epilepsy Center

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Radiofrequency thermocoagulation (RFTC), as a minimally invasive treatment method, can serve as an alternative to resective epilepsy surgery for drug-resistant focal epilepsy. Using implanted EEG depth electrodes, the seizure-generating network components are first identified and then inactivated through thermal ablation using high-frequency electrical pulses. Here, we present our experiences and preliminary results following the implementation of this treatment method in our epilepsy center with a cohort of 15 patients. The aim was to evaluate and analyze the treated population with regard to technical aspects, underlying pathologies, treatment-associated complications, and seizure outcomes. A retrospective observational study was conducted on 15 consecutive patients with pharmacoresistant focal epilepsy over 24 months. Dixi Medical depth electrodes (DE) were used for RFTC. Thermal ablation was performed by applying bipolar voltage between adjacent contacts (maximum power: 8.3 watts; maximum duration: 60 seconds). Seizure outcomes were evaluated using the ILAE classification. Patients were divided into two groups (seizure-free [SF] vs. non-seizure-free [non-SF]) for analysis. The study included 15 patients (8 male) with an average age of 31.8 years and a mean follow-up duration of 6.8 months (range: 1–20 months). A median of 9 DEs (4–16) were implanted per patient, and RFTC was performed on a median of 2.5 DEs (1–8), generating a median of 9.5 lesions (1–22). At the last follow-up, 7 patients (46.7%) were seizure-free. The responder rate, defined as ≥50% reduction in seizures, was 80%. Two patients (13%) with ILAE Class 3 outcomes after RFTC underwent lesionectomy at 9 and 6 months, respectively, resulting in postoperative seizure freedom. The proportion of patients with distinct localized lesions (FCD, PVNH, and HH) was significantly higher in the SF group compared to the non-SF group (100% vs. 37.5%; p=0.01). No complications or neurological deficits were observed in any patient following RFTC. Our initial experiences suggest that SEEG-guided RFTC is a promising and safe treatment option for carefully selected patients. In particular, patients with localized, well-defined lesions appear to have a higher likelihood of achieving seizure freedom. Further studies are needed, especially to identify patient-specific biomarkers or other predictors associated with higher rates of seizure freedom.

No conflict of interest.

ID217

Cable ties for lateral plate fixation in minimal invasive repair of pectus carinatum (MIRPC)

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A number of complications have been reported in the literature regarding costal plate fixation using steel wires in minimal invasive repair of pectus carinatum (MIRPC). These include rib fractures due to wire cut-outs or pleural perforation. The present study investigated the use of cable ties as an alternative technique for costal plate fixation in a human cadaver model. Nine human cadaver were subjected to a MIRPC using the Abramson-Yüksel technique. Bilateral plate fixation was performed in each body either using braided steel (Group A) wires or 4 mm polyether ether ketone (PEEK) cable ties (Group B). Specimens were then subjected to standardized continuous (from -150 to 150 N) and dynamic (from -100 to 100 N) pull and push force. Load-to-failure testing was performed after 300 dynamic loading cycles. Slipping of the plates between markers, rib fractures due to cut-outs and max. loading force were compared. The average distance between markers during continuous pull and push force was 3,8 mm (Group A) and 3,7 mm (Group B). There was no significant difference between markers after 300 cycles dynamic testing in both groups. Noticeable longer stretch was observed in both groups equally at beginning of dynamic testing to achieve 100 N. Max. force in load-to-failure testing was 600N and was achieved in 2 vs. 4 cases (Group A vs. B). Cut-outs were observed in 7 of 9 cases (Group A) vs. 3 of 9 cases (Group B) in load- to-failure testing. No implant failure was detected in Group A or B. Study results confirmed our initial hypothesis concerning equal stability of PEEK cable ties compared to standard steel wire fixation of lateral costal fixation plates. Cable ties for lateral plate fixation in MIRPC is easily and securely achievable, obviating the risk of increased rib fractures due to wire cut-outs.

No conflict of interest.

ID218

Seizure freedom achieved with SEEG-guided thermocoagulation in drug-resistant focal epilepsy from a hypothalamic hamartoma: a case report

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Hypothalamic hamartomas (HH) are a recognized cause of structural epilepsy, often presenting as refractory epilepsy with limited pharmacological treatment options. Due to the localization of HH, surgical approaches carry significant risks, making them less viable. Evaluating HH as a source of epileptogenic activity during invasive presurgical diagnostics, such as stereo-EEG (SEEG), poses additional challenges. This case report describes the treatment of a patient with HH and refractory focal epilepsy using SEEG-guided radiofrequency thermocoagulation (SEEGgRFTC) as a minimally invasive, awake procedure. We present the case of a 26-year-old male with drug-resistant focal epilepsy due to a left-sided hypothalamic hamartoma classified as type 2 according to the Delalande classification. Depth electrodes (Dixi Medical) were utilized for SEEG evaluation and SEEGgRFTC. Seizure outcomes were assessed using the ILAE classification system. The patient had a history of epilepsy since the age of 11. The MRI revealed a non-contrast-enhancing lesion, approximately 0.7 cm in diameter, in the left hypothalamus, consistent with the morphology of a HH. Video-scalp EEG diagnostics localized an epilepsy focus frontocentrally. An interdisciplinary decision was made to perform invasive EEG monitoring, which was performed without complications. SEEG confirmed HH as the source of epileptogenic activity, with two medial contacts of an electrode implanted in the HH showing focal epileptogenic discharges. Based on these findings, SEEGgRFTC was successfully performed on the identified contacts without perioperative complications. Post-interventional an MRI confirmed the desired iatrogenic lesion within the HH. At six months follow-up the patient remains seizure-free (ILAE Class 1). SEEG has long been established in epilepsy surgery for invasive evaluations. Combining SEEG with SEEGgRFTC represents a promising, minimally invasive, and safe treatment option for refractory focal epilepsy caused by distinct localized epileptogenic lesions such as HH. Nonetheless, the limitations imposed by lesion size must be carefully considered when selecting candidates.

No conflict of interest.

ID219

Einsatz von Mobile App-Gestütztem Remote Patient Management in der Thoraxchirurgie: Implementierung und Adhärenz

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Remote Patient Management (RPM) durch digitale Applikationen auf mobilen Endgeräten bietet die Möglichkeit, PatientInnen entlang definierter Pfade im perioperativen Behandlungsablauf zu unterstützen. Dies betrifft besonders die extra-stationären Phasen vor der Aufnahme und nach der Entlassung aus der Klinik und kann somit die Prä- und Rehabilitation im Sinne moderner ERAS-Konzepte unterstützen. Gleichzeitig können Kommunikationswege zwischen PatientInnen und dem Behandlungsteam vereinfacht und optimiert sowie Patient Reported Outcomes (PRO) erhoben werden. Mehr als ein Jahrzehnt seit der allgemeinen Etablierung des Smartphones ist anzunehmen, dass auch PatientInnen im typischen Inzidenzalter von Lungenkrebs eine ausreichende Affinität und digitale Handlungskompetenz für App-gestützte Lösungen haben. Wir beschreiben die ersten Erfahrungen und Adhärenzdaten aus der Implementierung von digital begleiteten Patientenpfaden in unserem Zentrum. Eine Web- und mobile App-basierte RPM-Lösung (Maela/Get Ready®, Fa. MN Sante/Medtronic) wurde zur digitalen perioperativen Begleitung von thoraxchirurgischen PatientInnen für onkologische und nicht-onkologische Fälle implementiert. Die programmierten Pfade enthielten Edukationsinhalte sowie Erinnerungen, Scores und Fragebögen. Wir führten eine retrospektive Analyse der Metadaten aus der Pilotkohorte durch. Seit dem Beginn der Pilotphase wurden 50 PatientInnen ins Programm eingeschlossen, von denen bisher 32 PatientInnen das Pfadende erreicht haben. Diese haben 84% (n=1605) des in den Pfaden vorgegebenen Contents (n=1910) erfolgreich bearbeitet. Das mediane Alter der Teilnehmer betrug 66 Jahre. Ein signifikanter Unterschied zwischen den Geschlechtern liegt bei der Adhärenz nicht vor. Die erhobenen Adhärenzwerte verdeutlichen das Potenzial für eine nachhaltige Implementierung des Programms. Künftige Erweiterungen der Lösung wie die Anbindung von Wearables zum Vitalwertemonitoring können Erweiterungen der ERAS-Pfade bis hin zu Hospital-at-home-Konzepten ermöglichen.

Conflict of interest:

Der Referent Jan Arensmeyer hält eine Minderheitsbeteiligung bei und erhielt Referentenhonorare von der Medicalholodeck AG, Zürich, Schweiz. Er erhielt ein Referentenhonorar von der Chiesi GmbH, Hamburg, Deutschland. Er übt eine Beratungstätigkeit für die Richard Wolf GmbH, Knittlingen, Deutschland aus. Er erhielt eine Reisekostenübernahme sowie ein Referentenhonorar von Medtronic Deutschland, Meerbusch, Deutschland. Der Referent ist Gesellschafter der F&A Consulting UG (haftungsbeschränkt), Grafschaft, Deutschland.

ID220

The value of perioperative anemia in spinal metastases in the context of neurosurgical-oncological treatment

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Neurosurgical resection (NR) of spinal metastasis (SM) is an established therapeutic procedure, including decompression with or without stabilization. Perioperative anemia continues to be a challenge in the context of surgical treatment. The aim of this study was to find out to what extent perioperative anemia influences the risk of perioperative complications. We conducted a retrospective analysis of oncologic patients who underwent NR of SM between 2013 and 2025 at our spine center. Logistic regression analysis was used to examine the impact of perioperative hemoglobin levels on complications and survival after surgical treatment. A total of 278 patients were included in the analysis. Mild-to-moderate preoperative anemia was presented in 55.8% and 3.6% with severe anemia. Postoperative hemoglobin levels were significantly associated with adverse events (p=0.034), with the highest complication rate observed in patients with Hb < 8 g/dL (28.1%). Preoperative hemoglobin demonstrated a significant association with postoperative functional outcomes as well as 30-day (p=0.008) and 1-year mortality (p=0.014). Lower postoperative hemoglobin levels significantly increase the risk of postoperative complications and prolonged hospitalization; each 1 g/dL increase in hemoglobin is associated with approximately a 62% reduction in the odds of adverse outcomes.

No conflict of interest.

ID221

Development of a Realistic 3D-Printed Thoracic Model for Ultrasound-Guided Intervention Training and Imaging Research

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High-fidelity simulation models have demonstrated their ability to accelerate early skill acquisition and enhance procedural confidence. Thoracic interventions, such as thoracentesis and chest tube placement, via open or percutaneous techniques, are widely performed across medical specialties. Existing synthetic training models often lack anatomical realism and ultrasound capabilities, or are expensive. This highlights the need for realistic, affordable thoracic models that support both training and research in ultrasound-guided procedures. Patient-derived CT data were segmented using the MONAI Auto3DSeg extension and post-processed within 3D Slicer. Skeletal elements were 3D-printed using Ultrafuse PLA (BASF SE, Ludwigshafen, Germany) on a Prusa XL (Prusa Research a.s., Prague, Czech Republic) equipped with five tool heads. Hilar structures and lung parenchyma were segmented, deformed in Blender (Blender Foundation, Amsterdam, Netherlands), and printed with Filaflex 60A PRO (Recreus Industries S.L, Valencia, Spain). Negative molds for casting (chest wall, diaphragm, intercostal spaces) were generated in Blender and printed with Varioshore TPU (colorFabb BV, Belfeld, Netherlands). Casting was performed using freeze-thaw cycles with pigmented polyvinyl alcohol (Sigma Aldrich Co. LLC, St. Louis, Missouri, USA) to simulate tissue elasticity. This method accurately replicates key thoracic structures, such as ribs, diaphragm, lung, and pleural effusion, with clear anatomical and sonographic fidelity. It supports realistic simulation of local anesthesia, as well as both needle-guided and open chest tube insertions. It is particularly well suited for repeated percutaneous training without compromising structural integrity. The segmentation-based workflow enables anatomical replication across different ages, body types, and pathologies, including pediatric anatomies, by allowing the model to be generated from any patient dataset. Our multi-material, 3D-printed thoracic model accurately replicates key anatomical and sonographic features. It serves as a versatile tool for hands-on procedural training, ultrasound education, and as a physical ground truth for imaging research and algorithm development. Using open-source software and commercially widely available materials ensures cost-effective reproducibility, scalability, and adaptability across training environments.

No conflict of interest.

ID222

Cathepsin S (CTSS) gene expression correlates with increased rates of anastomotic leakage after lower anterior resection for colorectal cancer

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Anastomotic leakage (AL) is a common complication after surgery due to colorectal cancer (CRC), impairing patients' short-term and long-term outcome. Lower anterior resection (LAR) is associated with higher AL rates compared to other types of intestinal resections and bowel reconstructions. However, the underlying reason remains unclear. We hypothesized that the immunological microenvironment of the rectum mucosa facilitates AL after LAR. Clinical data from 360 patients who underwent surgery for CRC as well as biopsies of healthy mucosa from different anatomical regions were collected. The immunological microenvironment was determined by immunohistochemical staining of CD68+, CCR4+, and CD206+ macrophages. Utilizing targeted transcriptomics, inflammatory gene expression levels were detected. We discovered a lower number of CD68+ macrophages within colon mucosa compared to rectum mucosa. M1 polarized CCR4+ macrophages were more abundant in rectum mucosa, while M2 polarized CD206+ macrophages were less frequent within rectum mucosa. A low number of profibrogenic M2 macrophages within the rectum correlated with AL. Gene expression analysis revealed a significant upregulation of the pro-inflammatory gene cathepsin S (CTSS) within rectum mucosa and an increased CTSS expression was associated with higher AL rates after LAR but not after colectomy. CTSS, likely secreted by macrophages, confers a proinflammatory microenvironment within the anastomotic region after LAR and correlates with AL development. The immunological differences between colon and rectum mucosa might explain the comparatively increased AL rates after LAR.

No conflict of interest.

ID223

Modeling Antiviral Immunity in Human Skin: Insights from Ex Vivo Culture Systems

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The skin serves as the first line of defense of the body and is constantly exposed to environmental hazards such as pathogens, UV light, and chemicals. In viral infections, the skin is often the first challenged organ, and many viruses bypass the physical barrier of cornified skin through lesions, bites, or scratches, gaining access to permissive keratinocytes. The innate immune system is pivotal in mounting rapid responses against such threats, involving crosstalk between immune and non-immune cells. Our research explores how innate immune sensors, like the NLRP1 inflammasome, or interferon-induced proteins, recognize and counteract viral infections to limit their spread. We employ advanced tools, including inflammasome reporters, recombinant poxviruses, herpesviruses, and alphaviruses, as well as camelid-derived nanobodies. We aim to unravel the molecular crosstalk between different defense systems and cell types. To visualize these interactions and model inflammation in a realistic skin context, we have established the cultivation and infection of human skin explants, epidermal sheets, skin graft tissue, and primary keratinocytes. These systems provide a unique opportunity to uncover how inflammation is coordinated at the single-cell level and within the broader tissue context. By delving into the molecular interactions between viruses and host immune factors, our work aims to reveal conserved viral targets recognized by the innate immune system, offering novel targets for antiviral therapies.

No conflict of interest.

ID224

Impact of patient age and trauma mechanisms on clavicle fractures

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The energy associated with a traumatic event can potentially impact the severity of fractures, nevertheless, there is a dearth of studies exploring the correlation between trauma energy and incidence and morphology of clavicle fractures. Despite age and trauma mechanism other aspects may have an influence on fracture incidence and morphology. The aim of this study was to examine the impact of specific patient-related and trauma-related parameters on the occurrence and type of clavicle fractures. All patients referred to a European Level I trauma centre diagnosed with a clavicle fracture were included over a six-years period. Information regarding demographics, time of injury, mechanism of injury, injured side, fracture classification and morphology as well as presence and type associated lesions and treatment were extracted and analysed in uni- and multivariate analyses and multinomial logistic regression. 255 patients were included; almost 65% of injuries involved road traffic accidents, 40% of which were classified as high-energy. Age had a significant effect on the mechanism of injury and involvement in RTAs. Sex had a significant impact on RTA involvement but no significant effect on the mechanism of injury. Associated injuries were reported by more than 70% of the patients, with injuries of the chest wall or proximal upper limb present in 45.9% of cases, with the mechanism of injury influencing the presence of these associated lesions. Midshaft fractures were the most frequently observed but neither age nor trauma mechanism showed a significant association with fracture classification, clavicle shortening, or fracture displacement. A high prevalence of associated injuries is to be expected in patients presenting clavicle fractures referred to a Level I trauma centre. Age and sex are relevant independent variables in determining the mechanisms of injury, but neither the patients' age nor the mechanism of injury demonstrate a discernible impact on the radiological characteristics of clavicle fractures.

No conflict of interest.

ID225

Einfluss der postbariatrischen Behandlung auf die Liposuktionstherapie des Lipödems im Stadium III

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Beim Lipödem im Stadium III ist bei vorliegender Adipositas (ab Grad II mit BMI > 35 kg/m²) eine Adipositastherapie empfohlen. Komparative Daten zur operativen Lipödembehandlung an den Extremitäten mittels Liposuktion von postbariatrischen Patienten liegen bislang nur in unzureichender Anzahl vor. Die Behandlungsverläufe von Lipödempatienten im Stadium III mit und ohne bariatrische Vorbehandlung werden retrospektiv in einer Fall-Kontrollstudie untersucht. In die Untersuchung werden n=16 postbariatrische (Behandlungsgruppe) und n=22 nicht-bariatrische Patienten (Kontrollgruppe) mit Lipödemstadium III eingeschlossen, die zwischen 2021 und 2025 operativ versorgt wurden. Es erfolgt ein Vergleich der Liposuktionsvolumina und Gewichtsveränderungen innerhalb der ersten vier Liposuktionssitzungen. In der postbariatrischen Behandlungsgruppe lagen das Maximalgewicht bei 163±41 kg und das Körpergewicht vor Beginn der operativen Lipödemtherapie bei 99±28 kg, während in der Kontrollgruppe Ersteres bei 117±32 kg ($p<0.001$) und Letzteres bei 114±31 kg ($p>0.05$) lagen. Bei 75,0% der Patientin der Behandlungs- vs. 100% der Kontrollgruppe ($p<0.05$) waren eine zweite Liposuktion, bei 68,8 vs. 86,4% eine dritte und bei 37,5 vs. 68,2% eine vierte Liposuktion indiziert ($p>0.05$). Im Schnitt wurden pro Sitzung signifikant weniger bei postbariatrischen Patienten (4032±1684 ml) als bei den Kontrollen abgesaugt (5785±1422 ml, $p<0.05$). In Bezug auf den absoluten und relativen Gewichtsverlauf nach Liposuktion zeigen sich keine signifikanten Unterschiede zwischen den Gruppen. Nach vier Liposuktionen zeigt sich pro abgesaugter Liter eine durchschnittliche Reduktion des Körpergewichtes postoperativ von 0,4±0,6 kg bei bariatrischen vs. 0,6±0,2 kg bei nicht-postbariatrischen Patienten ($p>0.05$). In der postbariatrischen Gruppe wurden vor ($p<0.001$) und nach ($p<0.05$) Liposuktionstherapie signifikant mehr Straffungsoperationen durchgeführt. Bei Lipödempatienten im Stadium III kann die postbariatrische Vorbehandlung bei begleitend vorliegender Adipositas Einfluss auf die Anzahl und Absaugmenge der Liposuktionen haben. Obwohl die durchschnittlichen Absaugmengen in der nicht-bariatrischen Gruppe höher sind, führen diese nicht zu einer höheren, postoperativen Gewichtsabnahme im Gruppenvergleich. Im Gegensatz zu postbariatrischen Patienten, führt die Liposuktion bei adipösen, nicht-bariatrischen Patienten nicht zu vermehrten Straffungsoperationen.

No conflict of interest.

ID226

Reduzieren Perforatorlappenplastiken bei der thorakalen und sternalen Rekonstruktion den postoperativen Albuminverlust und Transfusionsbedarf im Vergleich zu Muskellappenplastiken?

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Muskellappenplastiken stellen etablierte Techniken bei der thorakalen und sternalen Rekonstruktion dar. Fasziokutane Perforatorlappenplastiken bieten moderne und schonende Möglichkeiten für den Gewebeersatz in den genannten Bereichen ohne muskulären Hebedefekt. In der folgenden Studie soll untersucht werden, ob der Einsatz von Perforatorlappen im Vergleich zu Muskellappen zu einem verminderten postoperativen Albuminverlust und Transfusionsbedarf führt. Zur thorakalen und sternalen Rekonstruktion wurden zwischen 2021 bis 2025 n=26 Perforatorlappenplastiken (n=22 Internal Mammary Artery Perforator [IMAP]-Lappen; n=6 Superior Epigastric Artery Perforator [SEAP]-Lappen) eingesetzt. Es erfolgt ein retrospektiver Vergleich des postoperativen Albuminverlustes und Transfusionsbedarfs nach Perforatorlappen- versus Muskellappenversorgungen mittels Latissimus-dorsi (LD)-Lappen (n=42) und Pectoralis-major (PM)-Lappen (n=18) am gleichen Standort. Im Vergleich zu Perforatorlappenplastiken (-3,2±4,4 g/l) kommt es nach LD-Lappenversorgungen zu einer signifikanten Reduktion des Serumalbumins um -5,2±3,3 g/l ($p<0.01$). Im Gegensatz dazu ist der postoperative Albuminverlust nach PM-Lappenplastik geringer und im Vergleich zu dem nach Perforatorlappen nicht signifikant (-4,4±3,6 g/l, $p>0.05$). Der postoperative Hb-Wert ist nach LD-Lappenversorgungen signifikant niedriger als nach Perforatorlappenplastiken (8,8±1,2 vs. 9,5±1,1 g/dl, $p<0.05$), während dies nach PM-Lappenplastik nicht der Fall ist (10,1±1,8 g/dl, $p>0.05$). Der postoperative Transfusionsbedarf nach LD-Lappenplastik ($p<0.05$) ist signifikant erhöht bei durchschnittlich 1,8±2,4 Erythrozytenkonzentraten (EKs) im Vergleich zu 0,7±0,9 EKs nach Perforatorlappenversorgung. Nach PM-Lappenplastiken werden gemittelt 0,7±1,4 EKs postoperativ benötigt ($p>0.05$). Neue Perforatorlappentechniken tragen zu einem verminderten postoperativen Albuminverlust und einem reduzierten Transfusionsbedarf bei. Die Unterschiede zeigen sich insbesondere im Vergleich zur LD-Lappenplastik. Moderne, gefäßgestielte Perforatorlappen können zu einer verminderten postoperativen Morbidität beitragen, welche vorteilhaft bei der Rekonstruktion von multimorbiden, intensivpflichtigen und kritischen Patienten sein können. Weitere Studien sind notwendig, um den Einsatz von Perforatorlappenplastiken in diesem Kontext weiter zu evaluieren.

No conflict of interest.

ID227

Rekonstruktion von Bauchdeckendefekten nach offener Abdominalbehandlung mit Perforatorlappen des superioren und tiefen inferioren epigastrischen Gefäßsystems

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Die offene Abdominalbehandlung (open abdomen treatment – OAT) ist assoziiert mit einer signifikanten Morbidität und Mortalität. Wenn ein primärer oder sekundärer Faszienverschluss nicht erreicht werden kann, sind vakuumassistierter Wundverschluss und Polyglactin-Netzeinlage indiziert. Ist ein sekundärer Hautverschluss nicht möglich, stellen eine Sekundärheilung oder Spalthauttransplantation gängige Therapiestrategien dar. Enteroatmosphärische Fisteln können durch unzureichende Wundheilung der Hautweichteilumgebung resultieren. Perforatorbasierte Propeller-Lappenplastiken wurden bislang nur für die onkoplastische Bauchdeckenrekonstruktion beschrieben. Wir beschreiben erstmalig die Rekonstruktion von Bauchdeckendefekten in zwei Fällen nach OAT, die mittels Perforatorlappen des superioren und tiefen inferioren epigastrischen Gefäßsystems durchgeführt wurden. Wir berichten über den erfolgreichen Einsatz einer Superior Epigastric Artery Perforator (SEAP)-Lappenplastik im ersten Fallbericht zur komplexen Rekonstruktion eines 20 x 8 cm und einer Deep Inferior Epigastric Artery Perforator (DIEP)-Lappenplastik im zweiten Fallbericht zur Deckung eines 22 x 10 cm messenden komplizierten Bauchdeckendefektes nach OAT. Die SEAP-Lappenplastik wurde vom Oberbauch und die DIEP-Lappenplastik vom Unterbauch gestielt an ihren Gefäßperforatorgefäßen gehoben und in Propellerlappentechnik in die jeweiligen Mittelbauchdefekte transpositioniert. Die Lappenentnahmestellen konnten jeweils primär verschlossen werden. Beim 1-Jahres Follow-up zeigten sich beide Rekonstruktionen vollständig abgeheilt, wobei beide Patienten asymptomatische Bauchwandhernien entwickelten. Bei guter Zufriedenheit mit dem postoperativen Ergebnissen und wegen Sorgen über mögliche postoperative Komplikationen entschieden sich die Patienten gegen eine sekundäre Bauchwandrekonstruktion. Gestielte Perforatorlappen des superioren und tiefen inferioren epigastrischen Gefäßsystems stellen nützliche Optionen für die Rekonstruktion von Mittelliniendefekten am Abdomen dar, ohne Notwendigkeit für eine Stielverlängerung oder mikrochirurgische Anastomose. Kritisch erkrankte Patienten, die eine plastische Wiederherstellung der Bauchdecke nach OAT benötigen, können von den präsentierten Propellerlappen profitieren und instabile abdominelle Narbenplatten nach insuffizienter Wundgranulation oder Spalthauttransplantation vermieden werden.

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No conflict of interest.

ID228

Rapid Intraoperative Resection Margin Analysis in Brain Metastases Surgery via Stimulated Raman Histology and Artificial Intelligence

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The extent of resection (EOR) plays a decisive role in brain metastasis (BM) surgery; however, intraoperative margin assessment still depends largely on the surgeon's subjective evaluation, frequently resulting in incomplete resection rates. This study investigates the feasibility of stimulated Raman histology (SRH) combined with artificial intelligence (AI)-based algorithms for rapid intraoperative tissue analysis for margin assessment in BM surgery. In this prospective, observational diagnostic study, adult patients scheduled for complete resection of non-eloquent brain metastases, as determined by our center's interdisciplinary tumor board in 2024, were screened. SRH images were acquired from 1 mm^3 tissue samples at predefined locations of the resection cavity after the surgeon assessed the resection as complete. A minimum of four margin samples per cavity were collected, plus a sample from the tumor core. The images were analyzed using a pre-validated AI algorithm1 classifying tissue as 'tumor', 'non-tumor', or 'low quality' based on a tumor reveal score. The surgeon was blinded to the AI results to avoid intraoperative bias. All tissue samples underwent routine histopathology as the gold standard for detecting microscopic tumor presence. EOR was further assessed by postoperative MRI within 72 hours. A total of 26 patients were enrolled with 221 SRH images from 119 resection margins (34.6% located in the posterior fossa, 15.4% recurrent tumors). Microscopic residual tumor was identified in 19.2% of patients. An AI tumor reveal threshold of 55 was optimal to differentiate tumor from non-tumor tissue, achieving 88.2% diagnostic accuracy for detecting microscopic tumor at the margins. Sensitivity was 83.3%, specificity 88.5%, area under the curve was 85.9%, and an exceptionally high negative predictive value of 99.0%. Subgroup analysis showed significantly more false positives in posterior fossa samples ($p = 0.007$). MRI correlation analyses are in progress. SRH imaging offers a promising technique for rapid intraoperative margin assessment in BM surgery. However, the AI tumor reveal threshold should be adapted for BM cases, particularly to reduce interference by the hypercellular granular layer in cerebellar tissue. Further studies are needed to assess the impact of SRH-guided margin control on complete resection rates in BM surgery.

No conflict of interest.

ID229

Vergleich der präoperativen Bildqualität bei perihilären Cholangiokarzinomen: Photon-Counting-CT versus konventionelle CT-Technologie

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Perihiläre Cholangiokarzinome stellen die Diagnostik und operative Therapie vor große Herausforderungen. Sowohl die ERCP als auch die CT und MRT/MRCP bieten jeweils Vor- und Nachteile für die präoperative Planung. Das hochauflösende Photon-Counting Detector CT hat in ersten Studien eine verbesserte Darstellung von hepatozellulären Karzinomen gezeigt. Diese neue Technologie könnte durch eine höhere Bildqualität auch die Beurteilung der hilären Strukturen, des Tumors und dessen Ausdehnung verbessern. Ziele: Ziel dieser Studie ist der Vergleich der objektiven und subjektiven Bildqualität zwischen der Photon- Counting Detector CT (PCD-CT) und der Energy-Integrating Detector CT (EID-CT) bei Patienten mit perihilären Cholangiokarzinomen. Aus insgesamt 302 Patienten mit perihilären Cholangiokarzinomen der institutseigenen Datenbank (2008 – 2025) wurden für die vorliegende Studie bislang acht Patienten eingeschlossen, die eine abdominelle CT mit intravenösem Kontrastmittel sowohl mit PCD-CT als auch mit EID-CT erhielten. Es erfolgte somit ein strukturierter intraindividueller Vergleich zwischen PCD-CT und EID-CT. Die objektive Bildbeurteilung erfolgte durch die Bestimmung des Bildrauschens und des Kontrast-zu-Rausch-Verhältnisses (CNR) in zuvor definierten Bereichen (Leberparenchym, der Aorta, Muskel- und subkutanes Fettgewebe). Mittels einer 5-Punkte-Likert-Skala wurde von drei unabhängigen Prüfern (n = 2 Radiologie, n = 1 Viszeralchirurgie) eine subjektive Bildqualitätsanalyse durchgeführt, wobei die generelle Bildqualität, Bildrauschen, Bildschärfe, Beurteilbarkeit des Leberhilus und des Tumors beurteilt wurden. Die Ergebnisse wurden mit T-Tests und Wilcoxon Signed Rank Tests ausgewertet. Die Geschlechter innerhalb des Patientenkollektivs waren gleichmäßig verteilt (50% weiblich) und das Durchschnittsalter zum Zeitpunkt der CT Aufnahme betrug 64 ± 16 Jahre. Die mittlere Zeit zwischen den verschiedenen CT Modalitäten lag bei 37,5 Tagen (range: 3-280 Tage). Im intraindividuellen Vergleich zeigte sich ein vergleichbares Dosislängenprodukt (479,97 mGy*cm vs. 495,52 mGy*cm, p = 0,44). Im Vergleich zur EID-CT zeigte die PCD-CT in der arteriellen Phase ein signifikant höheres Signal-zu-Rausch-Verhältnis (SNR) und CNR (6,88 vs. 3,49, p = 0,02). Dies lässt sich auch in der venösen Phase für das CNR als Trend darstellen (12,46 vs.7,94, p = 0,05). Vor allem in der Beurteilung der generellen Bildqualität (4,33 [4-5] vs. 3 [3-3], p = 0,009), des Rauschens (4,5 [4-5] vs. 2,5 [2-3], p = 0,008) und der Bildschärfe (4 [4-5] vs. 3 [3-3], p = 0,009) erhielt die PCD-CT eine signifikant bessere Bewertung als das EID-CT. Es zeigte sich, dass die tendenziell etwas bessere mediane Beurteilbarkeit des Leberhilus (4 [4-4,75] vs. 3 [3-3], p = 0,15) und des Tumors (4 [3,25-4,75] vs. 3 [2-3,75], p = 0,123) in der PCD-CT keine statistische Signifikanz erreichte. Diese vorläufigen Ergebnisse der Datensätze deuten darauf hin, dass sowohl eine bessere subjektive als auch objektive Bildqualität bei der PCD-CT vorliegen könnte. Die Auswertung zeigt ein signifikant geringeres Rauschen im PCD-CT bei vergleichbaren Strahlendosen zum EID-CT. Die Abgrenzung von Hilusgefäßen und Tumor könnte dadurch erleichtert werden. Der klinische Einfluss der besseren objektiven Bildqualität sollte in größeren Kollektiven und prospektiv untersucht werden.

No conflict of interest.

ID230

Innovative Resektionsplanung in der Leberchirurgie: Anwendung von Deep-Learning-Methoden

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Patientenspezifische anatomische Variationen erfordern insbesondere bei komplexen Leberresektionen eine sorgfältige präoperative Planung. Neben der Berechnung des zukünftigen Leberrestvolumens (Future Liver Remnant, FLR) ist die Beurteilung potenziell gefährdeter vaskulärer und biliärer Strukturen entscheidend, um postoperative Morbidität und Mortalität möglichst gering zu halten. Trotz des Fortschritts moderner Technologien erfolgt die Resektionsplanung bislang überwiegend mental und wird nur in Einzelfällen durch volumetrische Berechnungen oder 3D-Modellen unterstützt. Ziel der vorliegenden Arbeit ist Entwicklung eines Geometrischen Deep Learning (DL)-gestützten Systems zur Resektionsplanung, das Chirurg:innen zusätzlich zur etablierten Planung ein objektivierbares Werkzeug für die Resektionsplanung an die Hand geben soll. Zwölf Fälle aus der innerklinischen Datenbank mit insgesamt 3.177 Fällen (2008–2023) wurden retrospektiv analysiert. Eingeschlossen wurden möglichst vielfältige Resektionsverfahren sowie sowohl primäre (hepatozelluläres Karzinom) als auch sekundäre (kolorektale Metastasen) Lebertumoren. Aus den präoperativen Bilddaten wurden mittels der semiautomatischen Rekonstruktionssoftware Synapse 3D dreidimensionale Modelle erstellt. Auf Basis von Operationsberichten und histologischen Angaben zu Größe und Gewicht der Resektate wurden die Resektionsvolumina eingezeichnet. Die daraus entstandenen 3D-Modelle im STL-Format (Standard Tessellation Language) dienten dem Training der Deep-Learning-Netzwerke, die im Gegensatz zur herkömmlichen bildbasierten Analyse Oberflächenmodelle und Punktwolken als Eingabedaten verarbeiten. Die Deep-Learning-Architektur RandLANet wurde durch Anpassung der Loss-Funktion – unter Verwendung von Kreuzentropie (Cross Entropy, CE), DICE-Koeffizient, Intersection over Union (IoU) sowie einer hybriden Kombination aus IoU und CE – sowie durch Integration von Attentive Pooling zur Vorhersage des Resektionsvolumens optimiert. Die resultierenden Vorhersagen wurden mittels Kennzahlen wie Genauigkeit, Präzision, Sensitivität, F1-Score und IoU-Score bewertet. Ergebnisse: Von den zwölf Datensätzen wurden neun für das Training, einer für die Validierung und zwei für das Testen des geometrischen Deep-Learning-Netzwerks verwendet. Die höchste Genauigkeit zeigte sich bei Verwendung der IoU-Loss-Funktion mit 0,968, gefolgt von der Hybrid-Funktion (0,963), DICE (0,960) und CE (0,957). Die besten Präzisionswerte erzielte CE (0,997), gefolgt von IoU (0,831), hybrid (0,653) und DICE (0,615). Hinsichtlich der Sensitivität lagen hybrid (0,720) und DICE (0,714) vor IoU (0,531) und CE (0,215). Der F1-Score wies ein ähnliches Muster auf: hybrid 0,685, DICE 0,661, IoU 0,648 und CE 0,354. Die Hybrid-Loss-Funktion ermöglichte somit die qualitativ beste Vorhersage der Resektionsvolumina. Die Ergebnisse stellen einen Zwischenstand der aktuellen Forschung dar. Das System muss noch mit einer größeren Fallzahl trainiert und validiert werden. Dennoch zeigt sich bereits, dass Deep-Learning-basierte Systeme eine präzise dreidimensionale Resektionsplanung unterstützen können. Unter der Zuhilfenahme von Geometrischen DL Ansätzen, kann dabei insbesondere die räumliche Anordnung und Ausdehnung der Strukturen in das Modell integriert werden. Perspektivisch könnte das System durch die Einbindung klinischer Parameter erweitert und für eine präoperative Risikostratifizierung in der Leberchirurgie eingesetzt werden.

No conflict of interest.

ID232

Artificial-intelligence-supported Raman spectromics for intraoperative label-free spinal tumor classification

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Surgical procedures involving spinal tumors demand immediate histopathological assessment to inform intraoperative surgical decision-making and immediate clinical treatment planning. Conventional diagnostic approaches suffer from prolonged processing times and dependency on specialized pathological expertise. This study aimed to develop and validate an artificial intelligence framework for immediate tumor classification during spinal surgery. We developed an automated diagnostic vision platform utilizing an intraoperative, portable stimulated Raman histology (SRH) imaging system, consuming unprocessed tissue specimen without the need for fixation and staining procedures. A deep learning framework based on convolutional and transformer architecture (AI) was implemented and trained specifically for spinal tissue analysis and to classify into four common tumor categories: meningioma, schwannoma, ependymoma, and metastasis. Testing was conducted on three international medical centers (New York University, University of Michigan, Medical University of Vienna) with final histopathological diagnosis serving as reference. The testing cohort comprised 142 SRH images across participating institutions. The AI system demonstrated a mean balanced diagnostic accuracy of 92.7% (CI95%: 89.8-95.3%), with diagnosis within a 5-minute timeframe. Individual tumor type classification accuracy ranged from 83.4% to 99.1%. Cross-institutional performance showed consistent results, varying between 89.3% and 93.0%.

Comparative analysis revealed superior performance compared to existing brain tumor classification algorithms, with an accuracy improvement of 15.7%. This investigation presents the first implementation of AI-driven near real-time spinal tumor diagnosis during surgical procedures. Our system demonstrates significant potential for clinical integration, that could enhance surgical decision-making and further treatment planning processes for spinal oncology procedures.

Conflict of interest:

D.A.O, T.C.H., and A.I-M. are shareholders in Invenio Imaging, Inc. A.I-M. is employed by Invenio Imaging Inc. M.S. is a scientific advisor and shareholder of Heidelberg Epignostix and Halo Dx, and a scientific advisor of Arima Genomics and InnoSIGN, and received research funding from Lilly USA, not related to this work. All other authors do not have any competing interests.

ID233

Determining the Influence of CAF-secreted factors on radiotherapy resistance in rectal cancer

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Radiation therapy remains a standard treatment for locally advanced rectal cancer, commonly followed by surgical resection. However, the response to neoadjuvant (chemo)-radiotherapy is heterogeneous. Therefore, it is key to further investigate the mechanisms leading to therapy resistance. Recent studies identified cancer-associated fibroblasts (CAFs), a key factor of the tumor microenvironment (TME), to mediate and maintain therapy resistance in various cancer entities. This study aimed to further elucidate the underlying cellular and molecular mechanisms, focusing in particular on the influence of CAF-secreted factors on radiotherapy resistance of rectal cancer cells. To reach this goal, patient-derived primary rectal cancer cell lines were incubated in different CAF conditioned media and subsequently exposed to radiotherapy. The growth behavior was then assessed via live-cell imaging (Incucyte®) over a period of ten days. Cellular viability was measured using CellTiter Glo® assay as endpoint read-out. We observed that CAF-conditioned media did not influence both cellular viability and radiotherapy response of primary rectal cancer cells. Further investigations will now focus on the question whether specific CAF secreted factors, which were previously identified by a secretome analysis, are able to influence the radiotherapy response.

No conflict of interest.

ID237

WATER III: Aquablation vs. transurethrale Laserenukleation bei Patienten mit LUTS und Prostatavolumen zwischen 80 und 180ml

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Einleitung

Es wurde bereits gezeigt, dass die Aquablation Therapie (AT) eine wirksame und sichere Behandlungsoption für Patienten mit benignem Prostatasyndrom (BPS) darstellt. Fünfjahresdaten im Vergleich zur transurethralen Resektion der Prostata (TURP) bei kleinen und mittleren Prostatagrößen liegen vor. Wir berichten nun erstmals über die Sicherheit und Wirksamkeit der AT versus der transurethralen Laserenukleation (HoLEP/ThuLEP) bei großem Prostatavolumen (80–180 ml).

Material und Methoden

Die internationale, prospektive, multizentrische Studie WATER III schloss randomisierte und nicht-randomisierte Patienten ein. Primärer Endpunkt war die Reduktion des International Prostate Symptom Scores (IPSS). Der primäre Sicherheitsendpunkt war die Rate von Clavien-Dindo (CD) ≥ Grad 2 oder persistierenden Grad 1 Adverse events (z. B. Ejakulationsstörungen, erektile Dysfunktion, Harninkontinenz). Die Ergebnisse wurden drei Monate nach der Operation erhoben.

Ergebnisse

Zwischen Dezember 2020 und September 2024 wurden 202 Männer eingeschlossen. In die finale Analyse gingen n=98 nach AT und n=88 nach HoLEP/ThuLEP ein. Nach drei Monaten reduzierte sich der IPSS um –12,9 Punkte (AT) bzw. –13,1 Punkte (HoLEP/ThuLEP; pBayesian <0,001). CD ≥2 oder persistierende Grad 1-AEs traten bei 38,8 % (AT) vs. 54,5 % (HoLEP/ThuLEP; pBayesian<0,05) auf. Die retrograde Ejakulation war bei AT seltener (14,8 % vs. 77,1 %; p<0,001). Eine Harninkontinenz nach drei Monaten wurde bei 8,7 % (AT) vs. 20 % (HoLEP/ThuLEP; p=0,069) beobachtet.

Schlussfolgerung

Die kurzfristige Symptomverbesserung und das Sicherheitsprofil von AT und HoLEP/ThuLEP sind ähnlich. AT ist mit einer höheren Rate des antegraden Ejakulationserhaltes verbunden (clinicaltrials.gov: NCT04801381).

No conflict of interest.

ID238

KI-Mikroultraschallprojekt

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Purpose Microultrasound might serve as a viable alternative to magnetic resonance imaging for initial prostate cancer dectetion. This study developed a deep learning model to detect clinically significant prostate cancer on microultrasound and evaluated its impact on diagnostic performance among novice readers.

Materials and Methods

One hundred microultrasound sweeps (fifty with clinically significant prostate cancer and fifty benign) were used to train a deep learning model. Model performance was assessed using the area under the receiver operating characteristics curve and Dice similarity coefficient. In an independent test set (twenty-five with clinically significant prostate cancer, twenty-five benign), five novice readers each evaluated two unique sets of ten sweeps before and after a structured microultrasound training. In both sessions, they first reviewed sweeps unaided and then with algorithm-generated heatmaps.

Results

On the training set, DeepTRUS achieved an area under the curve of 0.687 (95% confidence interval 0.583–0.791) and a Dice score of 0.30 (0.21–0.39). In the test set, reader area under the curve improved from 0.459 (0.294–0.624) to 0.556 (0.394–0.718) before training, and from 0.610 (0.452–0.767) to 0.782 (0.656–0.908) after training, with DeepTRUS assistance. Sensitivity increased from 60% to 72% pre-training and from 80% to 88% post-training. The interaction between training and DeepTRUS assistance was significant (P = 0.006); while training alone (P = 0.12) and DeepTRUS assistance alone (P = 0.08) were not.

Conclusions

The DeepTRUS model enhanced the diagnostic performance of novice readers, particularly when combined with structured microultrasound training.

No conflict of interest.

ID239

Therapie periprankreatischer viszeraler Aneurysmata bei Patienten mit begleitenden viszeralarteriellen Stenosen

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Purpose

To identify the frequency and association of visceral arterial (VA) stenosis in peripancreatic aneurysms (PPAs) and to develop a uniform, more detailed treatment strategy for PPAs in case of accompanying VA stenosis, as current guidelines do not adequately address this constellation.

Materials and methods

Patients with PPAs diagnosed at a tertiary care hospital were retrospectively analyzed. In case of multiple PPAs, the aneurysm with the highest aneurysm-to-vessel ratio (AVR) within the celiac-mesenteric collateral circulation was classified as the primary aneurysm and categorized as “critical” or “non-critical” based on the risk of organ ischemia.

Celiac artery and superior mesenteric artery stenoses were graded as low (<50%), high (>50%), or total occlusion. Treatment strategies were based on VA stenosis severity, aneurysm classification, and morphology. Treatment strategies included endovascular, surgical and watch-and-wait management.

Results

Thirty-one patients with PPAs were included with a total of 53 aneurysms; mean aneurysm size: 12.5±7.9 mm (range 5-38 mm), AVR: 3.5±2.1 (range 1-11.3). The superior and inferior pancreaticoduodenal arteries as well as the pancreaticoduodenal arcade were affected in most cases (67.9%). AVR was significantly higher in cases of aneurysm rupture (6.2±2.8; $p = 0.031$). Celiac artery stenosis was present in 87.1%.

Aneurysm size and occurrence of active bleeding did not correlate ($p = 0.925$). 11 patients presented with critical aneurysms, with 10 patients requiring individually tailored treatment. Non-critical aneurysms were treated with coil embolization in most cases.

Conclusion

CA stenosis, aneurysm position, and AVR significantly influence treatment decisions. Individualized approaches based on anatomical and hemodynamic factors are needed in PPA treatment.

No conflict of interest.

ID241

CT-Based preoperative planning before minimally invasive heart surgery: enhancing safety and precision through digital simulation

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Background: Minimally invasive cardiac surgery presents unique challenges due to limited surgical access and the inability to perform traditional intraoperative sizing. To address these limitations, we implemented a comprehensive CT-based preoperative planning protocol integrating anatomical risk assessment, advanced imaging, and digital prosthesis simulation.

Methods: Electrocardiogram-gated, contrast-enhanced computed tomography (CT) was used for preoperative evaluation in patients undergoing endoscopic valve surgery, as well as adjunctive left atrial appendage (LAA) clip ligation. Using specialized software (3mensio, 3mensio Medical Imaging B.V., Utrecht, Netherlands). We assessed circumflex artery (CX) proximity to the mitral annulus to predict potential injury. A CX Prediction Index (CXPI) was developed for stratifying risk. Additionally, digital STL models of surgical prostheses and LAA clips were created and virtually positioned to simulate device fit and procedural feasibility.

Results: CT-based analysis allowed detailed evaluation of cardiac anatomy, including annular dimensions, CX proximity, and left ventricular outflow tract morphology. Close CX–annulus distance and a low CXPI were associated with increased risk of iatrogenic injury during mitral valve surgery. In aortic valve procedures and LAA clip ligation, digital phantom simulation enabled optimal prosthesis selection and sizing in scenarios where direct intraoperative sizing is aggravated. This method also provided valuable insight into coronary ostia location and aortic root anatomy.

Conclusion: CT-based planning with digital simulation improves safety, precision, and procedural confidence in minimally invasive heart surgery. It enables accurate risk stratification and device sizing in scenarios where intraoperative visualization is limited. Routine integration of this approach is recommended to support surgical decision-making and reduce perioperative complications.

No conflict of interest.

ID242

Diagnostik und Therapie periprothetischer Pilzinfektionen – eine interdisziplinäre Herausforderung

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Periprothetische Pilzinfektionen (fungal periprosthetic joint infection, fPJI) stellen eine seltene, jedoch schwerwiegende und prognostisch ungünstige Komplikation in der Endoprothetik dar. In der überwiegenden Mehrzahl treten sie sekundär im Rahmen chronischer bakterieller Infektionen auf, insbesondere nach multiplen Revisionseingriffen und prolongierter antibiotischer Therapie. Primäre Pilzinfektionen sind eine Rarität. Die klinische Relevanz ergibt sich aus der oft verzögerten Diagnosestellung, der limitierten Evidenzlage bezüglich optimaler Therapiealgorithmen sowie den insgesamt niedrigen Sanierungsraten und dem daraus resultierenden eingeschränkten funktionellen Outcome.

Im Vortrag werden die verfügbaren diagnostischen Verfahren zur Erkennung einer fPJI hinsichtlich ihrer klinischen Relevanz bewertet. Neben klinischen Hinweisen und laborchemischen Untersuchungen stehen insbesondere die Gelenkpunktion mit Zellzahlanalytik, mikrobiologische Gewebeuntersuchungen sowie die histopathologische Befundung im Fokus. Die aktuellen Empfehlungen aus der Literatur werden kritisch mit den Daten einer prospektiv geführten fPJI-Datenbank (>100 Fälle) am BG Universitätsklinikum Bergmannsheil verglichen.

Therapeutisch erfordert die fPJI ein individualisiertes, stadiengerechtes Vorgehen im Rahmen eines multidisziplinären Behandlungskonzepts. Das therapeutische Spektrum reicht von Debridement, Antibiotics and Implant Retention (DAIR) bei sehr selektionierten Frühinfektionen bis hin zu meist mehrzeitigen Wechseloperationen in Kombination mit einer gezielten systemischen Antimykotikatherapie. Vorläufige Ergebnisse unserer Datenbankanalyse zeigen Sanierungsraten von bis zu 89 % im Rahmen eines dreizeitigen Behandlungsalgorithmus.

Die Behandlung von fPJI bleibt komplex. Ziel des Vortrags ist es, praxisrelevante Empfehlungen zur Diagnostik und Therapie der fPJI zu vermitteln und das Bewusstsein für diese seltene, aber gravierende Komplikation in der endoprothetischen Infektbehandlung zu schärfen.

No conflict of interest.

ID243

Analyse der antimykotischen Wirkung von Platin-Silber-Nanopatch-Oberflächen auf Basis eines Opferanodensystems

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Due to the increasing resistance to antibiotics and antimycotics, particularly relevant in the treatment of implant-associated infections, research is increasingly focusing on antimicrobial metals such as nanosilver.
In this work, an anti-infective bimetallic sacrificial anode coating that combines nanosilver with nanoplatinum and whose efficacy against bacteria has already been demonstrated in preliminary work was examined for its efficacy against Candida albicans.
A nanostructured platinum-silver coating (platinum-silver nanopatches) was produced on silicon wafers using magnetron sputtering. The amount of deposited metal, and thus the size of the nanopatches, was varied by the sputtering time. Electron microscopic imaging was used to demonstrate standardized production of the native surfaces.
To analyze the antifungal effect, the coated test specimens were colonized with different germ densities of the fungus Candida albicans (C. albicans). Nanocoatings made of pure silver or platinum and the germs Staphylococcus aureus (S. aureus) and Escherichia coli (E. coli) were examined as control groups. The morphology and metabolic activity of the microorganisms at different times of incubation on the test specimens were examined using live-death staining and AlamarBlue assay. The efficacy of silver ions was monitored using silver acetate solutions of different concentrations by determining the minimum inhibitory concentration and the minimum fungicidal concentration.
A reduction in both adherent and planktonic bacteria on the sacrificial anode coating was observed for both types of bacteria tested. In contrast, the investigation of the antimycotic effect did not reveal any significant microbial reduction regardless of the microbial exposure and the coating. There was also no significant reduction in the metabolic activity of C. albicans on any of the test specimens, regardless of the applied germ count. The electron micrographs showed increased hyphal formation on the sacrificial anode system.
The control test using silver acetate showed a value for the minimum inhibitory concentration (MIC) that was dependent on the bacterial density (colony forming units (CFU/ml)): 102CFU/ml: MIC = 50-100 µg/ml Ag+; 103CFU/ml: MIC ≥ 100 µg/ml Ag+; 104CFU/ml: MIC > 100 µg/ml Ag+. However, the maximum tested silver ion concentration of 100 µg/ml was not sufficient for a fungicidal effect even at low germ density.
The platinum-silver sacrificial anode system tested is effective against bacteria in the trials, which is consistent with previous research results. However, significant efficacy against C. albicans could not be demonstrated. The metabolic activity of this fungus is not significantly affected. The MIC determined is largely in line with previous studies in the literature. However, the silver content of the test specimens (in the ng range) is lower than the MIC determined for C. albicans. Even a rapid and short release of silver ions by the sacrificial anode system could not induce a significant antimycotic effect in the experiments. Moreover, the silver concentration, which is too low for C. albicans, promotes biofilm formation due to its characteristic dimorphism. Thus, unlike in the case of S. aureus and E. coli, the investigated system as a nanosurface with silver is not suitable as a prosthetic coating for primary infection prophylaxis against C. albicans.
No conflict of interest.

ID244

Antitumoraler Effekt von Nicht-invasivem physikalischem Plasma bei der Behandlung oraler Plattenepithelkarzinom-Resektate ex vivo

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Die häufig späte Diagnosestellung des oralen Plattenepithelkarzinoms bedingt oftmals invasive Therapieansätze mit begrenztem Behandlungserfolg. Aufgrund seiner selektiven zytotoxischen Wirkung auf Tumorzellen wird nicht-invasives physikalisches Plasma (NIPP) als vielversprechende Option für eine adjuvante Tumortherapie diskutiert. Ziel dieser Studie war es, die Effekte von NIPP auf die Zellproliferation und Apoptose in ex vivo gewonnenem Gewebe oraler Plattenepithelkarzinome zu untersuchen, um potenzielle Anwendungsmöglichkeiten im klinischen Kontext zu evaluieren. Es wurden insgesamt 59 Gewebeproben von 19 Patienten mit intraoralem Plattenepithelkarzinom ex vivo mit NIPP behandelt. Die Applikationszeiten betrugen 30, 60, 180 und 300 Sekunden. Während der Behandlung wurde die Gewebetemperatur mittels Infrarotkamera kontinuierlich überwacht. Nach einer Inkubationszeit von 24 Stunden erfolgte die immunhistochemische Analyse hinsichtlich Proliferation (Ki67) und Apoptose (TUNEL-Assay). Die Signalintensitäten wurden quantifiziert und mithilfe von ANOVA und dem Tukey-Test statistisch ausgewertet. Die Behandlung mit NIPP führte zu einer signifikanten Hemmung der Zellproliferation sowie zu einer verstärkten Apoptoseinduktion. Beide Effekte zeigten eine zeitabhängige Zunahme. Die maximale Temperatur am Kontaktpunkt des Plasmas lag bei 30,9 °C nach 300 Sekunden Behandlungsdauer. Alles in allem zeigen die Ergebnisse, dass NIPP ex vivo antitumorale Effekte auf Gewebe oraler Plattenepithelkarzinome ausübt und somit einen vielversprechenden Ansatz für zukünftige therapeutische Anwendungen darstellen könnte.

No conflict of interest.

ID246

Stimulation wundheilungsrelevanter Faktoren in humanen Gingivafibroblasten durch Nicht-invasives physikalisches Plasma (NIPP) in vitro"

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In den vergangenen Jahren konnte gezeigt werden, dass Nicht-invasives medizinisches Plasma (NIPP) die Wundheilung positiv beeinflussen kann – ein potenzieller Vorteil insbesondere für Patienten mit gestörter Wundheilung. Trotz vielversprechender Ergebnisse in anderen Bereichen der Medizin findet die Anwendung von NIPP in der Mund-, Kiefer-, und Gesichtschirurgie bislang nur in begrenztem Umfang statt. Ziel dieser Studie war es, die Auswirkungen eines für den oralen Einsatz zugelassenen NIPP-Geräts auf die Zellviabilität und Genexpression primärer humaner Gingivafibroblasten zu untersuchen. Nach erfolgreicher Isolation und Charakterisierung wurden primäre humane Gingivafibroblasten sowohl direkt als auch indirekt mit NIPP (Plasma One, Plasma Medical Systems, Nassau) behandelt. Bei der direkten Applikation erfolgte die Plasmaexposition auf die Zellen des Kulturmediums, während bei der indirekten Variante das Medium zunächst ohne Zellen behandelt und anschließend zu unbehandelten Zellen gegeben wurde. In beiden Versuchsansätzen wurde die Expression wundheilungsrelevanter Gene (Ki67, PCNA, Col1, MMP1, COX2) auf mRNA-Ebene mittels quantitativer Real-Time-PCR sowie auf Proteinebene mithilfe von ELISA untersucht. Die NIPP-Exposition führte zu einem signifikanten Anstieg der Expression von Markern, die mit der Zellproliferation assoziiert sind. Die Ergebnisse legen nahe, dass das durch das eingesetzte NIPP-Gerät erzeugte Plasma einen stimulierenden Einfluss auf die Proliferation von Gingivafibroblasten ausübt. Dies unterstreicht das potenzielle therapeutische Anwendungsspektrum von NIPP als unterstützende Maßnahme bei der Behandlung intraoraler Wundheilungsstörungen.

No conflict of interest.

ID247

LiBOD™ – Sepsis: A Prospective Military-Civilian Initiative for Early Sepsis Detection Using Small Extracellular Vesicles – a project outline

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Sepsis remains a leading cause of mortality in emergency medicine, with early detection critical yet frequently delayed. The LiBOD™ (Liquid Biopsy in Organ Damage) – Sepsis initiative, anchored at German Armed Forces Central Hospital, Koblenz, Department of General, Visceral and Thoracic Surgery (Clinic 2), aims to establish an AI-assisted diagnostic framework using small extracellular vesicle (small EV) profiling and routine clinical parameters to enable early sepsis recognition. As a clinical model for sepsis, this study includes patients with clinically confirmed secondary peritonitis, both with and without manifest sepsis. Secondary peritonitis resulting from hollow organ injury—such as intestinal perforation—serves as a clinically relevant surrogate for abdominal sepsis and constitutes one of the primary triggers of bacterial sepsis in both civilian and military settings. Longitudinal sampling is performed across six timepoints (Day 0, 1, 3, 7, 10, 14), enabling temporal resolution of biomarker dynamics. We aim to investigate markers such as $CD9^+CD14^+$, $CD9^+CD61^+$, and $CD9^+CD235a^+$—previously described in inflammatory and trauma-related contexts—and others depending on our omics results. These will form the foundation of a refined EV biomarker panel suitable for early clinical application. The German Armed Forces Central Hospital Koblenz leads both scientific design and analytical development, with direct relevance for future deployment scenarios. AI-driven models such as random forest classifiers will be trained to identify diagnostic patterns based on sEV marker profiles and clinical parameters. Model performance will be assessed using 10-fold cross-validation to ensure robustness and reduce overfitting. Feature importance and model interpretability will be evaluated using SHAP (SHapley Additive exPlanations) to gain transparent insights into the contribution of individual biomarkers. The resulting models will not only quantify diagnostic accuracy (e.g., sensitivity, specificity, ROC-AUC), but also inform clinical decision-making pathways. To ensure generalisability beyond the training cohort, a separate external validation cohort is planned for downstream model testing without retraining. Conclusion: LiBOD™ – Sepsis stands as a translational flagship bridging Bundeswehr medical priorities with civilian critical care, enabling real-time, resource-efficient diagnostics for improved sepsis risk stratification and outcomes in high-stakes settings.

No conflict of interest.

ID248

Core2Edge: a human glioblastoma organoid and brain slice co-culture model capturing tumor infiltration and transcripitonal heterogeneity from core to single-cell dispersion

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Introduction

Glioblastomas function as intricate cellular networks that extend into the surrounding brain tissue enabling long distance communication. This malignant connectivity spans from the tumor core to remote infiltration zones, supporting the concept of glioblastoma as a whole-brain disease. With growing ethical considerations in biomedical research and the limitations inherent in cross-species comparisons between animal studies and human glioblastoma models, human tumor platforms remain constrained in their ability to replicate the full infiltration spectrum from the tumor core to single-cell dispersion. Here, we present a three-dimensional, fully human ex-vivo glioblastoma model („Core2Edge") that replicates this extensive infiltration range while preserving the intratumoral heterogeneity of the original tumor. This model involves implanting fluorescently labeled human glioblastoma organoids (GBOs) into organotypic human brain slices, maintaining the genetic integrity and cytoarchitecture of both brain and tumor.

Materials and Methods

The Core2Edge model involves a comprehensive workflow completed over 7–12 days. Key steps include brain slice preparation (~4-6 hours, depending on quantity), one day for initial culture before GBO staining and transplantation, a variable culture period (up to ten days), and fixation with different techniques (~8 hours). Following model preparation, downstream analyses such as imaging, sequencing, and proteomics were performed.

Results

Multiplex immunofluorescence confirmed cell composition consistent with histological staining. Spatial transcriptomics enabled detailed glioblastoma cell subtyping based on Neftel states. Advanced imaging, combining tissue expansion and light-sheet fluorescence microscopy, facilitated super-resolution, three-dimensional visualization of the GBO-brain slice system. This approach allows for the study of initial infiltration steps, in-depth analysis of the invasive front, exploration of cell-cell interactions between tumor cells and the tumor microenvironment, and offers a platform for drug screening and testing, reducing the need for animal models.

Conclusions

The „Core2Edge" model represents an innovative ex-vivo platform replicating glioblastoma infiltration and heterogeneity. By preserving genetic integrity and cytoarchitecture, this fully human model bridges critical gaps in glioblastoma research, offering unparalleled insights into tumor behavior and potential therapeutic interventions.

No conflict of interest.