1 Colorectal surgery

Quality of life after laparoscopic peritoneal lavage for Hinchey III diverticulitis – preliminary results of a regional cross-sectional study

J.H. Secher[1], H.R. Dalby[1,2], R. Erichsen[1,2], K.J. Emmertsen[1]
[1]Regional Hospital Randers, Department of Surgery, Randers, Denmark, [2]Aarhus University Hospital, Department of Clinical Epidemiology, Aarhus N, Denmark

Background: Laparoscopic peritoneal lavage (LPL) has been the standard treatment for Hinchey III acute diverticulitis (AD) in Denmark according to national guidelines from 2012. Internationally, it is still debated whether LPL or acute resection is the best treatment for Hinchey III AD. Hence, the quality of life (QoL) in patients treated with LPL for Hinchey III AD is essential when determining the treatment strategy.
The aim of this study was to investigate long-term QoL after LPL for AD.
Method: All patients undergoing LPL for AD in Central Denmark Region from 2010-2021 were identified through the Business Intelligence Data Warehouse and were invited to answer a comprehensive online questionnaire. Patients with dementia or previous colorectal cancer and patients who had colonic resection before LPL were excluded.
The questionnaire included baseline characteristics and QoL. Generic QoL was evaluated by EuroQol Visual Analogue Scale (VAS) (1-100 with 100 being the best), and disease-specific QoL was evaluated by the diverticulitis quality of life instrument (DV-QoL) (0-10 with 0 being the best). QoL was reported as median scores with interquartile ranges (IQR).
Results: We identified 437 patients who had undergone LPL for AD and did not meet the exclusion criteria. Of these, 250 completed the questionnaire and were included in the analysis. In total, 123 (49%) were female. At the time of questionnaire completion, median age was 62 (IQR 53-70) and median time since LPL was 5.74 years (IQR 3.22-8.56).
The EQ VAS score after LPL for AD was 80 (IQR 59-90) and was lower among females (73, IQR 46-85) compared to males (82, IQR 73-90). The EQ VAS score for females was lower than the Danish general population mean of 82.4.
The overall DV-QOL score was 2.5 (IQR: 1.8-3.8) and 36% of patients scored above the patient acceptable symptom state (PASS) score of 3.2, indicating an unacceptable disease-specific QoL. Overall DV-QOL score was worse among women (3.0, IQR 1.9-4.1) compared to men (2.1, IQR 1.8-3.2) with 46% of women compared to 27% of men reporting unacceptable QoL.
Conclusion: Long-term QoL is impaired in a considerable proportion of patients that have undergone LPL for AD. Generic and disease-specific QoL were worse among women compared to men.
Based on patients' questionnaires, we will further investigate self-reported health status and QoL after LPL for AD.

The Kinetics of Cytokine and Matrix-metalloproteinase Levels in Peritoneal Fluid: Understanding Anastomotic Leak Development in Rectal Cancer Patients via Intraperitoneal Microdialysis (KRISIS)

S. Khalaf[1], I. Al-Najami[1], K. Lambertsen[2], H. Bjarke Rahr[3], S. Möller[4], N. Qvist[1], M. Ellebæk[1]
[1]Odense University Hospital, Deparment of Surgery, Odense, Denmark, [2]University of Southern Denmark, Department of Neurobiology Research, Institute of Molecular Medicine, Odense, Denmark, [3]Vejle Hospital - University Hospital of Southern Denmark, Department of Surgery - Colorectal Cancer Center South, Vejle, Denmark, [4]University of Southern Denmark, OPEN, Odense, Denmark

Background: Anastomotic leakage (AL) poses a significant risk to patients undergoing low anterior resection (LAR) for rectal cancer (RC), often leading to severe complications. Timely detection of AL is crucial for patient outcomes, yet current diagnostic methods often result in delayed identification, with the average time of diagnosis being between 8-12 days postoperatively, and up to 61% of cases classified as ISREC grade-C.
This study aimed to assess the efficacy of microdialysis (MD) in measuring intraperitoneal cytokine and matrix-metalloproteinase (MMP) concentrations as a novel approach for both early detection and mechanistic understanding of AL following LAR.
Method: In a two-center, prospective cohort study, 121 patients undergoing LAR for RC were enrolled from September 2010 to March 2016. An MD catheter was intraoperatively positioned near the anastomosis, enabling continuous intraperitoneal fluid sampling over 3 days. Samples were analyzed every 8 hours for IL-6, IL-1β, IL-10, TNF-α, and MMP-9 concentrations using electrochemiluminescence immunoassays. A total of 3072 samples were analyzed with 81 being excluded due to various reasons. AL was confirmed by CT, endoscopic, or surgical means.
Results: The overall AL rate was 29% (ISREC grade A, *n* = 11; grade B, *n* = 12; grade C, *n* = 12). Intraperitoneal concentrations of IL-1β and TNF-α were significantly elevated in the AL group 8 hours postoperatively (p = 0.001; p = 0.001) compared to the non-AL group. IL-10, IL-6, and MMP-9 were all found significantly elevated at 16 hours postoperatively (p = 0.001; p = 0.001; p = <0.013).
Conclusion: Elevated levels of cytokines and matrix-metalloproteinases detected through intraperitoneal microdialysis are strongly associated with anastomotic leakage, with significant increases in IL-1β and TNF-α levels, observable as early as 8

hours postoperatively. Intraperitoneal microdialysis shows great promise for the early detection of anastomotic leakage after low anterior resection for rectal cancer.

AI-Driven Risk Assessment and Personalized Treatment Pathways in Perioperative Care

I. Ose[1], A. Rosen[1], L.P. Kloster Andersen[2], M. Gögenur[1], R. Dahlin Bojesen[1], R. Peuliche Vogelsang[1], M. Høyer Rose[1], P. Wallentin Steenfos[1], S. Eraslan[1], E. Gögenur[1], C. Alexandersen[1], A.A. Righult[1], E.C. Ayhan[1], A. Thomsen Nielsen[1], I. Kolukisa Saqi[1], A. Fogh Juvik[1], T. Fransgård[1], M. Holt Thomsen[1], M. Seiersen[1], S. Brisling[1], S. Ydegaard Turiño[1], N. Abild Frederisken[1], J. Ravn Eriksen[1], I. Gögenur[1]
[1]Center for Surgical Science, Zealand University Hospital, Department of Surgery, Koege, Denmark, [2]Zealand University Hospital, Department of Anesthesiology, Koege, Denmark

Background: Postoperative morbidity and mortality rank as the third leading cause of death worldwide. Postoperative morbidity has a negative impact on long-term survival after colorectal cancer surgery (CRC). Identifying high-risk patients for adverse outcomes remains a significant challenge in clinical practice. Studies on perioperative prehabilitation have demonstrated improved clinical outcomes. However, targeted interventions for high-risk patients may further enhance postoperative outcomes. In this study, we implemented AI-based individual risk assessments and targeted interventions within prehabilitation and perioperative optimization. We aimed to reduce the incidence proportion of complicated postoperative course after CRC surgery.
Method: In February 2023, a decision support tool for multidisciplinary team conferences planning elective curative-intended CRC surgery was implemented at Zealand University Hospital. The tool predicted the risk of 1-year mortality risk of patients after surgery and made suggestions for risk stratification into four groups based on the predicted risk: A (≤1%), B (>1-≤5%), C (>5-≤15%), and D (>15%). Individualized treatment pathways were developed for each risk group based on existing evidence within perioperative optimization. A treatment group of patients treated with the new paradigm was compared to a historical control group treated between 2020 and 2022. The incidence of patients having a complicated postoperative trajectory was defined as a Comprehensive Complication Index (CCI) > 20, and the incidence of any medical complication was recorded on postoperative day 90. Univariate logistic regressions and multivariate models were used to investigate the association between the exposure status and the outcomes.
Results: Between February 2023 and December 2023, 194 patients were included in the treatment group, while 806 historical cases were identified between 2020-2022. The incidence of the CCI > 20 was 19.1% in the treatment group versus 28.0% in the control group, adjusted OR of 0.63 (95% CI: 0.42-0.92, p=0.02). The incidence of any medical complication was 23.7% in the treatment group and 37.3% in the control group, OR of 0.53 (95% CI: 0.36-0.76, p<0.001).
Conclusion: Targeted interventions within perioperative optimization reduced the incidence of complicated postoperative course. Furthermore, our study supports artificial intelligence clinical usability for decision support in the healthcare sector.

The Association of Mismatch Repair Status with Microscopically Positive (R1) Margins in Stage III Colorectal Cancer: A Retrospective Cohort Study

H. Smith[1], N. Schlesinger[1], D. Chiranth[2], C. Qvortrup[3]
[1]Copenhagen University Hospital - Bispebjerg and Frederiksberg, Abdominalcenter K, København, Denmark, [2]Copenhagen University Hospital - Rigshospital, Department of Pathology, København, Denmark, [3]Copenhagen University Hospital - Rigshospital, Department of Oncology, København, Denmark

Background: There is mounting evidence that microscopically positive (R1) margins in patients with colorectal cancer may represent a surrogate for aggressive cancer biology rather than technical failure during surgery. However, whether detectable biological differences exist between colorectal cancer with R0 and R1 margins is unknown. We sought to investigate whether mismatch repair (MMR) status differs between Stage III colorectal cancer with R0 or R1 margins.
Method: Patients treated for Stage III colorectal cancer from January 1, 2016 to December 31, 2019 were identified by using the Danish Colorectal Cancer Group database. Patients were stratified according to MMR status (proficient [pMMR] vs. deficient [dMMR]) and margin status. Outcomes of interest included the R1 rate according to MMR and overall survival.
Results: A total of 3636 patients were included, of whom 473 (13.0%) had dMMR colorectal cancers. Patients with dMMR cancers were more likely to be elderly, female, and have right-sided cancers. R1 margins were significantly more common in patients with dMMR cancers (20.5% vs. 15.2%, $p < 0.001$), with the greatest difference seen in the rate of R1 margins related to the primary tumour (8.9% vs. 4.7%) rather than to lymph node metastases (11.6% vs. 10.5%). This association was seen in both right- and left-sided colon cancers. On multivariable analyses, R1 margins, but not MMR status, were associated with poorer survival, alongside age, pN stage, perineural invasion, and extramural venous invasion.
Conclusion: In patients with Stage III colorectal cancer, dMMR status is associated with increased risks of R1 margins following potentially curative surgery, supporting the use of neoadjuvant immunotherapy in this patient group.

Temporal Trends in Incidence and Mortality of Colorectal Cancer in Denmark from 2007 to 2022

I. Ravnsbæk Johannsen[1], A. Kindberg Boysen[2], F. Viborg Mortensen[1], J. Kirkegård[1]
[1]Aarhus Universitetshospital, Mave- og Tarmkirurgisk Afdeling, Aarhus N, Denmark, [2]Aarhus Universitetshospital, Kræftafdelingen, Aarhus N, Denmark

Background: Colorectal cancer (CRC) is the third most common cancer in the Western world and represents a significant burden on healthcare systems worldwide. We aimed to describe temporal trends in incidence, tumour characteristics, and survival for patients with CRC in a nationwide, population-based cohort in Denmark.
Method: We used population-based Danish healthcare registries to study all patients diagnosed with CRC from 2007-2022. We present age-standardized incidence rates (ASIR) as new cases per 100,000 population standardized to the European standard population. Survival analyses were performed using the Kaplan-Meier estimator.
Results: 77,277 people in Denmark were diagnosed with CRC from 2007 to 2022. ASIRs were relatively stable from 2007 to 2013 with an ASIR of 66 per 100,000 for colon cancer and 32 per 100,000 for rectal cancer. In 2014, an increase in incidence was observed (80.0 per 100,000 for colon cancer and 37.4 per 100,000 for rectal cancer), followed by a decline in later years. Median survival times were 4.1 (IQR: 0.8 to 14.1) years for patients diagnosed between 2007 to 2010, 5.3 (IQR: 1.1 to NA) years for patients diagnosed from 2011 to 2013 and 7.6 (IQR: 1.7 to NA) years for patients diagnosed from 2014 to 2017. The assessment of mutational and molecular profiles increased consistently throughout the study period.
Conclusion: We observed an initial increase in CRC incidence in 2014, corresponding with implementation of the national screening programme, followed by a subsequent decline. In recent years, the incidence has dropped below pre-screening levels. Additionally, survival rates have steadily improved, and the increasing use of molecular and mutational profiling reflects the growing complexity and multidisciplinary nature of CRC management.

Four-year Recurrence and Postoperative Complications after Laparoscopic Complete Mesocolic Excision– a Population-Based Study

T. Haug[1,2], J.B. Valentin[3], M.-B.W. Ørntoft[1,4], L.H. Iversen[5,2], S.P. Johnsen[3], R. Kennedy[6], D. Miskovic[6], A.H. Madsen[1]
[1]Gødstrup Hospital, Department of Surgery, Herning, Denmark, [2]Aarhus University, Department of Clinical Medicine, Aarhus N, Denmark, [3]Danish Center for Health Services Research, Department of Clinical Medicine, Aalborg, Denmark, [4]Aarhus Univeristy, Department of Clinical Medicine, Aarhus N, Denmark, [5]Aarhus University Hospital, Department of Surgery, Aarhus, Denmark, [6]St Mark's Hospital, Department of Surgery, Harrow, United Kingdom

Background: The oncological benefits of Laparoscopic Complete Mesocolic Excision (LCME) over conventional surgery is often challenged by single-centre designs, small cohorts, or limited follow-up. This study aimed to examine the difference in recurrence risk 4 years after surgery and 30-day postoperative complications before and after a population-based, multicentre LCME implementation.
Method: LCME was implemented in the Central Denmark Region, Denmark following a training programme in 2017 for all colon cancer surgeons. Colon cancer patients from before (2015-2016, PRE-group) and after the implementation (2018-2019, POST-group) were identified through the Danish Colorectal Cancer Group (DCCG) Database. Recurrence 4 years after surgery was ascertained through national registers using a validated algorithm. The Aahlen-Johansen estimator for competing risk was used to calculate cumulative incidence estimates of recurrence.
Results: A total of 1919 patients (PRE, n=1024; POST, n=895) underwent curative-intended surgery in the study period. The 4-year cumulative incidence of recurrence in the PRE group was 15.1% (95%CI: 12.9;17.2) and 13.0% (95%CI: 10.6;15.4) in the POST group, with an absolute risk reduction of 2.1% (95%CI: -1.1;5.2). Significantly lower risk of recurrence was observed in stage II cancer patients after the LCME implementation (HR 0.39(95%Cl 0.23;0.67)). Risk of severe postoperative complications was also significantly lower in the POST, compared to the PRE group.
Conclusion: LCME implementation was associated with a significantly lower risk of recurrence in stage II cancer patients and lower rate of severe postoperative complications in the entire group. This study indicates that multicentre LCME implementation may improve clinical outcomes without compromising patient safety.

Prognosis after emergency surgery for acute complicated diverticulitis

T.S. Laursen[1], H.R. Dalby[1,2], R. Erichsen[1,2], K.J. Emmertsen[1]
[1]Randers Regional Hospital, Surgical Department, Randers, Denmark, [2]Aarhus University Hospital, Department of Clinical Epidemiology, Aarhus C, Denmark

Background: The incidence of acute complicated diverticulitis is increasing. We lack knowledge of the risk of complications during and after emergency surgery as well as the risk of and risk factors for permanent stoma after emergency surgery. This investigates the risk of and risk factors for permanent stoma after emergency resection due to acute complicated diverticulitis.
Method: Using the BI-portal we identified patients from Randers Regional Hospital, who were admitted and underwent emergency surgery due to acute diverticulitis, from January 2019 to August 2023. Medical files were systematically reviewed and data was registered in RedCap. Patient characteristics such as sex, age, BMI, smoking status, American Society

of Anesthesiologists (ASA) physical status, comorbidities, known diverticular disease, previous abdominal surgery, and characteristics of the performed surgery including approach and complications were investigated as possible risk factors for permanent stoma after emergency surgery. Descriptive statistics were complied, and the patients with permanent stoma were compared to the patients with stoma reversal using Fisher's exact test and Welch's test.
Results: A total of 70 patients were included of whom, 36 (51%) had laparoscopic surgery and 34 (49%) underwent open surgery. A total of 42 (88% of resected patients) underwent emergency sigmoid resection with colostomy formation (Hartmann's procedure). Out of the patients with ostomy formation at the emergency surgery, 14 (29%) had elective stoma reversal and 27 (56%) ended with permanent stoma. Patients with permanent stoma were older and had a higher ASA status than patients with stoma reversal. Patient with permanent stomas and those who underwent stoma reversal were compatible in terms of the other characteristics studied.
Conclusion: The majority of patients undergoing emergency surgery for acute complicated diverticulitis had colostomy formation and 56% of patients with emergency resection ended with permanent stoma within the study period. Patients with permanent stoma were older and had higher ASA-status. A larger population is needed to further investigate risk factors for permanent stoma after emergency stoma formation.

Validity of the fecal microbiomes from colorectal cancer screening samples

A.B. Jørgensen[1], L. Almer[2], A. Alfaro-Núñez[3], E.A. Jensen[3], L. Friis-Hansen[4], B. Brandstrup[1]
[1]Holbæk Hospital, Department of Surgery, Holbæk, Denmark, [2]Bispebjerg Hospital, Center for Translational Research, Copenhagen, Denmark, [3]Næstved Hospital, Department of Clinical Biochemistry, The Colorectal Screening Secretariate, Næstved, Denmark, [4]Bispebjerg Hospital, Department of Clinical Biochemistry, Copenhagen, Denmark

Background: Fecal immunochemical test (FIT) sampling tubes, commonly used in colorectal cancer screening, have proven effective for large-scale gut microbiome analysis. Recent advancements, particularly full-length 16S ribosomal gene sequencing, have enhanced microbiome profiling precision. Non-invasive sampling methods like FIT and rectal swabs are key to patient participation in such studies. However, it remains uncertain how well the fecal and rectal microbiomes represent the mucosal microbiomes in different parts of the colon.
This study focused on two objectives: 1) investigating the impact of pre-analytical handling on fecal microbiome stability using FIT tubes, and 2) evaluating the representativeness of fecal and rectal microbiomes compared to mucosal microbiomes of the colon.
Method: In the first substudy, healthy adults provided stool samples to evaluate microbiome stability under various pre-analytical conditions. Bacterial DNA was extracted from FIT tubes, and samples were analyzed under various conditions: differences in sampling site, short-term storage at +20°C, long-term storage at -18°C or -80°C, and impact of the transport medium.
The second substudy included participants from the Danish Colorectal Cancer Screening Program who were referred for colonoscopies. Mucosal brush biopsies were collected from seven locations along the terminal ileum, colon, and rectum, along with fecal samples and rectal swabs.
All samples' full-length bacterial 16S rRNA genes were sequenced using Oxford Nanopore Technologies.
Results: In the first substudy (N = 8), fecal microbiome analysis showed no significant differences in richness or alpha diversity across various pre-analytical conditions, confirming its stability.
The second substudy (N = 32) found that fecal samples exhibited higher richness and alpha diversity than mucosal biopsies and rectal swabs. There was a 65% overlap in bacterial genera between fecal and mucosal microbiomes. Rectal swabs poorly represented the mucosal microbiome. Minor microbiome composition variations were observed across colonic sampling sites.
Conclusion: The fecal microbiomes from FIT sampling tubes show strong stability across various pre-analytical conditions. Hence, this study highlights the usability of FIT sampling tubes for microbiome research of patients undergoing colorectal cancer resections. While fecal samples could be valid proxies for mucosal microbiomes, rectal swabs may be unreliable due to perianal skin contamination.

Dorsal genital nerve stimulation in patients with faecal incontinence/urgency - a feasibility study with the novel UCon neurostimulator

L.S. Grau[1], P. Christensen[1], N. Qvist[2], N. Klarskov[3], N. Rijkhoff[2], J. Duelund-Jakobsen[1]
[1]Aarhus University Hospital, Department of Surgery, Pelvic Floor Unit, Aarhus, Denmark, [2]Odense University Hospital, Research Unit for Surgery, Odense, Denmark, [3]Herlev University Hospital, Obstetrics and Gynaecology, Herlev, Denmark

Background: UCon neurostimulator is a novel device providing dorsal genital nerve (DGN) stimulation. DGN stimulation has shown efficacy in FI in experimental studies. Patients with faecal incontinence (FI) and faecal urgency (FU) often experience social isolation.
The aim was to explore the safety and the efficacy of the UCon neurostimulator in FI/FU.

We hypothesized that DGN stimulation using the UCon neurostimulator would be feasible and safe, reduce the frequency of FI and strong FU, reduce St. Mark's Incontinence Score (SMIS) and improve quality of life measures.
Method: A prospective multicentre feasibility study in Denmark. Inclusion criteria: ≥18 years reporting FI ≥1/week and/or strong FU ≥3/week together with a SMIS ≥9.
The UCon neurostimulator is connected via adhesive electrodes placed at clitoral hood/root of penis. Home stimulation, time-limited (30 minutes/day) or urge/on-demand (60 sec. session), was performed daily for four weeks.
Safety was evaluated based on device-related serious and adverse events.
Evaluation of efficacy was based on a 14-day bowel habit diary (completed at baseline and in the last 2 of the 4-week stimulation period), SMIS, and impact on daily life (NRS-DL) (0 no impact/10 high impact).
Data analysis was performed on raw data, and presented as median and interquartile range per two weeks.
Results: Forty patients consented to participate (39 women) with a median age of 62 years (interquartile range 54-69 years); 26 completed the study.
Drop-out rate during the intervention was 23.5% and no serious device-related adverse events were seen.
FI (n = 19 with ≥1 episode/week) was significantly reduced from a median of 5 (4-11) to 2 (0-6) (P=0.005) episodes; 14 patients (74%) had ≥50% reduction in FI episodes.
FU (n = 14 with ≥3 episodes/week) was significantly reduced from a median of 11 (9-13) to 5.5 (3-10) (P=<0.001) episodes; 6 patients (43%) had ≥50% reduction in strong FU episodes.
SMIS (n = 26) was significantly reduced from a median of 16.0 (13-18) to 11.5 (9-15) (P=<0.001).
Bowel movements (n = 26) were significantly reduced from a median of 31.5 (24-46) to 25 (20-32) (P=0.001).
NRS-DL (n = 26) improved significantly from a median of 7.0 (7-8) to 5.0 (3-7) (P=<0.001).
Conclusion: Use of the UCon neurostimulator was both feasible and safe. A 4-week stimulation period demonstrated significant, positive results in the treatment of FI and FU.

Clinical Outcomes and Surgical Skills in Laparoscopic Complete Mesocolic Excision

T. Haug[1,2], J.B. Valentin[3], M.-B.W. Ørntoft[2,1], L.H. Iversen[4,2], S.P. Johnsen[3], R. Kennedy[5], D. Miskovic[5], A.H. Madsen[1]
[1]Gødstrup Hospital, Department of Surgery, Herning, Denmark, [2]Aarhus University, Department of Clinical Medicine, Aarhus N, Denmark, [3]Danish Center for Health Services Research, Department of Clinical Medicine, Aalborg, Denmark, [4]Aarhus University Hospital, Department of Surgery, Aarhus, Denmark, [5]St Mark's Hospital, Department of Surgery, Harrow, United Kingdom

Background: Laparoscopic Complete Mesocolic Excision (LCME) has emerged as a promising surgical approach for colon cancer patients, demonstrating improved cancer-specific survival rates. Despite the increasing adoption of LCME, challenges persist in developing strategies to facilitate learning and ensure compliance with its principles. The aim of this thesis is to evaluate clinical outcomes of LCME and explore methods to assess its surgical quality.
Method: National registers was used to examine the 4-year risk of recurrence and 30-day postoperative complications following a population-based LCME implementation. Additionally, existing tools for skill assessment in laparoscopic colon surgery were reviewed. Finally, a novel procedure-specific tool, the Complete Mesocolic Excision Competency Assessment Tool (CMECAT), was developed through interviews and a consensus-based approach and tested on surgeons with varying levels of LCME training.
Results: Results show that LCME, compared to more conventional surgery, is associated with lower risk of recurrence, particularly for stage II cancer patients. Furthermore, LCME was associated with lower rates of postoperative complications. Our review identified 14 tools for skill assessment, primarily designed for specific procedures and lacking robust evidence for their development and application. Finally, the novel tool, CMECAT could successfully differentiate between surgeons at different training levels for right-sided LCMEs but show no difference for left-sided procedures.
Conclusion: This thesis provides the first population-based, multi-centered study on 4-year recurrence rates following LCME. Our findings highlight the benefits of LCME in improving cancer-specific survival, especially for stage II disease. Further, this thesis provides the very first tool specifically designed for LCME. In the future, we hope CMECAT will provide targeted feedback to surgeons in training, and serve as a valuable tool for verifying adherence to LCME principles in research. Future studies are needed to evaluate the applicability of CMECAT to left-sided procedures and to investigate the correlation between CMECAT scores and patient outcome.

The impact of tumor mutations and tumor-infiltrating lymphocytes on prognosis in patients with pMMR localized colorectal cancer – a systematic review and meta-analysis

A.T. Nielsen[1], I.K. Saqi[1], T.F. Justesen[1], M.T. Madsen[2], I. Gögenur[1], A. Orhan[1]
[1]Zealand University Hospital, Center for Surgical Science, Department of Surgery, Køge, Denmark, [2]Slagelse Hospital, Department of Surgery, Slagelse, Denmark

Background: The composition of the tumor microenvironment including the presence of infiltrating lymphocytes and tumor mutations have prognostic and therapeutic significance in colorectal cancer (CRC). Currently, CRC can be divided into two

subtypes based on mismatch repair (MMR) status, known to have an impact on the prognosis and therapeutic approach. In this systematic review and meta-analysis, the association between tumor-infiltrating lymphocytes (TILs) and tumor mutations on survival outcomes in patients with localized CRC and proficient MMR (pMMR) status was examined.
Method: A systematic review of the literature was done and a meta-analysis was conducted in accordance with the PRISMA guidelines. The literature search was based on the Patient, Exposure, Comparison and Outcome (PECO) framework and run on four different literature platforms: PubMed, Embase, Cochrane Library, and Web of Science. The population was patients with localized pMMR CRC. The investigated exposures were TILs (CD3+, CD4+, CD8+, FoxP3+ Treg, CD20+) and tumor mutations often used prior to therapy start (BRAF, KRAS, HER2, NTRK, POLE, POLD1). The outcomes of interest were overall survival, disease-free survival, and cancer-specific survival. The risk of bias was assessed through the Newcastle-Ottawa Scale and the quality of the cumulative evidence was evaluated through the GRADE approach.
Results: In total, 8,498 articles were identified of which 70 articles were included in the systematic review whereas 44 articles were eligible for the meta-analysis. The number of patients included was 33,704. Patients with high infiltration of TILs showed significantly improved overall survival (HR = 0.57, 95% CI: 0.49-0.67, I^2: 0%), especially for the subgroup of CD3+ (HR = 0.52, 95% CI: 0.38-0.71, I^2: 0%) and CD8+ (HR = 0.60, 95% CI: 0.37-0.99, I^2: 10%) TILs. Patients with BRAF mutation (HR = 2.68, 95% CI: 1.47-4.89, I^2: 83%) and KRAS mutation (HR = 1.25, 95% CI: 1.18-1.33, I^2: 0%) showed decreased overall survival.
Conclusion: High infiltration of TILs, especially CD3+ and CD8+, was associated with improved survival, while BRAF and KRAS mutations were linked to worse outcome for patients with pMMR localized CRC.

A systematic review on surgical treatment of recurrent rectal prolapse

A. Bach-Nielsen[1], P. Addison[2], A. K. Martensen[1], J. Duelund-Jakobsen[1], W. R. G. Perry[2], P. Christensen[1]
[1]Aarhus University Hospital, Department of Surgery, Aarhus, Denmark, [2]Mayo Clinic, Division of Colon and Rectal Surgery, Rochester, United States

Background: Despite the range of surgical procedures for treating full-thickness rectal prolapse, recurrence rates remain as high as 31%. Surgical management of recurrent rectal prolapse (RRP) often relies on surgeon preferences due to limited scientific evidence. The choice of redo procedure is complicated by technical aspects of the primary surgery and the number of previous surgically treated recurrences.
This systematic review outlines the results of different procedures in RRP management, aiming to develop an evidence-based treatment algorithm for RRP.
Method: A systematic literature review regarding RRP surgery was conducted using PubMed and Embase, and was performed in accordance with PRISMA guidelines. English-language studies published in peer-reviewed journals since 2004 were included. Main endpoints were re-recurrence rates, functional outcomes, and quality of life (QoL) for each procedure assessed in the studies. The secondary endpoint was a description of the process for selecting RRP surgical procedures.
Results: Fourteen studies were included in the final analysis. Twelve of these were retrospective cohort studies encompassing a total of 871 patients undergoing RRP surgery. The procedures performed were primarily ventral mesh rectopexy (24.11%), Altemeier (18.83%) and Delorme (11.94%). Re-recurrence rates were as high as 42.86%, varying between studies and procedures. Reports on constipation and incontinence were limited, with only one study documenting a median change in Wexner score, which measures incontinence, of 8.0. Two studies reported effects of redo surgery on QoL, showing a mean of 81 out of 100 and a median of 8.0 out of 10, respectively. The method for selecting the redo procedure, described in four studies, was either "*based on the surgeon's experience and/or preference"* or followed a predefined algorithm. Developing a treatment algorithm from these results was not feasible, but a cohort of supplementary studies was used to map a possible pattern in choice of procedures for RRP.
Conclusion: Evidence on treatment of RRP is expanding, but studies remain small and tend to focus on technical and surgical outcomes, while functional outcomes are reported less frequently. A variety of procedures are performed, and re-recurrence rates remain high, with the choice of redo procedure depending on surgeons' preferences. Larger, international cohorts are needed to develop an effective treatment algorithm for surgical management of RRP.

Title: Burden of disease in Pilonidal Sinus: a study comparing the specialist's versus patient's perspective.

L.L. Petersen[1], I. Faurschou[2,3,4], S. Haas[2,3]
[1]Viborg Regional Hospital, Department of Surgery, Viborg, Denmark, [2]Randers Regional Hospital, Department of Surgery, Randers, Denmark, [3]Aarhus University Hospital, Department of Clinical Medicine, Aarhus, Denmark, [4]Aarhus University Hospital, Department of Clinical Epidemiology, Aarhus, Denmark

Background: Little is known about patients' perceptions of pilonidal sinus disease (PSD) or the impact of symptoms on quality of life. Even less is known about healthcare professionals' (HP) perceptions of PSD and PSD-related quality of life. This study examines the differences in disease perception between patients and HPs with a special interest in PSD.
Method: All patients referred for elective PSD surgery at Randers Regional Hospital, Denmark, between 01.10.2022 and 21.11.2023 were included. Patients were asked to rate the impact of 10 factors on their quality of life (pain, smell,

discharge, intimacy, leisure activity, predictability, quality of life, self-esteem, fear of recurrence, and surgery/postoperative recovery). The same questionnaire was repeated on an online platform during the 3rd International Pilonidal Conference in Copenhagen December 2023. The answers were compared between the two groups.
Results: Among 318 eligible patients, 255 participated in the study (response rate of 80%). Among 92 attending HPs, 64 participated in the online survey (response rate of 69.5%). We found significant differences in PSD perceptions between patients and HPs. Overall, HPs tended to overestimate the disease burden, scoring items with a higher impact than patients. However, HPs tended to underestimate the burden of treatment, rating the impact of fear of recurrence lower than patients did while aligning more closely with patients on the burden of postoperative recovery.
Conclusion: Our study shows that though the disease burden in PSD is significant, HPs with special interest in PSD tend to overestimate it. Fear of recurrences and postoperative recovery seem to be the issues most impacting PSD patients' quality of life. These results could guide collaborative decision-making when considering treatment for PSD.

Rectal resection alters anal canal slow-wave activity: new insights into the pathogenesis of low anterior resection syndrome

M. Mekhael[1,2,3], L. Wiklendt[4], G. Sørensen[1,3], M. Majgaard[1,3], T. Juul[1,2,3], P. Vollebregt[5,6], K. Krogh[3,7], C. Knowles[6], P. Dinning[8], M. Scott[6], P. Christensen[1,2,3]
[1]Aarhus University Hospital, Department of Surgery, Aarhus, Denmark, [2]Aarhus University, Department of Clinical Medicine, Aarhus, Denmark, [3]Aarhus University Hospital, Danish Cancer Society Centre for Research on Survivorship and Late Adverse Effects after Cancer in the Pelvic Organs, Aarhus, Denmark, [4]Independent Researcher, Independent Researcher, Adelaide, Australia, [5]Amsterdam University Medical Center, Amsterdam Gastroenterology Endocrinology Metabolism Research Institute, Amsterdam, Netherlands, [6]Queen Mary University of London, National Bowel Research Centre, Blizard Institute, Centre for Neuroscience, Surgery & Trauma, London, United Kingdom, [7]Aarhus University Hospital, Department of Hepatology and Gastroenterology, Aarhus, Denmark, [8]Flinders Medical Centre/College of Medicine and Public Health, Flinders University, Adelaide, Australia

Background: An increasing number of rectal cancer survivors experience bowel dysfunction, known as low anterior resection syndrome (LARS). This condition arises from sphincter-preserving surgery involving a low anterior resection (LAR). The multifactorial LARS pathogenesis is not fully understood, but alterations in anal slow-wave activity may play a role. The aim of this study was to investigate if LAR alters anal slow-wave activity and if alterations (if any) are associated with LARS.
Method: This prospective study included patients undergoing LAR with a partial or total mesorectal excision (PME/TME). High-resolution anal manometry was conducted before and after surgery, and post-ileostomy closure was investigated for TME patients. The severity of post-operative bowel symptoms was assessed by the LARS Score. Age- and sex-matched healthy volunteers (HV) were included as controls.
Results: A total of 34 patients (19 TME/15 PME) and 31 HV were eligible for the analyses. The median age (interquartile range (IQR)) was 66 (56-69) years for patients and 55 (47-61) years for HV, with 23 and 21 males, respectively. Compared with HV, slow-wave activity was altered before surgery, i.e., at the time of diagnosis. LAR additionally altered slow-wave activity significantly compared with before surgery and HV. Alterations were associated with LARS, especially faecal urgency and fragmented defecation. No difference in post-surgical (PME patients) and post-ileostomy closure (TME patients) slow-wave activity was observed. Significantly more TME patients than PME patients developed anal hypotension. Anal hypotension was associated with flatus incontinence and increased stool frequency. No association between post-surgical altered slow-wave activity and anal hypotension was found.
Conclusion: LAR alters anal slow-wave activity, and alterations are associated with LARS.

Treatment of Low Anterior Resection Syndrome in Specialized Multidisciplinary Late Sequelae Clinics: a Prospective Cohort Study

M. Mekhael[1,2,1], H.Ø. Kristensen[2,1], M. Borre[1,7], A.M. Drewes[1,3], K.J. Emmertsen[1,4], J. Fassov[5,1,7], K. Krogh[1,7], M.B. Lauritzen[1,6], S. Laurberg[2,1], J.L. Poulsen[1,3], O. Thorlacius-Ussing[1,6,7], P. Christensen[2,5,1], T. Juul[2,5,1]
[1]Aarhus University Hospital, Department of Surgery, Aarhus, Denmark, [2]Aarhus University, Department of Clinical Medicine, Aarhus, Denmark, [3]Aarhus and Aalborg University Hospitals, Danish Cancer Society Centre for Research on Survivorship and Late Adverse Effects after Cancer in the Pelvic Organs, Aarhus and Aalborg, Denmark, [4]Aarhus University Hospital, Department of Hepatology and Gastroenterology, Aarhus, Denmark, [5]Aalborg University Hospital, Department of Gastroenterology and Hepatology, Aalborg, Denmark, [6]Randers Regional Hospital, Department of Surgery, Randers, Denmark, [7]Aalborg University Hospital, Department of Gastrointestinal Surgery, Aalborg, Denmark, [8]Aalborg University, Department of Clinical Medicine, Aalborg, Denmark

Background: An increasing number of rectal cancer survivors experience LARS, heightening the need for specialized treatment. The aim of this prospective cohort study was to evaluate the effect of a multidisciplinary effort involving surgical and gastroenterological departments in managing bowel dysfunction, specifically low anterior resection syndrome (LARS), following rectal cancer treatment.

Method: Patients referred to our late sequelae clinics with LARS following sphincter-preserving treatment were eligible for inclusion. Patients were treated in the surgical or gastroenterological units or both based on symptoms. Patients completed patient-reported outcome measures at the first visit, upon discharge, and 12 months after discharge. Treatment effects were evaluated by the LARS score and its five single items, six single items covering additional LARS symptoms, the EuroQoL 5-dimension 5-level (EQ-5D-5L) VAS and utility scores, self-rated bowel function, and bowel function impact on quality of life (QoL).
Results: We included 282 patients; 201 were eligible for statistical analyses. Three-quarters were treated in the surgical units, whereas the rest required gastroenterological treatment. After treatment, the mean LARS score decreased by 4.7 points ($p < 0.001$), whereas the mean EQ-VAS and utility score increased by 7.1 ($p < 0.001$) and 0.06 points ($p < 0.001$), respectively. All individual symptoms significantly improved. Improvement in self-rated bowel function and bowel function impact on QoL were reported by 55.8% ($p < 0.001$) and 45.7% ($p < 0.001$) of patients, respectively. Similar results were recorded at the 12-month follow-up.
Conclusion: These results encourage establishing late sequelae clinics with a joint gastroenterological and surgical approach to treat LARS following rectal cancer treatment.

Rethinking Diminutive Polyp Management: A Comprehensive Study from Denmark's National Pathology Database

A. Eller[1,2], L.B. Grode[2], M.B. Larsen[3], A.K. Dige[4]
[1]Regional Hospital of Viborg, Department of Surgery, Viborg, Denmark, [2]Regional Hospital of Horsens, Department of Medicine, Horsens, Denmark, [3]Regionshospitalet Horsens, Department of Research, Horsens, Denmark, [4]Aarhus University Hospital, Department of Hepatology and Gastroenterology, Aarhus N, Denmark

Background: Colorectal cancer (CRC) is the second leading cause of cancer-related deaths globally. However, nationwide screening programs, such as those implemented in Denmark, have reduced the incidence. Diminutive polyps (DP, 1-5 mm) are the most frequently detected lesions during colonoscopies, yet their clinical significance remains debated, as the likelihood of advanced histology (AH) or malignancy is extremely low. Despite this, current guidelines recommend their removal and pathological evaluation. Given the minimal risks posed by these polyps, there is growing support for the "resect and discard" strategy, which eliminates the need for histological examination in favor of visual assessment, potentially reducing healthcare costs.
Method: This retrospective cohort study utilized data from the Danish National Patient Register and the National Pathology Data Bank, focusing on patients aged over 18 who underwent colonoscopy or sigmoidoscopy from January 2014 to December 2021. The analysis included 618.489 colorectal lesions identified from pathology reports, with a specific focus on lesion size and histopathology.
Results: Our cohort included 217.109 unique patients, with a near-equal gender distribution and a median age of 66 years. Of the polyps with size data available, 66.3% were diminutive (1-5 mm), and 85.4% were in the 1-9 mm size range. Cancer occurrence in DP was exceedingly rare, with only 24 cases among 319,221 DPs, resulting in a prevalence of 0,01%. Larger polyps (≥10 mm) were more likely to present with advanced histology.
Conclusion: This large-scale study, which is the first to analyze a European population at this scale, demonstrates that malignancy is an extremely rare finding in DP. Based on this we suggest that histological examination of DPs can be omitted. Our findings contribute to the ongoing discussion around the potential adoption of a "resect and discard" strategy to enhance the efficiency of CRC screening programs. Further results, including detailed analysis of polyp characteristics and their association with histological outcomes are forthcoming.

Development and validation of a clinical prediction model for one-year mortality following elective colorectal cancer surgery

A.W. Rosen[1], I. Ose[1], L.P.K. Andersen[2], M. Gögenur[1], R.D. Bojesen[1], R.P. Vogelsang[1], A.F. Juvik[1], T. Fransgård[1], M.H. Thomsen[1], M. Seiersen[1], S.K. Brisling[1], S.Y. Turiño[1], N.A. Frederiksen[1], M.H. Rose[1], J.R. Eriksen[1], I. Gögenur[1]
[1]Zealand University Hospital, Center for Surgical Science, Department of Surgery, Køge, Denmark, [2]Zealand University Hospital, Deptartment of intensive care, Køge, Denmark

Background: Postoperative morbidity is frequent following colorectal cancer (CRC) surgery and adversely affects long-term survival. Targeting perioperative care to prevent complications in high-risk patients has previously been shown to reduce complications. Clinical prediction models can synthesize a single risk estimate from a large amount of data with complex patterns, which can be used for a patient-centered and comprehensive assessment of patient risks. In this study, we aim to develop and validate a clinical prediction model based on routinely available clinical data to quantify the risk of 1-year postoperative mortality.
Method: National registry data on patients undergoing elective curative-intent surgery for CRC between January 1, 2014, and April 1, 2019, were retrieved and used for model training and internal validation. External validation was done in retrospective patient data between January 1, 2020, and December 31, 2022, from the center for which the model was

developed. A least absolute shrinkage and selection operator logistic regression was trained to classify the probability of mortality within 365 days following surgery. Model discrimination and calibration were evaluated, and the event probability of mortality medical complications and surgical complications were investigated in predefined risk groups based on predicted risk of ≤1%, >1 - ≤5%, >5 - ≤15%, and >15%, styled grouped A, B, C, and D, respectively.
Results: 13803, 4600, and 806 patient cases were used for training, internal validation, and external validation of the model, respectively. The final model included 58 variables and showed good discrimination with an area under the receiver operator curve of 0.77 (95% CI: 0.74-0.80) and 0.79 (95% CI: 0.71-0.87) in the internal- and external validation sets, while the model tended to overpredict at higher predictions. Point estimates of the incidence proportion of mortality and medical complications increased monotonically with more advanced risk groups in all evaluation sets.
Conclusion: The prediction model performed satisfactorily as a binary classifier based on routinely available data retrieved from national registers, both when evaluated in registry data and local data. The utility of the risk strata to identify high-risk patients is supported by the increasing rate of postoperative events in more advanced risk groups. The model can potentially be used as a low-cost scalable solution to support decision-making in preoperative risk assessment.

Preoperative ctDNA, the tumor microenvironment, and the risk of recurrence in non-metastatic colorectal cancer

M. Gögenur[1], L. Balsevicius[1], S.Ø. Jensen[1,2], N. Øgaard[1,2], I. Lyskjær[1,2], T.F. Justesen[3], M. Bzorek[4], A.-M.K. Fiehn[4,5], L.R. Walker[6], R.D. Bojesen[3,6], A.W. Rosen[3], C.L. Andersen[1,2,7], I. Gögenur[3,5,7]
[1]Zealand University Hospital, Center for Surgical Science, Department of Surgery, Køge, Denmark, [2]Aarhus University Hospital, Department of Molecular Medicine, Aarhus N, Denmark, [3]Aarhus University Hospital, Department of Clinical Medicine, Aarhus N, Denmark, [4]Zealand University Hospital, Department of Pathology, Roskilde, Denmark, [5]University of Copenhagen, Department of Clinical Medicine, Copenhagen N, Denmark, [6]Slagelse Hospital, Department of Surgery, Slagelse, Denmark, [7]Danish Colorectal Cancer Group, Danish Colorectal Cancer Group, Copenhagen, Denmark

Background: Recurrence after curative-intent surgery for colorectal cancer is a major cause of cancer-related death. Circulating cell-free tumor DNA (ctDNA) is increasingly used in the perioperative setting to detect residual disease. However, the association between preoperative ctDNA, the tumor microenvironment, including tumor-infiltrating lymphocytes, and recurrence is unknown.
Method: In a prospective cohort study, we explored the association between ctDNA (assessed using a tumor-agnostic hypermethylated cfDNA test), immune infiltration (assessed with immunohistochemistry staining of CD3 and CD8 positive lymphocytes) and the tumor microenvironment (assessed with a NanoString gene expression panel) in patients with non-metastatic CRC undergoing curative-intent surgery. ctDNA was assessed using a tumor-agnostic hypermethylated cfDNA test
Results: Among 140 patients, ctDNA tested positive in 102 (72.9%) before surgery, with 38 (27.1%) tumors classified as immune infiltration high. ctDNA positivity was associated with a more metastatic phenotype and with a less immunologically active phenotype in the tumors. High immune infiltration was associated with reduced expression of genes related to cancer metastasis, and with a higher expression of genes related to immune activity. Combining the ctDNA test with clinically used risk factors for recurrence, such as clinical N stage and MMR status, revealed that ctDNA was able to differentiate phenotypes within these factors. Finally, in an elastic net regression model with recurrence as the outcome, ctDNA levels were attributed high importance, while clinical factors and immune infiltration also were important for the prediction.
Conclusion: Our results suggest that the tumor phenotype could be determined by analysis of preoperative ctDNA

Safety and efficacy of irreversible electroporation and anti-PD1 treatment for patients with metastatic gastrointestinal cancer

T.F. Justesen[1], A. Orhan[1], O.W. Fischer[1], P.C. Petersen[2], R. Altaf[2], M. Bulut[3,4,5], M.B. Andersen[1], A.T. Nielsen[1], I.K. Saqi[1], M.K.S. Soerensen[1], L. Balsevicius[1], M. Gögenur[1], K. Høst-Rasmussen[1], B. Cappelen[1], T.B. Lunen[6], S.M. Knudsen[6], V.R. Eriksen[6], M. Kondrup[2], J.E. Szpejewska[2], E. Lassen[7], W. Abdul-Wahid[7], D.L. Pedersen[7], L.B. Hansen[3], C. Qvortrup[8], L.T. Kirkeby[3], B.H. Joergensen[9], C. Nolsoe[9,5], I. Gögenur[1,4]
[1]Zealand University Hospital, Center for Surgical Science, Køge, Denmark, [2]Zealand University Hospital, Department of Oncology, Roskilde, Denmark, [3]Zealand University Hospital, Department of Surgery, Køge, Denmark, [4]University of Copenhagen, Department of Clinical Medicine, Copenhagen, Denmark, [5]University of Copenhagen, Copenhagen Academy for Medical Education and Simulation (CAMES), Copenhagen, Denmark, [6]Zealand University Hospital, Department of Anestesiology, Køge, Denmark, [7]Zealand University Hospital, Department of Radiology, Roskilde, Denmark, [8]Rigshospitalet, Department of Oncology, Copenhagen, Denmark, [9]Zealand University Hospital, Center for Surgical Ultrasound, Køge, Denmark

Background: Colorectal and pancreatic cancers are the third and eleventh most common cancers. The introduction of immunotherapy has changed the treatment landscape of many cancers, however, not in those with cold tumour

microenvironments. Thus, novel treatments are needed to improve the prognosis of these patients, particularly those with stage IV disease.
Method: This single-center phase II clinical study investigated the safety and efficacy of irreversible electroporation and anti-PD1 treatment in patients with metastatic pancreatic (NCT05435053) and metastatic proficient mismatch repair colorectal cancer (NCT05609656). The included patients were aged ≥ 18 years, had Eastern Cooperative Oncology Group performance status of 0 or 1, metastatic disease, and exhausted standard treatment options. Patients were treated with ultrasound-guided irreversible electroporation of a single liver metastasis followed by anti-PD1 treatment for up to six (nivolumab) or twelve months (pembrolizumab) for patients with pancreatic and colorectal cancer, respectively. Furthermore, patients with colorectal cancer underwent calcium electroporation treatment of the primary tumor just before the irreversible electroporation treatment. A response evaluation was done two months after the start of treatment by CT scan.
Results: A total of 13 patients were included between 2022 and 2023. The patients had a median age of 74 years and all patients had received at least one line of chemotherapy (range 1-5). Nine patients had pancreatic cancer and four had colorectal cancer. Due to rapid deterioration of their disease, two patients were excluded before receiving any study treatments. One patient with colorectal cancer had a complication to the electroporation treatments, a case of grade 3 fever and grade 2 atrial fibrillation. Seven patients experienced a total of 16 grade 3 or 4 adverse events, only one of which (a case of cholangitis) was treatment related. At the two-month response evaluation, ten patients had CT verified progression of the disease, while one patient had stable disease. The median overall survival in the 11 treated patients was 4.1 months (range, 2.3-9.0 months).
Conclusion: In conclusion, irreversible electroporation and anti-PD1 treatment were safe in patients with metastatic pancreatic and colorectal cancer, however, no clinical efficacy was seen. Coming studies should explore other treatment options for this patient population, which has a great unmet need for better treatments.

Insights into the group of surgically resectable but Non-Operable Patients with Colorectal Cancer

I. Ose[1], A. Orhan[1], S. Eraslan[1], E. Gögenur[1], C. Alexandersen[1], A. Righult[1], E. Ayhan[1], A. Nielsen[1], I. Saqi[1], I. Gögenur[1]
[1]Center for Surgical Science, Zealand University Hospital, Department of Surgery, Koege, Denmark

Background: The incidence of colorectal cancer is expected to increase, particularly among patients with significant frailty and comorbidities. A subgroup of these patients may not be suitable for surgery due to the high-risk of postoperative morbidity and mortality. The aim of this study was to characterize the clinical outcomes, management, social status, and survival of patients deemed non-operable due to comorbidity and/or frailty.
Method: Patients diagnosed with resectable colorectal cancer but deemed non-operable due to comorbidity and/or frailty by a Multi-Disciplinary Team between January 1, 2020 and April 30, 2024 were included in this study. The primary outcome was to describe the current population, investigate mortality, and explore mortality-related risk factors in the current population. Overall survival was estimated using the Kaplan-Meier method. Cox proportional-hazards model was used to estimate hazard ratios and 95% confidence intervals for mortality associated modifiable risk factors.
Results: During the study period, 69 out of 1667 patients were potentially resectable but were deemed non-operable and included in the study population. The rate of 90-days and 1-year mortality was 20% and 52%, respectively. Three-years after the diagnosis 12% of the patients were alive. At the time of diagnosis, anemia was found in 73% of female patients and 71% of male patients. Additionally, 77% of the patients had hypoalbuminemia. Lower albumin levels were associated with poor survival, hazard ratio of 0.92 (95% Confidence Interval: 0.88-0.98, p=0.007).
Conclusion: Mortality in the current population was high. However, our findings highlight potential areas for improvements in the management of these patients.

AI-Driven Personalized Perioperative Management in Colorectal Cancer: A randomized Controlled Clinical Trial - The AIDPRO-CRC trial: a study protocol

M.N. Jung[1], M.B. Lauritzen[2], K. Emmertsen[3], H.G. Smith[4], M.L. Kjær[5], M.F. Nielsen[6], I. Al-Najami[7], J.R. Eriksen[1], I. Gögenur[1]
[1]Zealand University Hospital, Center for Surgical Science, Surgical Department, Køge, Denmark, [2]Aalborg University Hospital, Department of Gastrointestinal Surgery, Aalborg, Denmark, [3]Regional Hospital Randers, Department of Surgery, Randers, Denmark, [4]Bispebjerg Hospital, University of Copenhagen, Abdominal Center K, Copenhagen Ø, Denmark, [5]Hospital Hvidovre, University of Copenhagen, Gastro Unit, Surgical Division, Hvidovre, Denmark, [6]University Hospital of Southern Denmark Aabenraa, Department of Surgery, Aabenraa, Denmark, [7]Odense University Hospital Svendborg, Department of Colorectal Surgery, Svendborg, Denmark

Background: Colorectal cancer (CRC) treatment primarily involves surgical resection, with some patients receiving additional oncological therapy. While advances like minimally invasive surgery and Enhanced Recovery After Surgery protocols have improved outcomes, complications and readmissions remain high. AI-driven patient risk stratification, as shown in pilot studies, can help tailor perioperative care, reducing postoperative complications and thus improve recovery. The AIDPRO-CRC trial aims to build on experience gained from pilot studies by using an AI model, trained on data from

more than 75,000 patients, to improve risk profiling and optimize perioperative treatment for CRC patients. The trial strives to investigate the clinical effects of an AI-augmented solution for optimization of perioperative treatment by personalized risk stratification of patients undergoing CRC surgery.
Method: The AIDPRO-CRC trial is an investigator-initiated nationwide multicenter randomized controlled trial enrolling 1600 patients with newly diagnosed colorectal cancer at 8 CRC centers in all five regions in Denmark. The trial starts in January 2025 with an enrolment period of two years. Patients will be randomized to either an AI-augmented risk stratification model (intervention arm) or a surgical expert-based risk stratification model (control arm). Based on their estimated risk of 1-year mortality, they will receive individualized predefined treatment bundles, gradually increasing in scope and intensity taking into consideration the patient's frailty, overall medical and surgical history, and current health status. Treatment bundles include pre-, peri-, and postoperative interventions, all based on established evidence and national guidelines.
Results: The primary outcome is the rate of complicated postoperative courses within 30 days of surgery, and secondary outcomes include the level of agreement between the AI-augmentation model and expert-based prediction model, rate of medical complications, length of stay and long term follow-up. In addition, we aspire to investigate the impact on mortality, physical performance, patient-reported postoperative recovery and perform health economic analysis.
Conclusion: This national trial could transform perioperative care by providing personalized treatment, benefiting both patients and clinicians through reduced complications, shorter hospital stays, and cost savings while laying the foundation for future expansion of AI-assisted decision-making in surgical cancer care.

The association between NT-pro-BNP and AI-predicted one year mortality in patients with colorectal cancer

J.A. Zahid[1], E.C. Ayhan[1], S. Eraslan[1], L.P.K. Andersen[2], I. Gögenur[1]
[1]Zealand University Hospital, Department of Surgery, Køge, Denmark, [2]Zealand University Hospital, Department of Anaesthesiology, Køge, Denmark

Background: Advancements in treatment of colorectal cancer (CRC) have improved both short- and long-term mortality and morbidity after surgery. However, up to 45% of patients still suffer from postoperative complications, which is an independent risk factor for long-term mortality. Previous studies have found that cardiovascular complications increase the risk of 1-year mortality in patients after CRC surgery. Thus, there is a need for improving preoperative identification of patients in risk of postoperative complications and mortality. We investigated if preoperative NT-pro-BNP, which is a biomarker related to the patient's cardiovascular health, was associated with a predicted risk of 1-year mortality for patients undergoing elective CRC surgery with curative intent.
Method: An algorithm based on Artificial Intelligence (AI) was used to predict the risk of 1-year postoperative mortality in patients undergoing elective CRC surgery with curative intent. Patients were classified as having low risk of 1-year postoperative mortality if the predicted risk was below 5% and high risk if it was above 5%. Preoperative measurements of NT-pro-BNP were performed up to 24 hours before surgery. We investigated if there was a difference in NT-pro-BNP values between patients with low versus high risk of 1-year mortality.
Results: A total of 193 patients had a preoperative NT-pro-BNP measurement. In patients predicted with low risk of 1-year mortality, the median NT-pro-BNP value was 12 pmol/L [IQR: 5.5 – 22.5] and in patients predicted with high risk of 1-year mortality, the median value was 30.5 pmol/L [IQR: 14.5 – 75]. There was a statistically significant difference between the preoperative NT-pro-BNP measurement in patients with AI-predicted low vs. high risk of 1-year mortality, $p < 0.001$.
Conclusion: Preoperative NT-pro-BNP values in patient undergoing elective CRC surgery with curative intent are significantly associated with an AI-predicted postoperative 1-year mortality.

Supporting colorectal cancer treatment planning using machine-learning models in multidisciplinary care conferences (AID-SIM)

K.B. Bräuner[1], M. Nordblad Jung[1], I. Gögenur[1]
[1]Zealand University Hospital, Deparment of Surgery, Køge, Denmark

Background: The multidisciplinary team (MDT)-conference is an essential part of individualized cancer treatment[1–3]. Implemented in Denmark in 2005 and optimized over the years, these conferences are the gold standard for decision making in cancer surgery[4,5]. However, the level of information about patients available at MDT and the use of perioperative optimization according to this information varies greatly between hospitals[5]. The aim of this study is to develop and test a machine learning algorithm estimating a risk for the patient based on preoperatively available information, providing a tangible measure of the patient's need of prehabilitation or surgical considerations.
Method: Using four Danish observational health databases, we harmonized data to an Observational Medical Outcomes Partnership Common Data Model (OMOP-CDM)[6,7]. We trained a prediction model for 1-year postoperative mortality using a Least Absolute Shrinkage and Selection Operator logistic regression model[8,9]. The results of the model were delivered in percentage of risk and stratified into four groups: A (< 1 % risk), B (1-5 % risk), C (5-15 % risk), and D (> 15 % risk) each corresponding to a perioperative optimization regimen. We designed a web application (MDT+) providing the user with a

structured overview of patient information and a predicted risk bracket.
We scheduled four simulated MDT conferences per site. Each conference included six patients, one A, one B, two C's, and two D's. The patients shifted at each MDT in order to avoid recall bias. The first MDT would be performed as the usual standard without any prediction models and with a simple paper note with each patient referral. The second would be using the MDT+ platform, which has a structured data overview but without prediction models. The third would use the standard MDT referral notes on paper supplemented with a predicted risk and risk group. The fourth would contain both MDT+ and prediction models for a total overview. When prediction models were not available, the clinicians should estimate a risk.
Repeated measures analysis was used to compare differences between clinician- and model-estimated risk and the team's experience with the system was assessed with questionnaires and interviews
Results: The MDT simulations are held after the abstract submission deadline. Three to four surgical departments across the regions have agreed to participate.
Conclusion: We succesfully trained the 1-year mortality model and designed the MDT+ application. The final results will be presented at the annual meeting in November.

Association Between a 1-Year Mortality Prediction Model and Return to Intended Oncological Treatment in Colorectal Cancer Patients

E. Gögenur[1], I. Ose[1], A. Rosen[1], A. Orhan[1], I. Gögenur[1]
[1]Zealand University Hospital, Center for Surgical Science, Koege, Denmark

Background: Ensuring that patients receive the intended postoperative oncological treatment is crucial for improving long-term oncological outcomes and survival rates. However, many patients do not receive the intended oncological treatment due comorbidities and postoperative complications. Return to intended oncological treatment (RIOT) is defined as the proportion of patients who receive the intended oncological treatment relative to the total number of patients with indication of oncological treatment. Prehabilitation has been shown to improve postoperative outcomes, particularly for high-risk patients and might have a positive impact on RIOT. The aim of this study was to investigate the association between risk groups based upon a 1-year mortality prediction model and RIOT in patients undergoing surgery for colorectal cancer, and to investigate whether there was an association between risk group tailored interventions and improved RIOT outcomes.
Method: This retrospective cohort study included patients who underwent elective surgery with curative intend for colorectal cancer between January the 1st 2020, and December the 21st 2023, at Zealand University Hospital. Based on predicted risk of 1-year mortality, patients were stratified into high-risk (≥5%) and low-risk (<5%) groups. Patients operated between February the 1st 2023, and December the 21st 2023, received risk tailored perioperative interventions aimed to improve postoperative outcomes. The primary outcome was the likelihood of returning to intended oncological treatment based on the risk groups and the effect of risk group tailored interventions on RIOT and was investigated with logistic regression models.
Results: A total of 1003 patients were included in the analysis, of which 293 (29,2%) had a clinical indication for adjuvant chemotherapy, of which 222 (75.8%) patients achieved a RIOT. In the group of patients with clinical indication for adjuvant chemotherapy, there was a statistically association between belonging to a high risk group and RIOT (OR: 0.195, 95% CI: 0.109-0.344), while no statistically significant association was found between risk group tailored interventions and RIOT (OR: 1.033, 95% CI: 0.488-2.315).
Conclusion: This study demonstrates that high-risk colorectal cancer patients are significantly less likely to RIOT, highlighting the need for optimizing prehabilitation to improve postoperative outcomes for these patients. The investigated interventions were not associated significantly with RIOT outcomes.

A map of medical complications after elective colorectal cancer surgery in a modern setting – Before and after implementing AI-enhanced risk stratification

C. Alexandersen[1], M. Frandsen[1], A. Thomsen Nielsen[1], A. Righult[1], I. Kolukisa Saqi[1], I. Ose[1], I. Gögenur[1]
[1]Zealand University Hospital, Department of Surgery, Køge, Denmark

Background: Even in a modern perioperative setting up to 45% of patients undergoing colorectal cancer (CRC) resection develop postoperative medical complications (POMC), reducing quality of life and long-term survival. Personalized risk stratification and treatment plans have shown potential to reduce occurrence of POMC. Our primary aim was to provide a detailed description of POMC occurring after elective CRC surgery before and after the implementation of AI-based personalized risk assessment followed by risk-tailored perioperative interventions (AID-SURG). Secondarily, we assessed whether this implementation influenced the postoperative complication profile.
Method: This was a single-center retrospective study including all patients undergoing CRC resection between January 1st, 2020, and December 31st, 2023. Patients were divided into two cohorts, those treated before (Comparator) and those

treated after implementation of an AI-based risk assessment tool at our institution on February 1st , 2023 (AID-SURG). We registered POMC with Clavien-Dindo (CD) grade 2 and above occurring within 90 days postoperatively.
Results: There were 806 patients in the Comparator cohort and 194 in the AIDSURG cohort respectively.
Number of POMC per patient were reduced by 0.17 complications per patient [95% CI, 0.08-0.27] in the AIDSURG cohort relative to the Comparator cohort along with a decrease in CD2 complications from 0.34 to 0.16 per patient.
Gastrointestinal, pulmonary and infectious complications were the most common in both groups, all decreasing in the AIDSURG cohort compared to the Comparator cohort. At the most detailed level, the implementation of AID-SURG conferred an asymmetrical effect on distribution of POMC with the largest absolute reduction in paralytic ileus, urinary retention and anemia (0.034, 0.023 and 0.021 fewer occurrences per patient, respectively).
Conclusion: Implementation of an AI-based risk stratification and personalized interventions reduces overall POMC and changes the distribution of specific POMC with the largest impact on paralytic ileus, urinary retention, and anemia.

Regional differences in radiological surveillance for non-metastatic colorectal cancer patients in Denmark – nationwide cohort study 2010-2019

J. Nors[1,2,3], K.A. Gotschalck[2,4,5], P. Bondeven[2,3], R. Erichsen[2,3,6], L.H. Iversen[2,5,7], O. Thorlacius-Ussing[8], P.V. Andersen[9], M.F. Klein[5,10,11], I. Gögenur[5,11,12,13], C.L. Andersen[1,2,5]
[1]Aarhus University Hospital, Department of Molecular Medicine, Aarhus, Denmark, [2]Aarhus University, Department of Clinical Medicine, Aarhus, Denmark, [3]Randers Regional Hospital, Department of Surgery, Randers NØ, Denmark, [4]Horsens Regional Hospital, Department of Surgery, Horsens, Denmark, [5]Danish Colorectal Cancer Group, DCCG, Copenhagen, Denmark, [6]Aarhus University Hospital, Department of Clinical Epidemiology, Aarhus, Denmark, [7]Aarhus University Hospital, Department of Surgery, Aarhus, Denmark, [8]Aalborg University Hospital, Department of Surgery, Aalborg, Denmark, [9]Odense University Hospital, Department of Surgery, Odense, Denmark, [10]Copenhagen University Hospital - Herlev and Gentofte, Department of Surgery, Herlev, Denmark, [11]University of Copenhagen, Department of Clinical Medicine, Copenhagen, Denmark, [12]University Hospital Zealand, Center of Surgical Sciences, Køge, Denmark, [13]University Hospital Zealand, Department of Surgery, Køge, Denmark

Background: **Background:** Despite curative-intent treatment, ~20% of non-metastatic colorectal cancer (CRC) patients experience recurrence. Danish CRC surveillance guidelines recommend CT scan of the thorax, abdomen, and pelvis at 12 and 36 months postoperative. We aimed to explore regional variation in radiological surveillance intensity and its association with recurrence detection and survival.
Method: **Method:** Nationwide cohort study including UICC TNM stages I-III CRC patients in Denmark who underwent curative-intent surgery during 2010-2019 identified from the Danish Colorectal Cancer Group database. Through individual-level linkage of data from nationwide health registries, recurrence status was determined using a validated algorithm. Patients were followed from surgery until recurrence, death, second cancer, or up to 5 years. Cumulative incidence function (CIF) of recurrence were reported by region (North, Central, South, Zealand, and Capital). Intensity of surveillance was calculated as number of CT scans ("UXCC/UXCD" in the Danish National Patient Registry) pr. 1,000 person years (PYs) and compared as incidence rate ratios (IRR) with 95% CI. An accelerated failure time (AFT) model was constructed to compare time to recurrence (TTR) between regions. Cox proportional hazards regression was used to assess post-recurrence survival and was reported as hazard ratios (HR) with 95% CI.
Results: **Results:** Of the 23,154 included patients, 4147 (18%) developed recurrence within 5 years after surgery. The 5-year CIF ranged from 15% (95% CI: 14%-17%, North) to 20% (95% CI: 19%-21%, Central).
All five regions perform CT scans at 12 and 36 months with the fraction of disease-free patients being scanned ranging from 57% (Zealand) to 81% (North) at 12 months and from 54% (Zealand) to 67% (North) at 36 months.
The rate of CT scans per 1,000 PY during surveillance ranged from 601 (North) to 814 (Capital) scans s corresponding to an IRR of 1.35 (95% CI: 1.32-1.39). The Capital Region (Highest surveillance intensity) was associated with shorter TTR (time ratio = 0.82, 95% CI: 0.72-0.92, AFT model) compared to the North Region (Lowest surveillance intensity) equivalent to a difference of 1.9 months in adjusted median TTR. High surveillance intensity was not associated with decreased post-recurrence mortality (HR=1.09, 95% CI: 0.93-1.28) compared to low intensity.
Conclusion: **Conclusion:** The intensity of radiological surveillance varies between Danish regions and was not associated with post-recurrence mortality.

Circulating Tumor DNA and Risk of Recurrence in Patients with Asymptomatic versus Symptomatic Colorectal Cancer

M.-B.W. Ørntoft[1,2], N. Øgaard[2], S.Ø. Jensen[2], C. Demuth[2], M.H. Rasmussen[2], T.V. Henriksen[2], J. Nors[3], A. Frydendahl[2], I. Lyskjær[2], M. Nesic[3], C. Therkildsen[4], J. Kleif[5], M. Gögenur[6], L.N. Jørgensen[7], J. Vilandt[8], J.B. Seidelin[9], K.G. Anderson[10], C. Jaensch[1], B. Andersen[11], U.S. Løve[12], O. Thorlacius-Ussing[13], P.V. Andersen[14], T. Kolbro[15], A. Monti[16], J. Kildsig[17], P. Bondeven[18], N.H. Schlesinger[7], L.H. Iversen[19], M. Rasmussen[7], I. Gögenur[6], J.B. Bramsen[2], C.L. Andersen[2]
[1]Regional Hospital Gødstrup, Deparment of Surgery, Herning, Denmark, [2]Aarhus University Hospital, Department of Molecular Medicine, Aarhus N, Denmark, [3]Aarhus University, Department of Clinical Medicine, Aarhus N, Denmark,

[4]Copenhagen University Hospital, Gastro Unit, Surgical Section,, Amager-Hvidovre, Denmark, [5]Copenhagen University Hospital, Gastro Unit, Surgical Section, Amager-Hvidovre, Denmark, [6]University Hospital Zealand, Center for Surgical Science, Department of Surgery, Køge, Denmark, [7]Bispebjerg Hospital, Digestive Disease Centre BFH, Copenhagen, Denmark, [8]Nordsjællands Hospital, Department of Surgery, Hillerød, Denmark, [9]Herlev Hospital, Department of Gastroenterology and Hepatology, Herlev, Denmark, [10]Region hospital Horsens, Department of Surgery, Horsens, Denmark, [11]Randers Regional Hospital, Department of Public Health Programs and University Research Clinic for Cancer Screening, Randers, Denmark, [12]Regional hospital Viborg, Department of Surgery, Viborg, Denmark, [13]Aalborg University Hospital, Clinical Cancer Research Center, Aalborg, Denmark, [14]Odense University Hospital, Department of Surgery, Odense, Denmark, [15]Odense University Hospital, Department of Surgery, Svendborg, Denmark, [16]North Denmark Regional Hospital Hjørring, Department of Surgery, Hjørring, Denmark, [17]Copenhagen University Hospital, Department of Surgery, Herlev, Denmark, [18]Regional Hospital Randers, Department of Surgery, Randers, Denmark, [19]Aarhus University Hospital, Department of Surgery, Aarhus N, Denmark

Background: Multiple initiatives aim to develop circulating tumor DNA (ctDNA) tests for early cancer detection and prognosis. The few studies describing ctDNA testing in both asymptomatic and symptomatic patients report lower ctDNA detection in the asymptomatic patients. In the present study we explored ctDNA detection in colorectal cancer (CRC) patients, and whether ctDNA was a predictor of cancer prognosis, with two different detection methods.
Method: ctDNA detection was performed in two independent Danish cohorts of consecutively recruited patients with asymptomatic CRC (Cohort#1: n=215, Cohort#2: n=368) and symptomatic CRC (Cohort#1: n=117, Cohort#2: n=722). One detection method was methylation-based and tumor-agnostic (Cohort#1); the other method was mutation-based and tumor-informed (Cohort#2).
Results: After adjusting for tumor stage and size, the odds of ctDNA detection were significantly lower in asymptomatic patients compared to symptomatic patients (Cohort#1: OR: 0.3, 95%CI: 0.1-0.6, Cohort#2: OR: 0.7, 95%CI: 0.5-0.9). The recurrence risk was lower in asymptomatic patients (Cohort#1: sHR: 0.6, 95%CI: 0.3-1.2, Cohort#2: sHR: 0.6, 95%CI: 0.4-1.0) and notably, ctDNA-negative asymptomatic patients had the lowest recurrence risk compared to the symptomatic patients (Cohort#1: sHR: 0.2, 95%CI: 0.1-0.6, Cohort#2: sHR: 0.3, 95%CI: 0.2-0.6).
Conclusion: Our study confirms that ctDNA detection is lower in asymptomatic CRC patients independently of TNM stage or tumor size. Further, we show that ctDNA is a strong prognostic marker, as ctDNA-negative asymptomatic cancer patients have significantly lower risk of recurrence compared to symptomatic patients. Our results suggest that ctDNA could be used for risk-stratification in a personalized recurrence surveillance programs in the future and should prompt discussions about de-escalation of therapy for ctDNA-negative asymptomatic CRC patients.

Incidence of recurrence in pT1 rectum cancer following local excision or TME: a nationwide registry-based cohort study

H. Smith[1], J. Nors[2,3], P.-M. Krarup[1], A. Nordholm-Carstensen[1], N. Schlesinger[1], C.L. Andersen[2,3]
[1]Copenhagen University Hospital - Bispebjerg and Frederiksberg, Abdominalcenter K, København, Denmark, [2]Aarhus University Hospital, Department of Molecular Medicine, Aarhus, Denmark, [3]Aarhus University Hospital, Department of Clinical Medicine, Aarhus, Denmark

Background: Local excision (LE) is an increasingly popular strategy for organ preservation in patients with early (pT1) rectal cancer, avoiding the morbidity associated with total mesorectal excision (TME). However, there are limited data regarding the impact of prior LE on oncological outcomes. This study investigated the risks of local and systemic recurrence associated with different treatment strategies in patients with pT1 rectal cancer.
Method: Nationwide cohort study including all patients undergoing surgery for pT1 primary rectal cancer in Denmark from 2016-2019. Patients were identified from the DCCG database. The cohort was divided into three groups according to treatment strategy: LE alone; LE followed by TME (LE+TME); or upfront TME. LE was further subdivided into transanal (TEM/TAMIS) or endoscopic resection. Recurrence status was determined using a validated algorithm and through individual-level linkage of data from nationwide health registries. Cumulative incidence (CIF) of recurrence were reported in a competing risk model (death and 2nd primary cancer as competing events). The association between treatment strategy and recurrence was assessed using Cox proportional hazards regression and was reported as hazard ratios (HR) with 95% CI adjusted for age, sex, tumour budding, venous invasion, and tumour differentiation.
Results: 680 patients were included, of whom 319 (46.9%) were treated with LE alone, 130 (19.1%) with LE+TME and 231 (34.0%) with upfront TME. Patients treated with LE alone were associated with older age and higher Charlson Comorbidity Index score. Recurrence of any kind developed in 51 patients (7.5%) within 3 years of initial treatment. The 3-year CIF of recurrence ranged from 3.9% (95% CI: 1.4%-8.2%) in the LE+TME group, to 7.4% (95% CI: 4.5%-11.2%) in the upfront TME group, and up to 8.5% (95% CI: 5.7%-11.8%) in the LE alone group (p=0.2, Gray's Test). The rate of local recurrence was 0.8% (95% CI: 0.1%-3.9%) in the LE+TME group, increasing to 2.6% (95% CI: 1.1%-5.3%) for the upfront TME group and 5.3% (95% CI: 3.2-8.2%) in the LE group (p=0.037, Gray's Test). Transanal LE was associated with lower risks of recurrence compared to endoscopic LE (HR=0.45, 95% CI: 0.21-0.97, p=0.040).
Conclusion: Prior LE does not appear to compromise oncological outcomes in patients selected for completion TME. Transanal LE appears to improve outcomes compared with endoscopic LE, although selection of patients for completion TME remains a major challenge.

The OBANORES study: Obsidian in anastomotic healing after rectal cancer resection: A prospective clinical feasibility study

T. Valsamidis[1], K. Ljungmann[1], T.H. Avlund[1], S. Harsløf[1], C.B. Nørager[1], A. Tøttrup[1], L.H. Iversen[1]
[1]Aarhus University Hospital, Department of Surgery, Aarhus N, Denmark

Background: Anastomotic leakage following rectal cancer resection is a serious and frequent complication. Obsidian is a promising supplementary surgical closing technique after resection surgery in the gastrointestinal tract using an autologous fibrin matrix in combination with thrombocytes derived from the patient's own blood. Obsidian has not yet been tested thoroughly in the context of rectal anastomosis. This study aimed to assess the feasibility of Obsidian as a supplement in rectal anastomotic reinforcement in minimally invasive rectal cancer resection. Among others, secondary endpoints included the intraoperative outcome user friendliness and postoperative outcome anastomotic leakage rate.
Method: This prospective cohort study included 50 patients undergoing minimally invasive rectal cancer resection with anastomosis at Department of Surgery, Aarhus University Hospital. Successful use and application of Obsidian were assessed using a local predefined rating scale categorizing the application as 'Complete' (applied exactly in three pre-described steps), 'Almost Complete' (applied correctly in at least the first or the second of the three steps), and 'Incomplete' (all other applications). To rate the use of Obsidian as feasible, we required the application be rated as 'Complete' or 'Almost complete' in at least 90% of patients. Data pertaining to the secondary endpoints were collected during surgery and from patients' medical records.
Results: Obsidian application was rated as 'Complete' in 17 cases (34%) and as 'Almost Complete' in 33 cases (66%), thus complying with feasibility criteria in all (100%) patients. Difficulties reported in a 'Complete' application included material depletion, machine error, anatomical and time constraints. User friendliness was reported as `Easy` in 31 (65.96%) applications, and `Difficult, but can be performed` in 16 (34.04%). Anastomotic leakage occurred in 5 (10.6%) of the 47 patients.
Conclusion: Our study demonstrated successful, feasible application of Obsidian in all patients following minimally invasive rectal cancer surgery. However, further large-scale, multi-center randomized trials are needed to fully assess potential benefits for patient outcomes with use of Obsidian.

Days Alive and Out of Hospital at 90 days as a composite outcome measure in patients undergoing elective surgery for colorectal cancer in Denmark – a nationwide, observational study

K.B. Bräuner[1], M. Mashkoor[1], R. Peuliche Vogelsang[1], R. Dahlin Bojesen[1], A. Weinberger Rosen[1], I. Gögenur[1]
[1]Zealand University Hospital, Deparment of Surgery, Køge, Denmark

Background: Improvements in perioperative optimization and minimally invasive surgery has improved short-term postoperative survival to a degree, where there is an increasing interest in patient-centered and quality of life as outcomes for colorectal cancer (CRC) research. We aimed to investigate the validity of "days alive and out of hospital" at 90 days (DAOH-90) in a contemporary cohort of Danish patients with colorectal cancer undergoing elective surgery and its relationship with patient characteristics.
Method: Data on patients operated for CRC from April 2014 to April 2019 from the Danish Colorectal Cancer Group database and the Danish National Patient Register was gathered. DAOH-90 was analyzed using quantile regression for the 10^{th}, 25^{th}, 50^{th}, 75^{th}, and 90^{th} percentiles and the association between DAOH-90 and long-term postoperative mortality was analyzed using a Cox regression.
Results: 16,183 patients with CRC were included. The median DAOH-90 was 85 (IQR: 82-87) and the incidence of death within 90 days of surgery was 2.2 %. We found a significant association between DAOH-90 in the 25^{th}, 50^{th} and 75^{th} quantile and mortality between the 90th postoperative day (POD90) and POD365 ($p = 0.0008$, $p < 0.0001$, and $p < 0.0001$), and for death between POD90 and POD1825 (5 years after surgery) ($p = 0.0026$, $p < 0.0001$, and $p < 0.0001$). The quantile regression analysis showed that both medical and surgical complications were associated with significantly lower DAOH-90 for 10^{th}, 25^{th}, 50^{th}, 75^{th}, and 90^{th} percentile. A multivariable quantile regression was performed using a composite outcome for medical and surgical complications respectively as well as age, sex, American Society of Anesthesiology score, performance status, Charlson's comorbidity index and Union of International Cancer Control stage. We found that DAOH-90 10^{th} percentile was 78.6 days, 25^{th} percentile was 83, median was 86, 75^{th} percentile was 87, and 90^{th} percentile was 88 when adjusting for these variables witha drastic impact impact of severe complications and poor general health on the lowest percentiles, whereas complications generally affected the DAOH-90 less in higher percentiles.
Conclusion: We found that DAOH-90 was associated with a number of demographic and comorbidity related variables. Medical compilations, surgical complications, and poor performance status in particular had great impact on DAOH-90. DAOH-90 was also significantly associated with mortality at both 1 and 5 years after surgery.

Preliminary Results on Risk of Reoperation After Incision for Pilonidal Sinus Disease from 2010-2021 - A Danish Population-Based Cohort Study

I.K. Faurschou[1,2,3], R. Erichsen[1,2], S. Haas[1,3]
[1]Randers Regional hospital, Pilonidal Disease Center, Department of Surgery, Randers, Denmark, [2]Aarhus University Hospital, Department of Clinical Epidemiology, Aarhus N, Denmark, [3]Aarhus Universitet, Department of Clinical Medicine, Aarhus N, Denmark

Background: Pilonidal abscesses should be treated with lateral incision and drainage (I&D). This treatment leaves any midline manifestations untouched and thus a risk of recurrence. We aimed to determine the frequency of reoperations following I&D in pilonidal abscesses as initial treatment.
Method: This cohort study used data from nationwide Danish registries to identify patients with a pilonidal sinus disease (PSD) diagnosis code and a procedure code PSD I&D surgery as their initial PSD surgery from 2010-2021. The patients are hereafter followed until reoperation.
Results: We identified 8,975 patients. The median age was 24 years (IQR 19,31), and 64% were male. Thirty percent received a reoperation for PSD during follow-up. Of these, 62% had the reoperation within the first year. The types of reoperations included another incision (51%), pit-picking (15%), cleft lift surgery (9%), and surgical wound treatment (10%).
Conclusion: These preliminary results show that a high proportion of patients with abscess-forming pilonidal sinus disease are cured by I&D as initial treatment. If midline manifestations are minimal, patients should be informed of a 30% risk of recurrence and not necessarily undergo further follow-up. Additional results will come, identifying factors that influence the risk of reoperation.

Colon capsule endoscopy compared to conventional colonoscopy in patients with colonic diverticulitis (CACODI): a randomised controlled superiority trial

C. Thorndal[1], B. Schelde-Olesen[1,2], L. Kaalby[1,2], U. Deding[1,2], M. M. I. Thygesen[1], L. Østergaard Hansen[1], P. Vadgaard Andersen[1,2], A. Koulaouzidis[1,2], G. Baatrup[1,2], T. Bjørsum-Meyer[1,2]
[1]Odense University Hospital, Department of Surgery, Svendborg, Denmark, [2]University of Southern Denmark, Department of Clinical Research, Odense M, Denmark

Background: Follow-up colonoscopy after an episode with colonic diverticulitis (CD) is standard in the Danish healthcare system to exclude malignancy. The estimated prevalence of colorectal cancer (CRC) in patients with CD is 2% with a significantly larger prevalence in patients with complicated CD. Capsule endoscopy of the colon and rectum is an equal diagnostic alternative to colonoscopy, which has primarily been used for research perspectives in Denmark. The purpose of this study was to compare capsule endoscopy with colonoscopy after an episode with CD with the primary focus on patient-reported outcomes.
Method: A randomised controlled trial was conducted in patients with CT-verified CD from the Surgical Department and Emergency Department at Odense University Hospital. Patients were randomized to either capsule endoscopy (PillCAm Colon 2, Medtronic), or colonoscopy 4-6 weeks after discharge. Primary outcome was patient-reported discomfort and examination preference. The secondary outcomes were proportion of complete examinations, need for further examination and frequency of polyp and CRC findings.
Results: In total, 159 patients were included with 148 receiving their allocated intervention and 83 completed the questionnaires after endoscopy. Demographic data were comparable between the two intervention groups. No adverse events were observed for capsule endoscopy or colonoscopy. No significant difference in experienced physical and mental discomfort between capsule endoscopy and colonoscopy was found. We observed a significantly higher median Visual Analog Scale (VAS) score for expected physical and mental discomfort for colonoscopy, compared with capsule endoscopy. In case of a new event, 49% would prefer capsule endoscopy, 13% would prefer colonoscopy and the remaining 38% did not know which modality they would prefer. Among patients that had undergone both procedures, 36 % would prefer capsule endoscopy, while 43% would choose colonoscopy. Complete examinations were observed in 84% of capsule endosocopies and 92% of colonoscopies. There were polyp findings in 33% of patients receiving capsule endoscopy and 28% receiving colonscopy. Polyps were found in 11% receiving both examinations. No malignant lesions were found.
Conclusion: Capsule endoscopy is a safe procedure for follow-up in patients after an episode with CD and is prefered by the patients compared to colonoscopy. The proportion of complete capsule endoscopies is high, but need improvement to reach the same level as for colonscopy.

Can CRP predict anastomotic leakage after resection for colon cancer already 2 days post-surgery?

S. Sinimäki[1], C.L. Andersen[2,3], J. Nors[4], P. Bondeven[3,4], C. Janesch[5], U.S. Løve[6], L.H. Iversen[7], K.A. Gotschalck[1,3]
[1]Horsens Regional Hospital, Surgical Department, Horsens, Denmark, [2]Aarhus University Hospital, Dept. of Molecular Medicine, Aarhus N, Denmark, [3]Aarhus University, Dept. of Clinical Medicine, Aarhus N, Denmark, [4]Randers Regional

Hospital, Surgical Department, Randers, Denmark, [5]Gødstrup Hospital, Surgical Department, Gødstrup, Denmark, [6]Viborg Hospital, Surgical Department, Viborg, Denmark, [7]Aarhus University Hospital, Surgical Department, Aarhus N, Denmark

Background: A C-reactive protein (CRP) value <100mg/L (<1000 nmol/L) on postoperative day (POD) 3 is recommended as a marker to rule out anastomotic leakage (AL) after colon cancer resection. With increasing use of minimally invasive techniques and Enhance Recovery After Surgery protocols patients may be discharged before POD3. The aim of our study was to evaluate the predictive value of CRP for AL on POD2.
Method: We performed a cross-sectional study including patients with curative intended resection for colon cancer between June 2018 and June 2021 at 4 surgical departments in Denmark. We included patients with CRP measured at POD2 and without AL diagnosed on POD1. Risk of AL was evaluated according to a CRP cut-off value on POD2 of 100mg/L. In addition, receiver operating characteristic (ROC) curve with estimation of area under ROC-curve was generated to evaluate the diagnostic performance of an estimated optimal cut-off value of CRP on POD2. We validated the 100mg/L CRP cut-off using data from an independent cohort with patients from 3 other surgical departments in Denmark included within the same timeframe.
Results: A total of 401 patients underwent open (n=79, 20%), or minimal invasive resection (n=322, 80%) for colon cancer. AL was diagnosed in 16 (4.0%) patients a median of 3 (2-8) days after surgery. Among 161 (40%) patients with CRP >100mg/L on POD2, 8,1% had AL, compared to 240 (60%) patients with CRP <100mg/L on POD2 where only 1.3% had AL. The negative predictive value for AL with CRP <100mg/L on POD2 was 98.8% (95%CI: 96.4-99.7%) with sensitivity 81.2% (95%CI:54.4.1-96.08%) and specificity 61.3% (95%CI:56.5-66.4%). The area under the ROC-curve was 0.81 at an estimated optimal CRP cut-off point on POD2 of 141mg/L; At this cut-point sensitivity was 80% and specificity 79% for AL.
In an independent, comparable patient population of 213 patients, AL was diagnosed in 12 (5,6%) patients. Among 114 (53,5%) patients with CRP > 100mg/L on POD 2, 9,6% had AL. Compared to 99 (46,4%) patients with CRP < 100mg/L on POD 2 where only 1,0% had AL.
Conclusion: A CRP value below 100 mg/L on POD2 was associated with very low risk of AL. It can be helpful in selecting patients for discharge on POD2, thereby decreasing length of stay.

Evaluation of systemic inflammation-based modified Glasgow Prognostic score in colorectal cancer patients undergoing curative intended surgery.

S. Eraslan[1], A. Weinberger Rosen[1], I. Ose[1], A. Orhan[1], H. Yikilmaz Pardes[1], I. Gögenur[1,1]
[1]Zealand University Hospital, Surgery, Koege, Denmark

Background: Colorectal cancer (CRC) is ranking among the leading cause of cancer-related mortality. Despite surgical and oncological treatments, accurate prognosis remains a challenge for colorectal cancer patients undergoing curative-intent cancer surgery. The modified Glasgow Prognostic score (mGPS) has shown promising prognostic results across various malignancies. The current study sought to investigate the prognostic value of modified Glasgow Prognostic score in postoperative clinical outcomes in patients with CRC.
Method: In this retrospective cohort study, we included patients who underwent surgery for CRC with curative intend at the Department of Surgery at Zealand University Hospital, Køge in Denmark between the 1st 2020, and January the 31st, 2023. The modified Glasgow Prognostic Score was calculated for all patients using medical records and laboratory blood test result of preoperative CRP and albumin. The Kruskal–Walli's test was used to test for statistical difference in between the modified Glasgow Prognostic Score and the number of medical complications, Comprehensive Complication Index (CCI), the number of readmissions, and days alive and out of hospital (DAOH).
Results: In total, 809 patients were included. mGPS 0 was recorded in 450 patients, mGPS 1 was identified in 25 patients, mGPS 2 was found in 124 patients, whereas mGPS was unknown in 210 patients. Mean DAOH for each group was as follows: mGPS 0 = 25.45, mGPS 1 = 25.96, mGPS 2 = 24.29 and mGPS unknown = 26.07 whereas mean CCI for each group was: mGPS 0 = 9.04, mGPS 1 = 9.31, mGPS 2 = 11.61 and mGPS unknown = 7.39. The distribution was statistically different between mGPS and CCI ($p = 0.019$) and between mGPS and DAOH ($p = 0.002$). No difference was found between mGPS and number of readmissions and the number of medical complications ($p = 0.417$, $p = 0.418$, respectively).
Conclusion: Modified Glasgow Prognostic Score may serve as a useful prognostic tool for predicting postoperative CCI and days alive out of hospital in patients with colorectal cancer undergoing curative-intent elective surgery.

Kolorektalcancer i Grønland- en opgørelse fra 2015-2020

A.-M. Lawaetz[1], A.K. Buch[1], S.O. Bernth-Andersen[1], T. Mynster[2,1]
[1]Dronning Ingrids Hospital, Kirurgisk Afdeling, Nuuk, Greenland, Denmark, [2]Bispebjerg Hospital, Kirurgisk Afdeling, København, Denmark

Background: Der foreligger udførlige data ved DCCGs årsopgørelser på den hyppige incidens af kolorektalcancer (KRC) i DK. KRC er ligeledes en hyppig kræftform i Grønland, men der foreligger ikke de samme grundige opgørelser.
Indført elektronisk journalsystem gør det muligt at opspore alle behandlede patienter med KRC siden 2014 med inklusion af

data fra patologidatabasen i DK. Formålet var at belyse incidensen af KRC i Grønland, og opgøre populationens demografi og behandling sammenlignet med danske og internationale forhold.
Method: Opgørelsen er et retrospektivt registerstudie. Patienter (pt) med KRC første gang diagnosticeret i 2015-2020 blev opsøgt. Data blev indsamlet fra journaloplysninger inklusiv CT-beskrivelser, og Patobank-data. Alle oplysninger om overlevelse og recidiv-udvikling er ajourført indtil 30.8.2024.
Results: 237 pt blev nydiagnosticeret med KRC i 2015-2020. Mænd udgjorde 52%, gennemsnitsalderen var 64 år. 73% af populationen var bosat uden for hovedstaden Nuuk. ASA-fordelings% var (I-IV) 11;62;25;2. Performance score 0 sås hos 76%. Akut operation skete for 17%. Operation blev udført i DK i 34% af tilfældene. Rektumcancer udgjorde 29%. Ingen tumorresektion skete for 14% pga. avanceret sygdom. UICC-stadie I, II, III, IV-fordelings% var 11;18;34;36.
Radikalitet for elektive resektioner: R0/1 var 75/25% for kolon og 78/22% for rektum.
Glandelhøst for elektive resektioner var median 18 for kolon og 23 for rektum. Anastomoselækagefrekvensen var for kolon 2,4% og for rektum 32%
Adjuverende kemoterapi blev givet til 82% af pt under 80 år med stadium III.
90-dages-mortaliteten var for kolon 2,5%, og for rektum 2,1%. 5-årsoverlevelsen for kolon var 43% og for rektum 47%, uden signifikant forskel for køn eller bopæl. For elektivt resecerede pt var 5-års overlevelse 49% for kolon og 68% for rektum.
Conclusion: Incidens af KRC i Grønland er lig den i DK, men pt er yngre end danske, og har til trods en dårligere overlevelse. Årsagen kunne være en generel dårligere overlevelse og i særdeleshed dårligere stadie ved diagnose. Kvaliteten af kirurgi er også påvirket af dette forhold. De logistiske udfordringer mht. udredning og behandling for pt bosat uden for Nuuk synes ikke at påvirke overlevelsen.

Comprehensive Geriatric Assessment for high-risk colorectal cancer patients scheduled for surgery

A. Righult[1], H. Yikilmaz Pardes[1], I. Ose[1], I. Gögenur[1]
[1]Zealand University Hospital, Department of Surgery, Køge, Denmark

Background: Frailty, frequently underdiagnosed in surgical settings, is a significant contributor to increased postoperative morbidity and mortality. We explored effectiveness of a machine learning based algorithm for stratifying patients to different risk groups based on 1-year mortality and based on this prediction, preoperative geriatric assessment before surgery for colorectal cancer surgery.
Method: Individual risk assessment utilizing an AI-based prediction model was implemented in February 2023. Patients were stratified according to predicted risk of 1-year mortality, and further assessed using a Geriatric 8 questionnaire. Patients with a predicted risk of 1-year mortality between 5-15% and a G8 ≤14, as well as all patients with predicted risk of 1-year mortality above 15%, were referred to a geriatric outpatient clinic for a comprehensive geriatric assessment before surgery. Measures taken included assessment of comorbidity through CIRS-G, level of functional ability through KATZ ADL, cognition through Mini-Cog score, and adjustments in medications.
Results: A total of 46 patients underwent comprehensive geriatric assessment between February 2023 and August 2024. The mean CIRS-G score was 12.04, suggesting a notable level of comorbidity. The mean KATZ ADL score was 5.75 indicating a good level of functional ability, while the mean Mini-Cog score was 3.85 revealing a moderate risk of cognitive impairment. There were 27 changes in patients' medications, and 15 medications were discontinued.
Conclusion: Allocation of patients to Comprehensive geriatric assessment through an AI-model is feasible and results in the expected action points including change of medications, and other optimizations before surgery.

Time of recurrence following cytoreductive surgery and hyperthermic intraperitoneal chemotherapy for peritoneal metastases of colorectal origin: Risk factors and prognosis

M.F. Nielsen[1], S. Ravn[1], M.M. Sørensen[1], J.A. Funder[1,2], L.H. Iversen[1,2]
[1]Aarhus University Hospital, Department of Surgery, Aarhus N, Denmark, [2]Aarhus University, Department of Clinical Medicine, Aarhus N, Denmark

Background: Cytoreductive surgery (CRS) combined with hyperthermic intraperitoneal chemotherapy (HIPEC) has significantly improved the 5-year survival in patients with colorectal cancer (CRC) and peritoneal metastases (PM). However, recurrence remains an important challenge, affecting approximately 80% of these patients. We aimed to characterize patients with early and late recurrence defined as recurrence diagnosed ≤ 6 months vs. >6 months after CRS+HIPEC. Moreover, to identify risk factors for early recurrence and their impact on post-recurrence survival (PRS).
Method: From June 2006 to December 2020, a prospective cohort included 310 patients with CRC and PM undergoing CRS+HIPEC at Aarhus University Hospital, Denmark. Follow-up was made at 3, 6, 12, 18, and 24 months, along with assessments at 3, 4, and 5 years after surgery. Data were retrieved from a local database with prospective data. In case of missing data, information was retrieved from electronic health records. Recurrence was defined as relapse of disease by recurrence of PM, liver or lung metastases or other extraperitoneal metastases.
Results: After a median 10.3 months follow-up, 247/310 (79.7%) patients experienced recurrence; 65 patients (26.3%) experienced early recurrence ≤ 6 months whereas 182 patients (73.7%) experienced late recurrence >6 months after

CRS+HIPEC. We found peritoneal cancer index (PCI) to be an independent risk factor for early recurrence, while postoperative systemic chemotherapy was associated with reduced risk of early recurrence. Patients with early recurrence had a significantly decreased median PRS of 16.8 months (12.1; 22.0) compared to 24.3 months (21.4; 28.3) for those with late recurrence (p=0.03).
Conclusion: Our findings underscore the importance of considering risk factors, particularly PCI score, in managing CRC PM. This highlights the role of postoperative chemotherapy in reducing early recurrence risk in patients undergoing CRS+HIPEC.

Safety and Feasibility of Same-Day Discharge After Loop Ileostomy Reversal? A Retrospective Analysis

M. Ladegaard Marcussen[1], M.-B. Worm Ørntoft[1,2,3], C. Jaensch[1,2,3]
[1]Gødstrup, Department of Surgery, Herning, Denmark, [2]Gødstrup, Centre for Research and Education, Herning, Denmark, [3]Aarhus, Department of Clinical Medicine, Aarhus, Denmark

Background: Reversal of loop ileostomy is a common surgical procedure, yet the optimal postoperative managementregimen, including the possibility of same-day discharge, remains uncertain. The aim of this study was to evaluate the outcomes of patients who underwent reversal of loop ileostomy, with a focus on complication, early discharge, and readmissions, to identify specific patient groups that could safely be offered same-day surgery.
Method: This retrospective study included all patients who had their loop ileostomy reversed at Department of Surgery Gødstrup between 01-01-2019 to 01-10-2023, identified by surgical procedure code. Data was collected from electronic patient records, including patient demographics as e.g., age, BMI, ASA score, and comorbidities. Further, duration of surgery, the surgeon level of expertise, postoperative complications, and readmissions were recorded. Descriptive statistical analyses and logistic regressions were conducted to evaluate associations between patient characteristics, surgical characteristics and outcomes.
Results: In the study period, 174 patients had their intestinal continuity restored. Their median age was 64.1 years, their median BMI was 25.2, and the majority had a stoma due to colorectal cancer surgery. The median hospitalization time was 1.1 days and time to first bowel movement was median 0.8 days. After discharge, 6/36 patients were readmitted with medical complications (4 with Clavien Dindo grade 3 or higher), and 23/36 patients had surgical complications (15 with CD 3 or higher), of which ileus was the predominant (74%). Three patients had anastomosis leakage (1.7%). Demographic and surgical characteristics associated with surgical complications and readmission were higher ASA score and age.
Conclusion: Same-day discharge after loop ileostomy reversal will be feasible and safe for a selected group of patients with ASA score below 3 and higher patient age seems to increase risk for complications and readmission, although a cut-of can be defined. The use of same-day surgery for this patient group could enhance patient care through increased flexibility, optimizing resource utilization and reducing hospital burden.

2.1 Hepatopancreaticobilliary (HPB)

Crucial biomolecular mechanisms for preventing post-hepatectomy liver failure

A. Lund[1], M.T. Thomsen[2], J. Kirkegård[1], J.R. Nyengaard[2], F.V. Mortensen[1]
[1]Aarhus University Hospital, Department of Surgery, Aarhus N, Denmark, [2]Aarhus University Hospital, Core Center for Molecular Morphology, Section for Stereology and Microscopy, Aarhus N, Denmark

Background: Post-hepatectomy liver failure remains the primary limitation in the surgical treatment of widespread liver malignancies. The rat model of 90% partial hepatectomy (PH) is well-established as a post-hepatectomy liver failure model, characterised by high mortality. This study aimed to investigate the biomolecular mechanisms during the early postoperative period in rats that successfully recover from major PH. Such knowledge has the potential to identify therapeutic targets that could improve outcomes following major PH.
Method: Rats were randomised to either 90% PH or sham surgery. Further randomisation was performed according to euthanisation time, either 12, 24, or 48h after surgery. A scoring system was employed to differentiate recovering PH-rats from those succumbing to post-hepatectomy liver failure. Proteomics was used to assess protein expression profiles and identify alterations in regulated biological pathways in recovering PH-rats compared to shams at each time point.
Results: Within the first 12h post-surgery, PH-rats exhibited a pronounced acute phase response, marked by significant activation of the innate immune system ($p<0.0001$), along with upregulation of proteins involved in inflammatory processes ($p<0.0001$) and protection against tissue injury ($p<0.0001$). Moreover, pathways related to blood coagulation ($p<0.0001$) and angiogenesis ($p<0.01$) were increased. At 24h, a significant regulation of proteins linked to apoptotic signalling pathways was observed ($p<0.007$). By 48h, a notable increase in proteins related to RNA metabolic processes ($p<0.001$) and proliferative pathways ($p<0.02$) was demonstrated.
Conclusion: Major PH triggers an immediate inflammatory response, alters blood coagulation, and stimulates the formation of new blood vessels. Following the onset of the acute phase response, the liver must effectively regulate apoptosis to

facilitate recovery. Successfully navigating this critical phase is crucial for maintaining metabolic homeostasis and initiating liver regeneration.

Incremental Value of Routine Magnetic Resonance Imaging in Patients with Resectable Pancreatic Cancer: A Nationwide Prospective Clinical Study.

J. Kirkegård[1], K. Sivesgaard[2], C.P. Hansen[3], E. Fallentin[4], M. Stender[5], C.W. Fristrup[6], L.P. Larsen[2], F.V. Mortensen[1]
[1]Aarhus University Hospital, Department of Surgery, HPB Section, Aarhus N, Denmark, [2]Aarhus University Hospital, Department of Radiology, Aarhus N, Denmark, [3]Rigshospitalet, Department of Gastrointestinal Surgery and Transplantation, København Ø, Denmark, [4]Rigshospitalet, Department of Radiology, København Ø, Denmark, [5]Aalborg University Hospital, Department of Surgery, Aalborg C, Denmark, [6]Odense University Hospital, Department of Surgery, Odense C, Denmark

Background: Surgery is the only chance for cure for patients with pancreatic cancer, but preoperative assessment of resectability is difficult. Around 20% of all patients scheduled for surgery are found to be unresectable during surgery. CT scan is the gold standard for the diagnostic workup of patients with suspected pancreatic cancer. However, MRI seem to be superior to CT in detecting liver metastases. In the present study, we aimed to examine the incremental value of using routine liver MRI before pancreatic cancer surgery to detect liver metastases not seen on CT.
Method: We conducted a prospective clinical study. All patients aged 18+ planned for curative-intent resection for pancreatic adenocarcinoma at the local multidisciplinary team (MDT) board were eligible for inclusion. Exclusion criteria were MRI with liver-specific contrast performed during diagnostic workup, neoadjuvant chemotherapy, or unable to undergo MRI. All participants underwent MRI of the liver with liver-specific contrast. If more than 14 days elapsed between the CT assessed at the MDT and the MRI scan, an updated CT of the abdomen was performed. The MRI scans were assessed locally by a radiologist with special expertise in MR of the liver. A total of 200 patients is scheduled for inclusion.
Results: 64 participants are enrolled and have undergone MR scan. Median age was 70 years (IQR: 64-75), and 59% were men. 46 (71.9%) had an updated CT performed. Of the 64 participants included, 6 (9.4%) had a change in preoperative treatment strategy from curative-intent resection to palliative (n=5) or downstaging (n=1) treatment. Of the 6 participants with a change in treatment strategy, 4 (6.3%) were due to liver metastases on MRI, 1 (1.5%) due to tumor growth on the updated CT, and 1 (1.5%) due to findings on a PET-CT performed outside the study protocol.
Conclusion: Among patients scheduled for curative-intent resection for pancreatic adenocarcinoma, routine liver MR in all patients conferred a change in treatment strategy in 6% of patients. This number increased to 9% with use of both liver MRI and updated CT of the abdomen, underlining the importance of updated imaging materials before surgical treatment. Inclusion is still ongoing, and survival analyses are awaited.

Piperacillin concentrations in bile and plasma in patients undergoing ERCP

L. Lerche Pontoppidan[1], J.B. Pedersen[2], M. Bue[3], P.E. Hanberg[4], K.C. Houlind[5], A. Riegels Knudsen[6]
[1]Sygehus Lillebælt, Organkirurgisk afd., Kolding, Denmark, [2]Aalborg Universitetshospital, Mave- og Tarmkirurgisk Afdeling, Aalborg, Denmark, [3]Aarhus Universitetshospital, Ortopædkirurgisk afd., Aarhus, Denmark, [4]Aalborg Universitetshospital, Øre-næse-halskirurgisk afd., Aalborg, Denmark, [5]Sygehus Lillebælt, Karkirurgisk afd., Kolding, Denmark, [6]Aarhus Universitetshospital, Mave-Tarmkirurgisk afd., Aarhus, Denmark

Background: **Background:** Surgical procedures involving the biliary system are associated with up to a 25% risk of developing a surgical site infection, contingent upon the specific procedure and the patient's overall condition. For effective antibiotic prophylaxis, it is advisable to select an antibiotic that achieves high concentrations in both the bile and the biliary tissue. Prior research has demonstrated that piperacillin/tazobactam (pip/tazo) notably decreases the incidence of surgical site infections in biliary system procedures. In a recent porcine study, we found that piperacillin levels in bile were ten times higher than in plasma and remained elevated throughout an 8-hour dosing interval. To assess the clinical relevance of these findings, we aimed to quantify piperacillin concentrations in bile and plasma in patients undergoing ERCP.
Method: **Method:** Ninety-nine patients undergoing ERCP were included. Upon arrival at the department, each patient received a single bolus of pip/tazo 4/0.5 g. The interval between administration and the performance of the ERCP varied among patients. During the ERCP procedure, one bile sample and one blood sample were simultaneously collected. The piperacillin concentration was determined using ultra high-performance liquid chromatography.
Results: **Results:** The interval between the administration of pip/tazo and sample collection ranged from 4 to 245 minutes. The mean piperacillin concentrations in bile exceeded those in plasma. The peak concentrations observed were 2864 µg/mL in bile and 376 µg/mL in plasma. Additionally, elevated plasma bilirubin levels (>100 µmol/L) were found to have a negative correlation with piperacillin concentrations in bile.
Conclusion: **Conclusion:** Piperacillin achieved high concentrations in bile, suggesting its potential effectiveness as an antibiotic prophylaxis choice for surgical procedures involving the biliary system. However, the delivery of piperacillin to the bile seems to be impaired in cases of common bile duct obstruction.

Preoperative factors predicting outcomes in patients with suspected perihilar cholangiocarcinoma referred for curative resection— a single-center 10-year experience

H. Ahmad Al-Saffar[1], P. Nørrgaard Larsen[1], N. Agaard Schultz[1], L. Knøfler[1], D. Ramirez[1], T. Skårup Kristensen[2], H.-C. Pommergaard[1]
[1]Rigshospitalet, Department of Surgery and Transplantation, Centre for Cancer and Organ Diseases, Copenhagen, Denmark, [2]Rigshospitalet, Department of Radiology, Copenhagen, Denmark

Background: Perihilar cholangiocarcinoma (pCCA) is a rare malignancy requiring resection of extrahepatic bile ducts with or without hepatectomy, for radicality. Prognostic models for postoperative outcomes in pCCA are unusable in preoperative decision-making as most are based on postoperative variables. Few consider non-resectability as an outcome despite rates of up to 30 %. Also, rates of major surgical complications (Clavien-Dindo (CD) grade ≥3a) and 90-day mortality of 48 and 15 %, have been reported. We investigated preoperative predictive factors for CD≥3a, non-resectability, disease-free survival (DFS), and overall survival (OS), in patients referred for resection of pCCA.
Method: Patients with suspected pCCA evaluated at multidisciplinary team (MDT) conference and referred for curative resection at Rigshospitalet, from 2013-2023. All were identified from the Danish Liver Cancer Group (DLGCD). Patients were evaluated, starting from date of first MDT for suspected pCCA; and starting from date of surgery if proven pCCA. Outcomes were preoperative factors related to OS, DFS, non-resectability and CD≥3a
Results: Ninety-three patients with suspected pCCA were considered resectable at first MDT, of which 74 (79.5 %) were resected. In resected patients (n=65 [87.8 %]) had pCCA, 2 (2.1 %) had gallbladder cancer (GBC) and 7 (7.5 %) had BHS. Non-resected patients (n=19 [20.4%]) had higher preoperative p-bilirubin and performance status score >0 (PS >0) compared to resected pCCA and BHS (p=0.02 and 0.01, respectively). Portal vein embolization and PS >0 were associated with worse OS (p <0.001 and 0.003, respectively). No preoperative factors were independently associated with non-resectability, CD≥3a, DFS or BHS
Conclusion: PS >0 and PVE were associated with worse survival in patients with suspected pCCA. Non-resected patients had higher frequency of PS >0 and elevated p-bilirubin compared to resected pCCA and BHS

Postoperative Factors Predicting Outcomes in Patients with Perihilar Cholangiocarcinoma Undergoing Curative Resection— A 10-year Single-Center Experience

H. Ahmad Al-Saffar[1], N. Agaard Schultz[1], P. Nørrgaard Larsen[1], E. Fallentin[2], L. Knøfler[1], D. Ramirez[1], H.-C. Pommergaard[1]
[1]Rigshospitalet, Department of Surgery and Transplantation, Centre for Cancer and Organ Diseases, Copenhagen, Denmark, [2]Rigshospitalet, Department of Radiology, Copenhagen, Denmark

Background: Biliary tract carcinoma (BTC) is a rare malignancy with perihilar cholangiocarcinoma (pCCA) accounting for 50-70 % of cases. Resection of extrahepatic bile ducts with or without hepatectomy is required for radicality. Overall 5-year survival following resection ranges from 10-40 % due to early recurrence. However, existing prognostic models for postoperative outcomes in pCCA are limited by long study timespan with variations in preoperative work-up, surgical approach and histopathological interpretation. We investigated prognostic postoperative risk factor in patients resected for pCCA in a high-volume center with standardized work-up and surgical treatment
Method: We included patients with confirmed pCCA undergoing curative resection at Rigshospitalet, from 2013-2023. All were identified from the Danish Liver Cancer Group (DLGCD). Patients were evaluated starting from date of surgery to date of death or last follow-up. Cox-regression investigated association between postoperative factors and overall survival as well as disease-free survival
Results: A total of 93 patients were considered to have resectable pCCA at multidisciplinary team (MDT) conference. Of these, 65 patients were resected with curative intent and histologically confirmed PHCC. Of these, 4 (6.1 %) died within 90 days after surgery. Median OS was 36.2 months; The 1-, 3- and 5-year OS rates were 95.0, 54.0 and 16.3 % respectively. Median DFS was 22.5 months; The 1-, 3- and 5-year DFS rates were 69.2, 30.7 and 10.7 %, respectively. Liver failure grade ≥B (HR 1.06 (CI 1.00-1.75), p=0.01) and N1-resection (HR 1.17 (CI 1.05-1.63), p=0.001) were independently associated with OS. T-stage >2 (HR 1.47 (CI 1.16, 2.66), p=0.04) was the only independent variable associated with DFS. The 5-year OS for N0 patients was 21.0 % compared to 8.6 % in patients with N+ (p=0.004). The 5-year DFS for patients with T >2 was 0 % compared to 13.2 % in patients with T ≤2 (p=0.007)
Conclusion: Postoperative liver failure grade ≥B, N1-resection and advanced T-stage are associated with worse prognosis in resected pCCA. Research are needed to improve pre-operative detection of these features

Accelerated *vs* Step-Up Endoscopic Treatment for Large Pancreatic Walled-Off Necrosis: Interim Analysis of a single-center randomized trial (ACCELERATE trial)

G.A. Olsen[1], S. Novovic[1,2], A. Hadi[1], A.P. Prahm[1], M.P. Werge[1], E.F. Hansen[1], D.F. Schefte[1], M.L. Lauritsen[1,2], P.N. Schmidt[1], J.G. Karstensen[1,2]

[1]Copenhagen University Hospital - Amager and Hvidovre, Pancreatitis Centre East, Gastro Unit, Hvidovre, Denmark, [2]University of Copenhagen, Department of Clinical Medicine, Copenhagen, Denmark

Background: Endoscopic step-up approach with endoscopic ultrasound guided transmural drainage followed by, if necessary, endoscopic necrosectomy, has become gold standard for treating pancreatic walled-off necrosis (WON). We hypothesize that an accelerated treatment algorithm for patients with large WON could reduce hospital length of stay (LOS) and decrease the incidence of major complications.
Method: This single-center, open-label, randomized controlled superiority trial enrolled patients with WON with a diameter > 15 cm, who were assigned to either an accelerated or conventional step-up treatment algorithm. Both groups underwent transgastric drainage with a 20 mm lumen-apposing metal stent. In the accelerated group, necrosectomy was performed during the index procedure and continued as needed until the WON cavity was cleared of necrotic tissue. In the step-up group, endoscopic necrosectomy or additional drainage was only performed if clinical improvement was not observed. The primary endpoint was a composite of death during treatment, major complications, and LOS exceeding 58 days from the index procedure. The endpoint of LOS exceeding 58 days was chosen based on a recent trial performed at our center, which found a median LOS in comparable patients to be 58 days. Secondary outcomes included mortality, major complications, and LOS.
Results: A total of 25 patients were included in this interim analysis: 12 in the accelerated group and 13 in the step-up group. The groups were comparable in baseline characteristics and WON size, with an overall median diameter of 21.7 cm [interquartile range (IQR) 18.0-25.0]. The primary composite outcome occurred in 1 of 12 patients (8.3%) in the accelerated group and in 8 of 13 patients (61.5%) in the step-up group (odds ratio (OR) 0.057; p = 0.011). One patient in the step-up group died because of hemorrhage. Major complications were significantly lower in the accelerated group (0.0% vs. 46.2%; p = 0.015). In the step-up group, the first encountered major complication occurred a median of 36 days [IQR 19-41.8] after initial drainage. The median LOS was significantly shorter in the accelerated group (32.5 days [IQR 17.5-38.2] vs. 68.5 days [IQR 35.5-97.8], p = 0.039).
Conclusion: An accelerated treatment algorithm seems to reduce both the rate of major complications and the LOS compared to a conventional step-up approach, suggesting that a more aggressive treatment approach is preferable in patients with large symptomatic WON.

Laparoscopic Ablation for Liver Malignancies - Initial Experience at a Scandinavian High Volume HPB Center

J. Klubien[1], L.A. Knøfler[1], P.N. Larsen[1], S.D. Nielsen[2], D. Fukumori[1], J.G. Hillingsø[1], C. Tschuor[1], H.-C. Pommergaard[1]
[1]Rigshospitalet, Department of Surgery and Transplantation, Copenhagen, Denmark, [2]Rigshospitalet, Department of Infectious Diseases, Copenhagen, Denmark

Background: Ablation is an effective, parenchymal-sparing treatment for primary liver cancer and liver metastases. The purpose of this study was to report our initial experience with laparoscopic microwave ablation regarding postoperative complications, rate of conversions to open procedure, and technical efficacy.
Method: This was a quality improvement project carried out at a tertiary care center in Denmark. Patients ≥18 years old with liver malignancies, not available for percutaneous ablation, and treated with ultrasound-guided laparoscopic ablation were included.
Results: From March 2023 to December 2023, 39 patients were referred for laparoscopic ablation. Of these, two procedures were converted to open procedure due to adhesion and tumor progression. Three patients rejected sharing of medical information, two procedures were cancelled and in one case the strategy was changed perioperatively. Therefore, 32 procedures in 31 patients were available for analysis. Complete ablation was achieved in 100% of the procedures. None of the patients died, and in 21 cases (65.6%) no complications were reported. The majority had a grade 1 complication based on the Clavien-Dindo classification. Two patients had a complication grade 2 and one had a grade 4b. The median Comprehensive Complication Index was 12.2 (interquartile range 8.7-24.2). Furthermore, univariable logistic regression showed that ≥2 tumors treated was associated with a higher risk of complications (odds ratio 6.37, 95% confidence interval [1.20;33.85], p-value =0.0297).
Conclusion: Ultrasound-guided laparoscopic microwave ablation of liver malignancies is feasible and safe with little risk for complications, a high technical efficacy, and a low rate of conversions to open procedure.

2.2 Oesophagogastric (ECV)

Patterns of complications after minimally invasive oesophagectomy compared to open surgery – a retrospective single centre cohort study

T. Kirkegaard Holtz[1], L. Lerche Pontoppidan[1], J. Sanberg[2]
[1]Sygehus Lilbælt, Surgical Department, Kolding, Denmark, [2]Odense Universitetshospital, Surgical Department, Odense, Denmark

Background: Oesophageal cancer is the seventh most frequent type of cancer worldwide. Oesophagectomy is the gold standard for curative intended treatment and can be performed with either an open (OE) or a minimally invasive (MIE) technique. However, overall postoperative complication rates after oesophagectomy are up to 60%. This study investigates the occurrence and severity of complications after curative intended oesophagectomy comparing OE with MIE in a single high-volume Danish surgical center.
Method: The study included all patients undergoing curative-intended oesophagectomy due to oesophageal cancer from 2012-2022 at the Department of Surgery, Odense University Hospital. Data from electronic patient records were collected retrospectively and analyzed. The primary outcome was the frequency of complications within 30 days, as defined by The Esophageal Complications Consensus Group, including severity, as defined by Clavien-Dindo. Secondary outcomes were 30- and 90-day mortality and radicality of resection. Contingency tables for patient demography, perioperative data, and occurrence of postoperative complications by surgical approach were compared using the Chi2/Mann-Whitney-U/t-test where appropriate. Multiple logistic regression analysis was performed with any complication as the dependent variable and surgical approach as the independent variable, adjusted for age, WHO performance status, ASA and perioperative conversion.
Results: The study included 592 patients. 191 patients underwent OE, whereas 401 patients underwent MIE. The overall complication rate was 48.3%, with no significant difference between the two groups. Complications to OE had a significantly higher Clavien-Dindo score (p=0.015).
Anastomotic leaks occurred in 18.3% of the OE group and 11.7% of the MIE group (p=0.030). The MIE group had a significantly higher incidence of type II leaks, while type III leaks were more frequent in the OE group (p=0.046).There was no significant difference between groups regarding 30- and 90-day mortality and radicality of resection. Regression analysis did not find a surgical approach to be associated with the occurrence of complications (OR 1,17, 95% CI: 0.79-1.75, p=0.43). However, conversion to open surgery was a predictor of complications (OR 2.31, 95% CI: 1.05-4.30, p=0.035).
Conclusion: There were no differences in the occurrence of complications after oesophagectomy when comparing OE and MIE. However, open surgery yielded more anastomotic leaks and complications of a higher severity.

Stage-dependent survival in Esophageal Cancer: A Danish nationwide cohort study

O. Nørholm Kempf[1], M. Achiam[1], N. Nerup[1], J. Sanberg[2], L. Bæksgaard Jensen[3], D. W. Kjær[4], S. Dikinis[5], M. Siemsen[3], L. Bech Jellesmark Thorsen[6], M. Stenger[7], L. Møller[8]
[1]Rigshospitalet, Department of Transplantation and Digestive Diseases, Copenhagen, Denmark, [2]Odense University Hospital, Department of Surgery, Odense, Denmark, [3]Rigshospitalet, Department of oncology, Copenhagen, Denmark, [4]Aarhus University Hospital, Department of Surgery, Aarhus, Denmark, [5]Aalborg University Hospital, Department of Gastrointestinal Surgery, Aalborg, Denmark, [6]Aarhus University Hospital, Department of Oncology, Aarhus, Denmark, [7]Odense University Hospital, Department of Thoracic- Cardiac and Vascular Surgery, Odense, Denmark, [8]Aalborg University Hospital, Department of Department of Cardiovascular Surgery, Aalborg, Denmark

Background: Esophageal cancer ranks among the top ten most prevalent cancers worldwide, with Denmark experiencing over 800 new cases annually and a five-year survival rate as low as 10-15%. Despite treatment advancements, prognostic accuracy remains challenging. This study aims to utilise the widely adopted Union for International Cancer Control staging system to map esophageal cancer survival across stages and treatment regimens.
Method: Between January 2013 and December 2021 7,855 esophageal cancers were registered in the Danish Esophagogastric Cancer group database, covering 99 % of all Danish esophageal cancers since 2012. Patients were stratified by treatment approach and histological type and staged according to the UICC TNM classification. All-cause mortality from diagnosis served as the endpoint, with follow-up until September 12, 2023. Statistical analyses included Kaplan-Meier methods and Cox proportional hazards regression.
Results: Definitive chemoradiotherapy showed lower overall survival (OS) compared with curative treatment($p<0.001$), yet significantly higher than palliative treatment ($p<0.001$). Among patients receiving curative treatment for squamous cell carcinoma (SCC), no significant differences in unadjusted OS between stages were observed *($p=0.25$).* As anticipated, intended curative-treated patients exhibited increased OS compared with those receiving palliative care. Notably, a highly selected group of patients with Stage IVb disease who underwent curative treatment demonstrated unexpectedly high OS rates.
Conclusion: Our examination of one of the most elaborate databases resulted in a detailed overview of esophageal cancer survival outcomes. By mapping survival stratified by tumour stage and treatment status based on Danish treatment protocols, we hope to aid clinical decision-making for more individualized treatment protocols.

The OR staff's perception of disruptions in workflow during robotic-assisted surgery – A Qualitative study.

A. Schucany[1], B. Bruun[2], A.M. Nielsen[3], T. Grantcharov[4], J. Strandbygaard[5], M. Achiam[1]
[1]Rigshospitalet, Department of Transplantation and Digestive Diseases, Copenhagen, Denmark, [2]Herlev Hospital, Copenhagen Academy for Medical Education and Simulation, CAMES, Copenhagen, Denmark, [3]Rigshospitalet, Department of Anesthesiology, Copenhagen, Denmark, [4]Stanford University, Department of Surgery, Clinical Excellence Research Center, Stanford, California, United States, [5]Rigshospitalet, Department of Gynecology, Fertility and Obstetrics, Copenhagen, Denmark

Background: Robotic-assisted surgery introduces complex new technology into the operating room (OR), thereby new communication and workflow challenges. Investigating surgical staff perspectives on workflow disruptions in the OR is crucial for identifying specific disruptive factors. These insights can inform targeted interventions to enhance team communication, optimize workflow, and improve patient safety. Understanding these human and organizational factors is essential for developing data-driven practical solutions and optimizations. We explored the OR staff's perceptions of workflow disruptions during robotic-assisted surgery at a major university hospital in Denmark.
Method: An interview guide was developed based on existing literature. Pilot testing with a small sample of participants helped to refine the guide. All OR staff were recruited via email. A representative from each specialty assisted in connecting the investigator and staff and ensured the participation of a minimum of four participants on preselected dates. In June 2024, three focus group interviews were conducted with a total of thirteen OR staff: one with four abdominal surgeons, one with five scrub nurses, and one consisting of two anesthesiologists and two nurse anesthetists. The interviews lasted 60 minutes and were transcribed using Viceron software. The thematic analysis will be conducted using NVivo 14.0 software for coding and identifying key themes.
Results: The focus groups consisted of 62% female participants, with at least one male in each group. The average age of the participants was 46.5(±8.23) years, with 12.5(±9.4) years of post-specialization experience and 5.9(±2.5) years of experience in robotic surgery. The results of the thematic analysis of the focus group interviews are not yet completed but are expected to be completed in time for the conference. Preliminary results indicate apparent differences in workflows between the different staff groups and similarities in the factors perceived as disruptive, such as missing equipment, poor communication, and visitors in the OR.
Conclusion: While the thematic analysis is still pending, the focus group interviews have already provided valuable insights into how different OR personnel perceive workflow disruptions during robotic-assisted surgery. These insights are expected to contribute to developing targeted interventions to improve communication, and reduce workflow disruptions, ultimately enhancing patient safety.

Gastric peroral endoscopic myotomy is effective in treatment of diabetic gastroparesis; results from a randomized double-blinded sham-controlled trial

M.S. Hansen[1], P.B. Miliam[1], M. Damgaard[2], M.D. Wewer[3], H.I. Mizrak[4], H.B. Timm[1], H. Kristensen[1], S. Madsbad[5], S. Møller[6], I. Gögenur[7,8], C.S. Hansen[9], J.G. Karstensen[1,8]
[1]Copenhagen University Hospital- Amager and Hvidovre, Gastro Unit, Hvidovre, Denmark, [2]Copenhagen University Hospital-Amager and Hvidovre, Clinical Physiology and Nuclear Medicine, Hvidovre, Denmark, [3]Copenhagen University Hospital - Amager and Hvidovre, Gastro Unit, Hvidovre, Denmark, [4]Steno Diabetes Center Copenhagen, Complication Research, Herlev, Denmark, [5]Copenhagen University Hospital- Amager and Hvidovre, Department of Endocrinology, Hvidovre, Denmark, [6]Copenhagen University Hospital- Amager and Hvidovre, Departement of Clinical Physiology and Nuclear Medicine, Hvidovre, Denmark, [7]Zealand University Hospital, Department of Surgery, Køge, Denmark, [8]University of Copenhagen, Department of Clinical Medicine, København N, Denmark, [9]Steno Diabetes Center Copenhagen, Department of Translationel Type 2-diabetes Research, Herlev, Denmark

Background: Diabetic gastroparesis (DGP) presents major treatment challenges, and while Gastric Peroral Endoscopic Myotomy (G-POEM) is a minimally invasive procedure, its efficacy in diabetic patients needs further investigation. We conducted a randomized, double-blinded sham-controlled trial to evaluate efficacy of G-POEM in treatment of DGP.
Method: Patients with diabetes, confirmed gastric retention >10% via gastric emptying scintigraphy (GES), and a Gastroparesis Cardinal Symptom Index (GCSI) score ≥1.9 were included. Participants were randomized to undergo either G-POEM or a sham procedure. The primary outcome was the improvement of GES at 3 months, with remission defined as gastric retention ≤10% at 4 hours post-meal. Secondary outcomes included symptom relief measured by GCSI and pyloric distensibility (DI) via EndoFlip. All assessments were blinded.
Results: Eighteen patients were randomized. In the sham group, one patient died of a non-procedure-related heart attack and one G-POEM patient experienced a duodenal perforation. Sixteen patients completed follow-up. In the G-POEM group, 75% achieved complete remission (95% CI 41%-93%) versus 13% in the sham group (95% CI 2%-47%). Median GES decreased from 24% (IQR 19%-50%) to 8% (IQR 3%-13%) in the G-POEM group (p=0.0078), while no significant change occurred in the sham group (GES increased from 31% [IQR 19%-48%] to 40% [IQR 21%-62%], p=0.74). The difference in GES change between groups was significant (median change of 22 [IQR 11-33] in the G-POEM group vs. -1 [IQR -29-12] in the sham group, p=0.015).Symptom relief was more pronounced in the G-POEM group, with GCSI scores decreasing from a median of 2.35 (IQR 2.00-3.55) to 0.93 (IQR 0.53-1.20) (p=0.014), while the sham group showed no improvement (GCSI score increased from 1.90 [IQR 1.90-3.75] to 2.50 [IQR 2.40-3.30], p=0.44). The difference in symptom score changes between groups was significant (median GCSI change of 1.83 [IQR 1.35-2.38] vs. -0.20 [IQR -0.50 to -0.20], p=0.002).

Additionally, DI increased in the G-POEM group by a median of 2.80 (IQR 2.50-3.55) versus a decrease of -1.35 (IQR -1.80 to -0.36) in the sham group (p=0.005). DI increased from 3.10 (IQR 1.80-4.40) to 6.48 (IQR 5.35-7.60) in the G-POEM group (p=0.036), while the sham group saw a decrease from 5.33 (IQR 3.10-7.90) to 4.43 (IQR 2.10-6.20) (p=0.059).
Conclusion: G-POEM significantly improves gastric emptying, symptom relief, and pyloric distensibility, suggesting it is a promising treatment for DGP.

Randomised Phase III Trial of First Line Intraperitoneal Paclitaxel and Systemic Therapy versus Systemic Therapy Alone in Gastric Cancer Patients with Peritoneal Metastases. IPa-Gastric Trial

L.L. Burström[1], J.L. Harbjerg[2], M.P. Achiam[3], D.W. Kjær[4], M. Nielsson[5]
[1]Karolinska universitetssjukhuset., OnkPat/CLINTEC, Karolinska Instituttet,, Stockholm, Sweden, [2]Aarhus Universitetshospital, Department of Surgery, Aarhus, Denmark, [3]Copenhagen University Hospital Rigshospitalet and University of Copenhagen, Department of Transplantation and Digestive Diseases and Department of Clinical Medicine, Copenhagen, Denmark, [4]Aarhus Universitetshospital, Department of Surgery, Aarhus N, Denmark, [5]Karolinska universitetssjukhuset and CLINTEC Karolinska Institutet, Department of Upper Abdominal Diseases, Stockholm, Sweden

Background: The most common site for distant metastasis from gastric cancer is the peritoneum. Median survival for this group of patients is short and systemic cytotoxic treatment response is poor, partly due to the low uptake of the treatment compounds to the peritoneum during systemic chemotherapy. Infusion of cytotoxic drugs directly into the abdominal cavity has been shown to have a high objective response rate and low toxicity. Asian phase II and III trials addressing intraperitoneal paclitaxel, combined with systemic chemotherapy, suggest improved survival compared to systemic therapy alone. So far, no randomised studies addressing taxane-based intraperitoneal treatment combined with systemic chemotherapy in gastric cancer with peritoneal metastases have been performed in Western patients.
Method: The trial is an open-label, multicentre, randomised, phase-III study in the first line setting in gastric cancer patients with peritoneal metastases. Patients will receive the study treatment until disease progression, unacceptable side effects, the investigator's decision to end treatment for other reasons, death, or end of study. Study treatment consists of systemic chemotherapy and intraperitoneal chemotherapy with Paclitaxel through a subcutaneous port in the abdominal wall, fixed to the external aponeurosis and connected to a catheter extending into the abdominal cavity. After discontinuing study treatments, each patient will be followed up for all study endpoints that are clinically feasible, until death or end of follow-up. The primary endpoint is Overall survival (OS), defined as time from randomisation to death from any cause. The primary endpoint will be analysed in the Full Analysis Set (FAS) based on the principle of intention to treat (ITT). An interim analysis is planned for efficacy assessment. Sample size: 262 patients
Results: The protocol is currently in its final stage of reviewing and will be submitted to VEK for approval when finalized.
Conclusion: .

Laparoscopic Heated Intraperitoneal Chemotherapy in locally advanced Gastric Cancer. A Randomized Controlled Feasibility Study investigating early Prophylactic Laparoscopic Hyperthermic Intraperitoneal Chemotherapy. The ProPEC-I trial.

J.L. Harbjerg[1], V. Verwaal[2], M. Norsmark[3], F.V. Mortensen[4], D.W. Kjær[4]
[1]Aarhus Universitetshospital, Department of Surgery, Aarhus, Denmark, [2]Skåne University Hospital, Department of Surgery, Lund, Sweden, [3]Aarhus Universitetshospital, Department of Oncology, Aarhus N, Denmark, [4]Aarhus Universitetshospital, Department of Surgery, Aarhus N, Denmark

Background: Despite advances in treatment, the prognosis for advanced gastric cancer remains poor, particularly with peritoneal spread, where median survival is just 3,1 months. Chemotherapy can extend this to 6-14 months, but long-term survival remains bleak. Early cancer progression during preoperative chemotherapy (PC) occurs in 10-15% of cases, where tumor cells spread into the peritoneal cavity, which is poorly targeted by systemic chemotherapy. HIPEC has been acknowledged as prophylaxis for peritoneal carcinomatosis in gastric cancer patients undergoing resective surgery, improving survival rates. This study is the first in the world to investigate prophylactic laparoscopically administered HIPEC as part of bidirectional treatment prior to definitive surgery. We aim to investigate whether it is feasible and safe with regards to morbidity and toxicity. This study makes way for a larger RCT to investigate if prophylactic HIPEC can improve overall survival by eradicating sub-clinical peritoneal carcinomatosis thus preventing progression in the peritoneal cavity during PC.
Method: Randomized feasibility study, including 14 patients randomized 1:1 to HIPEC/No-HIPEC. The No-HIPEC group received standard regimen of pre- and postoperative chemotherapy and standard D1+ gastrectomy. The HIPEC arm received the ProPEC-I regimen, comprising of one cycle of laparoscopically administered HIPEC with 100 mg/m^2 cisplatin at 40°-41° C and administered intraoperatively during the evaluating laparoscopic exploration at time of randomization followed by the standard regimen as outlined above. The endpoints for the study are toxicity- and morbidity rate and patient reported Quality of Life. Assessment for 3-year progression-free survival and 5-year overall survival will be monitored.

Results: Laparoscopic HIPEC is technically feasible. The HIPEC procedure caused no delay on standard treatment. One patient progressed during preoperative chemotherapy and was unresectable at time of surgery due to direct tumor growth into the retroperitoneum and lymphatic spread but had no macroscopic carcinomatosis. The same patient experienced SAE after the HIPEC procedure, requiring one blood transfusion.
Conclusion: Laparoscopic HIPEC is both feasible and safe, and caused no delays in standard treatment. It did not cause intra-abdominal adherences complicating definitive surgery. It will require a larger study to determine impact on overall survival.

Textbook outcomes for patients with a lived experience of cancer surgery in the upper GI tract – A Qualitative Study.

A. Schucany[1], A.E. Geisler[1]
[1]Rigshospitalet, Department of Transplantation and Digestive Diseases, Copenhagen, Denmark

Background: Gastrointestinal (GI) cancers account for 26% of the global cancer incidence and 35% of all cancer-related deaths. Perioperative treatment plays a crucial role in achieving the desired outcomes for oncological surgery, particularly for GI-cancer surgery. Textbook outcome (TO) is a multidimensional measure considering various perioperative factors, including complete tumor resection, no postoperative complications, and lymph node yield, to define the ideal surgical outcome. TO can be used for quality assurance and comparing patient outcomes across hospitals and international borders. While TO traditionally focuses on the surgeon's perspective, few studies have examined the patient's view of an ideal surgical outcome. Understanding this perspective is crucial to developing a more patient-centered model of care. This study explores the patient's understanding and perception of which physiological and physical elements should be fulfilled before discharge to achieve the ideal TO from the patient's perspective.
Method: A semi-structured interview guide was developed based on existing literature, and the participants were recruited by email from a panel of patients who have undergone upper GI surgery at a large University Hospital in Denmark. Both verbal and written consent was obtained. The interviews lasted 60 minutes and were transcribed with Viceron transcription software. The thematic analysis will be conducted using NVivo 14.0 software for coding and identifying key themes.

Results: Focus groups were held in May 2024 containing seven former patients. The focus groups consisted of 71% male participants. The mean age was 66 and mean time after surgery was 1.4 years. The thematic analysis of the focus group interviews is ongoing, but preliminary results indicate that patients prioritize involvement in their care, emphasizing trust in clinicians as central to their recovery. Additionally, the feeling of control over the timing of their discharge was identified as a key factor in shaping perceptions of a successful surgical recovery.
Conclusion: Incorporating patient perspectives into perioperative care may lead to more holistic definitions of surgical success, ultimately improving patient satisfaction and long-term recovery outcomes. These findings suggest that interventions such as enhanced patient-clinician communication and personalized discharge planning could significantly impact patient-reported outcomes.

3 Paediatric surgery

Childhood inguinal hernia repair and semen quality in healthy adult men drafted for the Danish Military

N. Juul[1], L. Priskorn[2], K. Kvist[3], N. Jørgensen[2]
[1]Nordsjællands Hospital, Kirurgisk Afdeling, Hillerød, Denmark, [2]Rigshospitalet, Afdeling for Vækst og Reproduktion, København Ø, Denmark, [3]Rigshospitalet, Børnekirurgisk Afdeling, København Ø, Denmark

Background: Inguinal hernia occurs in upwards 5% of Danish boys <18 years, and surgery is advised to anticipate hernial strangulation. Hernia repair involves intricate dissection of the funicular structures, and, furthermore, a common underlying etiology with other developmental conditions (e.g., cryptorchidism) has been proposed; altogether potentially influencing adult semen quality. Yet, the current knowledge on adult fertility outcomes in these patients is sparse.
Method: A cohort of healthy men (age 18-25 years) were included between 2002-2022. Upon inclusion, participants delivered a semen sample, hormonal blood test, lifestyle questionaire, and a scrotal ultrasound. The cohort was then linked to nationwide registries on healthcare interactions preceding study inclusion, including childhood surgery. A cross-sectional comparison between men who had undergone inguinal hernia repair at <5 years of age and non-operated controls was performed by logistic regression models adjusting for BMI, sample analysis delay, and sexual abstinence time.
Results: We included 129 men registered with childhood inguinal hernia repair and 4915 non-operated controls. Hernia repair was associated with higher odds of semen values below the WHO (2021) reference ranges: Semen volume (OR 1.8,

95%CI 0.954-3.384, p=0.07), total sperm count (OR 1.7, 95%CI 1.094-2.544, p=0.017), and normal sperm morphology (OR 1.5, 95%CI 0.995-2.122, p=0.053). The groups were comparable on age, BMI, and testicular size.
Conclusion: In this cohort of healthy young men, a history of childhood inguinal hernia repair was negatively associated with semen parameters in adulthood. Whether these associations rely on surgical trauma or underlying embryological mechanisms remains uncertain, and interpretation of the current results warrants caution. Additional analyses to further distinguish the surgical characteristics and hormonal profiles of participants are ongoing.

4.1 Hernia

PROphylactic closed incision Negative-PRESSure treatment versus standard wound dressing in open incisional hernia repair: a multicenter randomized trial (the PROPRESS study)

M. Marckmann[1], M. Willaume Christoffersen[2], P.-M. Krarup[1], F. Helgstrand[2], P. Vester-Glowinski[3], N. Henriksen[4], K. Kiim Jensen[5]
[1]Bispebjerg Hospital, Digestive Disease Center, Copenhagen, Denmark, [2]Zealand University Hospital Køge, Department of Surgery, Køge, Denmark, [3]Rigshospitalet, Department of Plastic Surgery and Burns Treatment, Copenhagen, Denmark, [4]Herlev Hospital, Department of Gastrointestinal and Hepatic Diseases, Copenhagen, Denmark, [5]Rigshospitalet, Department of Surgery and Transplantation, Copenhagen, Denmark

Background: Patients undergoing open incisional hernia repair are highly susceptible to postoperative wound complications. The potential prophylactic role of closed incision Negative-Pressure Therapy (ciNPT) remains confusing due to inconsistent conclusions from low-quality studies. The objective of this study was to compare standard wound dressing (swd) with ciNPT after open incisional hernia repair and evaluate the short-term effect on surgical site infections (SSIs) and secondarily surgical site occurrences (SSOs), patient-reported quality-of-life and scar assessment at 30 days postoperatively.
Method: This was a multicenter two-arm parallel-group randomized, controlled trial (ClinicalTrials.gov: NCT05050786). Randomization was computer-generated with sequences of varying block sizes using www.sealedenvelope.com. Eligibility criteria were elective open incisional hernia repair, age 18 years or above, and ability to provide informed consent. All surgical procedures were performed by hernia specialists. The ciNPT device stayed on for 3 days. The primary outcome was incidence of SSI 30 days postoperatively.
Results: Patients were enrolled via three centers from March 2023 to June 2024 and included 110 who underwent randomization to either swd (n = 54) or ciNPT (n = 56). Median age (IQR) was 63.9 years (16.8), 93.6% were non-smokers, and 40.9% females. Mean (SD) BMI was 29.3 (4.1) kg/m^2 and mean (SD) horizontal defect size was 8.7 (4.7) cm. Overall, 11 (10%) developed an SSI of which 7 were superficial. There was no statistically significant difference in the incidence of SSI (swd 4 (7.4%) vs. ciNPT 7 (12.5%) P = 0.6) or SSO (12 (22%) vs. 14 (25%) P = 0.6) between the two groups. Quality of life significantly improved in general pre- vs. post-surgery (P < 0.001) but had no association with the intervention (mean score change: swd -12.6 vs. ciNPT -13.0 P = 0.9). Finally, there was no difference in patient-reported scar assessment score between the two groups (equal mean scores: 24 P = 0.8).
Conclusion: CiNPT does not reduce the incidence of SSI compared to standard wound dressing nor does it affect patient-reported quality of life. The use of ciNPT as a prophylactic tool for patients undergoing open incisional hernia repair cannot be advised as routine practice, especially since the device is markedly more costly than a standard wound dressing.

4.2 Acute care surgery

Radiological Diagnosis of Acute Cholecystitis in Patients Admitted to a Danish Regional Hospital

D. Bornemann[1], T.N. Neustrup[1], S. Sørensen[1], A. Andersen[1], K. Holte[1], P.D.C. Leutscher[2], H. Mafrag[1]
[1]Regionshospital Nordjylland, Abdominalkirurgisk, Hjørring, Denmark, [2]Regionshospital Nordjylland, Center For Klinisk Forskning, Hjørring, Denmark

Background: Acute cholecystitis can lead to serious complications, and therefore, early diagnosis is crucial. The Danish clinical guidelines recommend ultrasound as the primary diagnostic modality, but the guidelines do not cover all clinical cases. Furthermore, the usage of the more expensive and invasive abdominal computed tomography (CT) scan has increased fourfold in Denmark from 2005 to 2018. This retrospective quality assurance study in the North Denmark Regional Hospital (RHN) aims to investigate how acute cholecystitis is diagnosed and evaluate if abdominal CT scans are clinically justified in patients diagnosed with acute cholecystitis.

Method: Data from all hospitalizations of patients in the RHN, with a diagnosis code including acute cholecystitis, for a 4-year period from March 2019 through February 2023, was extracted. From the total population of 603 patients diagnosed with acute cholecystitis, a sample of 50 patients from each year was randomly selected. Demographics and certain clinical characteristics were investigated such as type of diagnostic modality and indication. Furthermore, a clinical audit was performed by two surgeons, to assess the justification of a CT scan in each case.
Results: From a total of 200 patients diagnosed with acute cholecystitis, 108 (54 %), 87 (43.5 %), and 5 (2.5 %) patients underwent an ultrasound, CT scan, or magnetic resonance cholangiopancreatography as the first radiological modality, respectively. After consensus between the two surgeons, 14 out of 87 (16 %) CT scans as the first diagnostic modality were deemed unjustified. A significantly greater number of the CT scan indications choledocholithiasis, pancreatitis, and pyelonephritis were found in the unjustified group compared to the justified group ($p < 0.05$).
Conclusion: This study concluded that 43.5 % of patients later diagnosed with acute cholecystitis underwent a CT scan as the first or only radiological modality in the RHN from March 2019 through February 2023. Approximately one sixth of abdominal CT scans were clinically unjustified.

A transition of care bundle improves health related quality of life after major emergency abdominal surgery: before-and-after study

D. Kokotovic[1], L. I. Soylu[1], T. Korgaard Jensen[1], J. Burcharth[1]
[1]Copenhagen University Hospital Herlev, Department of Gastrointestinal- and Hepatic diseases, Surgical Division, Herlev, Denmark

Background: The transition from hospital is challenging and patients can be left unprepared at discharge with limited understanding of their diagnosis and confusion about their discharge plan. This study aimed to investigate whether a simple standardized transition of care bundle can improve patient-reported health-related quality of life (HRQoL) after emergency surgery and furthermore increase days at home and reduce readmission after major emergency abdominal surgery.
Method: A single-centre before-and-after study including all consecutive patients undergoing major emergency abdominal surgery was conducted at the Copenhagen University Hospital Herlev and Gentofte during a two-year period from 1 January 2022 to 31 December 2023. A standardized discharge awareness and information bundle consisting increased awareness and coordination of the discharge, targeted written material, and multidisciplinary information meetings was implemented 1 January 2023. Patients were followed up by phone interview and hospital records. Health related quality of life was assessed by the EQ-5D-5L.
Results: A total of 333 patients were included in the control group and 335 patients in the intervention group. The median age in the control group was 70.9 years, and the majority of the included patients underwent explorative laparotomy for bowel obstruction (n = 187, 56.2%). Similarly, the median age in the interventions group was 72.2 years, and the majority underwent explorative laparotomy for bowel obstruction (n = 171, 51.5%). HRQoL was significantly increased in the intervention group compared with the control group at POD 30 (0.846 vs 0.750, $p < 0.001$), at POD 90 (0.925 vs 0.847, $p < 0.001$), and at POD 180 (0.907 vs 0.875, $p = 0.039$). On POD 30 and 90 a statistically significant lower mean utility score in the control group compared with the intervention group was found in the following domains: mobility, self-care, usual activities, and anxiety/depression. On POD 180 a statistically significant lower mean utility score in the control group compared with the intervention group was found in the following domains: mobility, usual activities, and anxiety/depression.
No statistically significant difference in days alive and out of hospital or readmission rates was found between the groups.
Conclusion: A simple transition of care bundle increased quality of life at day 30, 90 and 180 after major emergency abdominal surgery.

Postoperative sexual dysfunction following major emergency abdominal surgery: A prospective cohort study

A. Warmbier Jensen[1], J. Blockmann[2], J. Burcharth[1], D. Kokotovic Gellert-Kristensen[1]
[1]Copenhagen University Hospital Herlev, Department of Gastrointestinal Diseases, Surgical Division, Emergency Surgery Research Group Copenhagen, Herlev, Denmark, [2]Amager and Hvidovre Hospital, Department of Gastrointestinal Diseases, Surgical Division, Hvidovre, Denmark

Background: Sexual dysfunction is a common but underreported complication following major emergency abdominal surgery. This study aims to investigate the prevalence and gender differences in sexual dysfunction up to 90 days postoperatively.
Method: This single-center prospective cohort study included patients undergoing major emergency abdominal surgery at Copenhagen University Hospital Herlev. Follow-up was conducted at 30 and 90 days postoperatively. Sexual function was assessed using the Brief Sexual Symptom Checklist (BSSC), and patients were asked to report whether they were sexually active before and after surgery. Statistical analysis was performed using Pearson's chi-squared test with a significance level of $p < 0.05$.

Results: Of the 180 patients who responded at POD 30, 38.3% reported being sexually active before surgery, but only 17.2% remained active after surgery. At POD 90, 48.3% of 147 patients reported being sexually active before surgery, while 32.7% remained active postoperatively. A significant decrease in sexual activity was observed in both men (63.2% at POD 30 and 45.5% at POD 90) and women (45.2% at POD 30 and 21.1% at POD 90) ($p < 0.001$ for both time points). Out of the patients who completed the BSSC questionnaire, 32.6% reported dissatisfaction with their sexual function at POD 30, which slightly decreased to 26.8% at POD 90. No significant difference in dissatisfaction rates between men and women was found at either time point (POD 30, $p = 1.00$; POD 90, $p = 0.803$).
Conclusion: Sexual dysfunction is a prevalent postoperative complication in both men and women following major emergency surgery, with no significant gender differences observed. These findings highlight the need for proactive discussions and management of sexual health in the perioperative period to improve patient outcomes.

The Impact of Prophylactic Subcutaneous Negative Pressure Wound Therapy in improving Surgical Site outcome and Accelerating Wound Closure

T. Malik[1,2], M. Tvilling Madsen[3], T. Korgaard Jensen[2], J. Burcharth[2]
[1]Slagelse hospital, Department of Surgery, Slagelse, Denmark, [2]Herlev, Department of Gastrointestinal and Hepatic Diseases, Herlev, Denmark, [3]Slagelse, Department of Surgery, Slagelse, Denmark

Background: Surgical site infections (SSI) occur in 17% of emergency abdominal laparotomies. Risk factors include prolonged surgery, wound contamination, smoking, high BMI, and ASA scores >3. The use of subcutaneous negative pressure wound therapy (sNPWT) in emergency abdominal surgeries is a novel technique for at-risk incisional wounds and remains understudied. This study aims to evaluate the incidence of SSIs and seroma accumulation within 7- & 30-days post-operatively in patients receiving prophylactic sNPWT.
Method: This prospective single-center cohort study included consecutive patients, who underwent emergency midline laparotomy and between February 2021 and June 2023 at Copenhagen University Hospital Herlev. Primary outcomes included incidence of SSIs and seroma accumulation at 7 and 30 days postoperatively. Secondary outcomes included skin closure success rate, time to skin closure, number of dressing changes, and length of hospital stay (LOS).
Results: A total of 22 patients (68.2% male, mean age 62 years) received prophylactic sNPWT in the study period. A total of 20 patients completed the 30-day follow-up, with two deaths resulting in a 9.1% mortality rate. At 7- and 30-days surgical site outcomes, like SSI and seroma formation, occurred in 31.8% and 60% respectively. SSI was observed in 13.6% of patients within 7 days and 25% at 30 days. Seroma formation was the complication occurring at the highest rate, in a total of 27.2% of patients. Skin closure on mean day 6.7 (SD = 6.4) was achieved in 91% of patients, with a median LOS of 18 days (IQR = 23.25). Patients with successful wound healing had a shorter median LOS (18 days) compared to those with complications such as SSI, seroma and burst abdomen (median LOS 41.5 days).
Conclusion: These results provide some insight into the potential impact of Prophylactic sNPWT in emergency abdominal surgeries on reducing the incidence of SSIs, contributing to faster wound closure and shorter hospital stays. Further studies comparing sNPWT with conventional wound closure with larger sample sizes are needed to make any firm conclusion on the use of sNPWT in emergency settings.

Delayed First-Admission Cholecystectomy Increases Complication Risk in Acute Cholecystitis Patients

L.W. Erritzøe[1], N.M. Elsayed[2], M.L. Kjær[1], T. Bisgaard[3], F. Helgstrand[1]
[1]Zealand University Hospital, Kirurgisk Afdeling, KØGE, Denmark, [2]Slagelse Hospital, Kirurgisk Afdeling, Slagelse, Denmark, [3]Holbæk Hospital, Kirurgisk Afdeling, Holbæk, Denmark

Background: Acute cholecystitis is the most common complication of gallstone disease. In Denmark, current guidelines recommend early laparoscopic cholecystectomy, preferably within 72 hours of symptom onset and within 24 hours of hospital admission, as delays increase the risk of recurrence and complications. Despite these recommendations, surgery is frequently delayed due to factors such as limited operating room availability, which can exacerbate inflammation and extend the patient's fasting period. This study aims to evaluate whether extended preoperative hospitalization correlates with a higher incidence of complications and to identify common reasons for surgical postponement.
Method: This retrospective study analyzed first-admission cholecystectomies for acute cholecystitis performed between January 1, 2018, and December 31, 2022, at three hospitals. Complications were graded using the Clavien-Dindo classification, and acute cholecystitis was defined and stratified using the Tokyo Guidelines. A logistic regression model was applied to assess the likelihood of postoperative complications, adjusting for ASA (American Society of Anesthesiologists) classification, age, BMI, preoperative symptoms, and Tokyo Guidelines classification (TG18).
Results: A total of 1,545 patients were included. The median time from admission to surgery was 43 hours (range: 2-328), and the median time from confirmed surgical indication to operation was 20 hours (range: 0-235).
An increased time to surgery was significantly associated with a higher risk of postoperative complications (Clavien-Dindo ≥2), with an odds ratio (OR) of 1.18 (95% CI: 1.01-1.31) after adjusting for ASA, BMI, TG18 classification, and duration of preoperative symptoms. When the time to surgery exceeded 72 hours from admission, the risk of complications rose

further (OR = 1.84, 95% CI: 1.16-2.93).
The primary reasons for surgical delays were limited operating room capacity (63%), delays in diagnostic imaging (ultrasound and MRCP), and cases where cholecystitis was not initially suspected.
Conclusion: Delayed cholecystectomy significantly raises complication risk, emphasizing the need for timely surgery.

The association between perioperative epidural analgesia and short-term postoperative complications after emergency laparotomy

T. Al-Taei[1], M. Vester-Andersen[2], S. Abdi[3], M. Gelle[3], T. Korgaard Jensen[1,4], J. Burcharth[1,5]
[1]Herlev and Gentofte Hospital, Emergency Surgery Research Group Copenhagen (EMERGE)- Department of Hepatic and Gastrointestinal Diseases, Herlev, Denmark, [2]Herlev and Gentofte Hospital, Department of Anaesthesiology, Herlev, Denmark, [3]Herlev and Gentofte Hospital, Department of Hepatic and Gastrointestinal Diseases, Herlev, Denmark, [4]University of Copenhagen, Dept of Clinical Medicine, Copenhagen, Denmark, [5]Copenhagen University, Dept of Clinical medicine, Copenhagen, Denmark

Background: Acute postoperative pain is common and often under-managed in surgical care, especially after emergency laparotomy. While epidural analgesia is considered the gold standard for pain management, its superiority over conventional methods has been questioned. Its effectiveness and safety in emergency settings remain under-investigated.
Method: This single-center cohort study examines data from patients undergoing emergency laparotomy for acute high-risk abdominal surgery (AHA) between 2021 and 2023 at Copenhagen University Hospital Herlev, stratified by epidural block use. The primary outcome is the frequency and distribution of postoperative complications, defined and graded by the Clavien-Dindo classification. Secondary outcomes include postoperative length of stay and 30-day mortality.
Results: A total of 556 patients were included of who 364 received epidural analgesia, and 192 did not. The epidural group had a higher median age (71 vs. 73.5 years, $p = 0.004$) and more comorbidities, such as ischemic heart disease (6% vs. 13.5%, $p = 0.003$) and atrial fibrillation (7.1% vs. 24%, $p < 0.001$). There were no significant differences in cardiac, renal, cerebral, thromboembolic, or other systemic complications, except for a higher incidence of pulmonary complications in the epidural group (23.4% vs. 16.1%, $p = 0.047$). No significant differences were observed in 30-day mortality (10.4% vs. 13.5%, $p = 0.276$) or ICU admission rates (16.8% vs. 16.7%, $p = 0.978$), but the epidural group had a longer median hospital stay (9 vs. 6 days, $p < 0.001$).
Conclusion: Epidural analgesia did not impact 30-day mortality or reduce postoperative length of stay. No significant differences in most systemic complications were observed, except for a higher rate of pulmonary complications in the epidural group. These findings suggest that epidural analgesia may not provide a clear benefit in emergency laparotomy, warranting further research into alternative pain management strategies.

Management of Traumatic Splenic Injuries at Rigshospitalet: A Retrospective Study

A. Olsen[1], E. Possfelt-Møller[1], L.R. Jensen[1], M. Taudorf[2], S. Steemann Rudolph[3], C. Ewertsen[4], J. Cohen[4], L. Preisler[1], L. Penninga[1]
[1]Rigshospitalet, Copenhagen University Hospital, Department of Surgery and Transplantation, København Ø, Denmark, [2]Rigshospitalet, Copenhagen University Hospital, Department of Radiology, Division of Interventional Radiology, København Ø, Denmark, [3]Rigshospitalet, Copenhagen University Hospital, Department of Anaesthesia, Traumacentre, København Ø, Denmark, [4]Rigshospitalet, Copenhagen University Hospital, Department of Radiology, København Ø, Denmark

Background: Splenic injury is the most common traumatic abdominal injury. Treatment of splenic injuries can either be surgical (splenectomy) or non-surgical (NS). During the last two decades NS-management (NSM) has been the preferable approach in hemodynamically stable patients. NSM may involve clinical observation or splenic artery embolization (SAE). The aim of this study was to assess the advantages and disadvantages and safety of surgical and NS management of splenic injuries to identify risk factors for failure of NSM.
Method: We retrospectively registered the incidence, management, and outcome of traumatic splenic injuries at Rigshospitalet, a Scandinavian Level 1 Trauma Centre, from January 1, 2019, to December 31, 2023. Patient demographics, mechanism of trauma, management and follow-up imaging and/or surgery were retrieved from patient records.
Results: 226 patients were admitted with traumatic splenic injuries. The majority (92 %) were blunt trauma, with a mean Injury Severity Score (ISS) of 23. Most patients (57 %) had an American Association for the Surgery of Trauma (AAST) splenic injury grade of II-III. 220 patients (97 %) had other associated injuries. NSM was initiated in 178 patients (79 %), with a success rate of 97 %. Failure of NSM occurred in five patients (3%) and were due to hemodynamic instability, decreasing haemoglobin levels, or appearance of free fluid on CT. The five NSM failures led to splenectomy. SAE was performed in 40/178 patients (22 %) in the NSM group. There were no complications to SAE. 48 patients with a splenic injury underwent emergency laparotomy, with 37 leading to splenic intervention; 26 of these involving splenectomies and 11 underwent a topical haemostatic procedure. The mean intensive care unit (ICU) stay was 148 hours, and the mean hospital stay was 17 days. The overall mortality rate was 14.6 %, with a mean of 63 days from admission to date of death. No patients died from their splenic injury, and mortality was related to associated injuries.

Conclusion: NSM is a safe management of traumatic splenic injuries with a high rate of success and low incidence of complications.

Nutritional practice and adherence to nutritional guidelines in a consecutive cohort of emergency laparotomy patients

J.B. Hansen[1], B. Hegstad[1], N. Boujida[1], D. Kokotovic[1], J. Burcharth[1]
[1]Herlev-Gentofte Hospital, Department of Hepatic and Gastrointestinal Diseases, Herlev, Denmark

Background: Postoperative nutrition in emergency abdominal surgery is challenging. This study aimed to describe the nutritional practice at a Danish university hospital and compare the everyday practice to current ESPEN guidelines with a focus on early oral intake after emergency laparotomy
Method: A single-center retrospective cohort study of consecutive patients undergoing emergency laparotomy at Copenhagen University Hospital Herlev from August 2021 to August 2022. Primary operations and reoperations were included. Data was extracted from the electronic patient chart.
Results: A total of 231 patients were included; 118 (51.1%) were male, and the median age was 71 (IQR 58-79). Bowel obstruction was found in 144 (62.3%) of patients. The median postoperative length of stay was eight days (IQR 5-14). Any oral intake on postoperative day (POD) 1 was achieved by 113 (48.9%), increasing to 203 (87.9%) on POD5. 110 (46.8%) had immediate postoperative intake restrictions. Parenteral nutrition (PN) was used in 66 (28.6%), and the median time from surgery to initiation of PN was four days (IQR 3-6.75). PN was initiated prior to POD7 in 49 (74.2%) of cases. The median duration of PN was seven days (IQR 5-15). Postoperative need for PN was associated with an increased risk of postoperative complications, with 333 complications per 100 patients in the PN group and 100 per 100 in patients receiving only oral or enteral nutrition. A total of 44 (19%) of patients underwent reoperation, and of those, a total of 30 (68.2%) received PN. PN was initiated after the reoperation in 21 of the 30 patients (70%).
Conclusion: Early oral nutrition was only achieved in half of the patients. Parenteral nutrition was mostly used in cases with reoperations or other complications. The median time of initiation was earlier than currently recommended by ESPEN

5 Breast surgery

Trends in breast cancer among elderly women: development in estrogen and HER2 subtypes in the last ten years

F.K. Palshof[1,2], L.S. Mørch[2], M.-B. Raaby Jensen[3], H.H. Storm[2], N. Kroman[1,2], T. Holst Filtenborg Tvedskov[1]
[1]Herlev & Gentofte Hospital, Department of Breast Surgery, Hellerup, Denmark, [2]Danish Cancer Society, Danish Cancer Institute, København Ø, Denmark, [3]Rigshospitalet, Danish Breast Cancer Group (DBCG), Department of Oncology, København Ø, Denmark

Background: Increasing life expectancy increases breast cancer (BC) rates in elderly, where better health allows for improved tolerance of treatments. We assessed trends in BC incidence of tumor subtypes for women with focus on the elderly.
Method: We analyzed changes in BC incidence in women by age from 2012-2021 using data from the Nordic countries. We calculated the incidence of BC subtypes by age group using data from the Danish Breast Cancer Group (DBCG) database. We used generalized linear models assuming a Poisson distribution.
Results: In the Nordic countries, 205,305 women were diagnosed with BC between 2012-2021. In Denmark, 50,858 BC patients were diagnosed between 2012-2022, identified with tumor characteristics. Incidence of BC among women aged 80+ increased significantly across the Nordic Countries, with 1.24% per year (95% CI: 0.07:2.41). In Denmark, in the 80+ group, the ER+/HER2- subtype had the highest increase, with 3.56% per year (95% CI: 2.63: 4.50).
Conclusion: Across the Nordic Countries, incidence of BC in women aged 80+ increases. In Denmark, rising incidence of BC is driven by the ER+/HER2- subtype in the 80+ group, which has the best prognosis and gentle treatments. More elderly BC patients will require treatment and follow-up in the future.

Topical Tranexamic acid in mastectomies on hematoma formation: A prospective cohort study

L. Tveskov[1], A. Buheri[1], C. Bille[1]
[1]Odense University Hospital, Department of Plastic Surgery, Odense C, Denmark

Background: Tranexamic acid (TXA) has been suggested to reduce hematoma formation after breast surgery. Existing literature, however, presents inconsistencies regarding the methods of administration and dosages for topical application. This study aims to investigate the effect of perioperative administration of topical TXA on mastectomy procedures, focusing on postoperative hematoma formation and drain output.
Method: The study cohort was included during October 2020 until September 2023 and comprised two consecutive periods. In the first, the control group, included women undergoing mastectomy and receiving no TXA. In the second period, all women undergoing mastectomy received 20ml of 50mg/ml TXA retrogradely into the drain immediately after closure of the cavity. In both groups most women had either axillary clearance or sentinel node biopsy done in addition to the mastectomy. All medical records were thoroughly scrutinized for information on the primary outcomes; hematoma formation requiring surgical intervention and mean drain output 24 hours postoperatively. Several other possible confounders as age, BMI, smoking, and use of anticoagulant were also registered. This study was designed in accordance with STROBE guidelines.
Results: Among 271 women (297 breasts) receiving topical TXA and 264 women (278 breasts) serving as a control group, 4 (1.4%) and 19 (6.8%) women, respectively had surgical revisions due to hematoma. This was statistically significant (p=0.005). Furthermore, the TXA group demonstrated a significantly lower mean drain output within the first 24 hours postoperatively, averaging 67.6ml compared to 103.9ml in the control group (p=0.001).
Conclusion: Administering 20ml of 50mg/ml topical TXA retrogradely into the drain after skin closure significantly reduces the incidence of hematoma formation by approximately 79%, as well as the mean drain output within the first 24 hours following a mastectomy.

Routine Blood Tests Fail to Detect Metastatic Disease but Delay Treatment in Early Breast Cancer

A.T. Selesko[1], M. Rindom[2], O. Graumann[3], M.D. Lautrup[2]
[1]Regional Hospital Viborg, Department of Breast Surgery, Viborg, Denmark, [2]Aarhus University Hospital, Department of Plastic and Breast Surgery, Aarhus, Denmark, [3]Aarhus University Hospital, Department of Radiology, Aarhus, Denmark

Background: **Background:** In Denmark, blood tests are administered as part of the diagnostic screening process for metastatic disease in patients with early breast cancer. This study aims to assess these blood tests' efficacy and investigate the impact of the subsequent computerised tomography (CT) scans on the duration of the time to treatment.
Method: **Method:** We conducted a retrospective cohort study encompassing all early-stage breast cancer patients referred to the Department of Plastic and Breast Surgery, Aarhus University Hospital, from January 1st, 2020, to December 31st, 2022. Patients who underwent an initial CT scan per the protocol were omitted. Logistic regression was employed to explore the association between blood test results and metastatic disease. Univariable and multivariable linear regression was used to assess the effects on time to treatment when blood test-indicated CT scans were performed.
Results: **Results:** Out of 790 patients, ten were diagnosed with metastatic disease. There was no association between abnormal blood tests and the presence of metastatic disease, with an odds ratio of 0.77 and a 95% CI ranging from 0.21 to 2.74. 367 (46%) patients exhibited abnormal blood test results, prompting 70 (8.8%) patients to undergo a CT scan solely due to blood test results. In total, 203 (26%) patients underwent CT scans, performed either due to symptoms, x-ray findings, or blood test results. When isolating the effects of blood test-prompted CT scans, a statistically significant delay of 2.8 days (p=0.001) in time to treatment was found.
Conclusion: **Conclusion:** This study suggests that blood tests are insufficient as a screening tool for detecting distant metastatic disease. However, their use frequently results in a significant number of CT scans, which often prompt further testing and extend time to treatment without clear clinical benefit. This may lead to increased healthcare costs and potentially heightened patient anxiety.

6 Nurses

Uddannelsesforløb for yngre læger i Endoskopi (koloskopi)

J. McGeer[1], T. Petersen[1]
[1]Nordsjællands Hospital, Endoskopi afsnit, Hillerød, Denmark

Background: I Danmark er der ingen tradition for standardiseret uddannelsesforløb for yngre kirurger og gastroenterologer, og begrænsede ressourcer til supervision ydes af erfarende endoskopører.
Method: Et struktureret uddannelsesforløb på 10 dage blev tilbudt yngre læger. Introduktionsdagen bliver tilbragt i simulationsrummet, hvor yngre læger uddannes i de grundlæggende principper for koloskopi og koloskopets funktioner. Dag 1 i Endoskopien består af introduktion til afdelingen. Herunder gennemgang af udstyr, ergonomi, medicin og teamdynamikken i procedurerummet. Herefter observeres kursisterne hvordan den uddannelsesansvarlige skoperende sygeplejerske udfører en komplet koloskopi. Kursisterne bliver undervist i retraktion af koloskopet, med vægt på at

fastholde lumen og observerer tarmvæggen. Når tilbagetrækningen er tilfredsstillende, starter praktikanten indføring af skopet med nøje supervision og træning i manøvreteknikker. Denne arbejdsgang fortsættes, indtil praktikanten er fuldt ud kompetente til at gennemføre proceduren. Samtidig bliver patologien forklaret. Denne træning omfatter polypektomi, biopsitagning, arbejdsgang ved cancerfund og patientvejledning. Målet er at gennemføre cirka 30 koloskopier i 10-dages perioden, efterfulgt af to dage om måneden på endoskopiafdelingen, for at vedligeholde færdigheder og opnår yderligere kompetencer. Deltagerne bliver evalueret af de uddannelsesansvarlige skoperende sygeplejersker gennem standardiserede evalueringsskemaer OSATS (Objective Structured Assessment of Technical Skills). Deltagerne gennemfører en skriftlig vurdering af træningen og bliver interviewet af en uddannelsesansvarlig kirurgisk overlæge for at evaluere effekten af kurset. Interviewene bliver transskriberet og analyseret ved hjælp af induktiv kvalitativ analyse.
Results: Ti yngre læger gennemførte struktureret uddannelsesforløbet. Interviewresultater viste, at alle deltagere var meget positive for uddannelsesforløbet. Det gav tryghed for de yngre læger, at underviserne altid var til stede. Dagens program var altid reduceret, så der netop var tid til oplæring. Vedligeholdelsesdagene var også vigtige for de yngre læger. For afdelingen har det været en positiv ressource.
Conclusion: Et koloskopiuddannelsesprogram for yngre læger pegede på en fremragende og meget effektiv læringsmulighed.

7 PhD Cup

Colonic resection and stoma formation due to chronic diverticular disease - incidence and predictors

H.R. Dalby[1,2], R. Erichsen[1,2], K.A. Gotschalck[3], K.J. Emmertsen[1]
[1]Randers Regional Hospital, Department of Surgery, Randers, Denmark, [2]Aarhus University Hospital, Department of Clinical Epidemiology, Aarhus N, Denmark, [3]Horsens Regional Hospital, Department of Surgery, Horsens, Denmark

Background: There is no consensus on patient selection for elective colonic resection in patients with chronic diverticular disease (cDD). Early identification of patients who are likely to require surgery enables timely elective resection, which could decrease the burden of cDD as well as the risk of emergency surgery. This study aimed to investigate the incidence of emergency and elective colonic resections or stoma formation in patients with cDD and explore predictors for surgery.
Method: This cohort study used Danish national healthcare data to identify all patients with cDD from 1996 to 2021. The index date was the date of the second hospital contact due to diverticular disease. Incidence of surgery due to cDD was calculated as cumulative incidence proportions (CIP), treating death as a competing risk. Predictors for surgery were explored in a Cox proportional hazard model.
Results: A total of 33,951 patients with cDD were included. The median age at the index date of cDD was 68 (57-78) years and 62% were female. The overall 5-year CIP of surgery was 13.9% (elective surgery 9.8%, emergency surgery 4.2%). Patients with complicated cDD including fistula, stenosis, or perforation had a 3 to 6-fold higher incidence of surgery overall compared to patients with uncomplicated cDD. The incidence of elective surgery decreased with age and comorbidity and increased with the number of emergency admissions.
Conclusion: Among patients with chronic DD, approximately 14 out of 100 will undergo surgery within a five-year time frame, of whom nearly one-third will undergo emergency procedures. Clinicians seem reluctant to perform surgery in older and comorbid cDD patients. Patients with cDD should be considered for elective colonic resection if they have complicated disease or more than three hospital contacts, as they are likely to undergo surgery eventually.

Assessment of metabolic liver function in a porcine model of partial portal vein ligation using hyperpolarized [1-^{13}C] pyruvate MRI

U. Kjærgaard[1,2,3], J.A. Lund[2], M. Redda[1], M.H. Kristensen[1], M. Aastrup[1], N. Bøgh[1], K. Sivesgaard[4], M.A. Ohliger[5], D.B. Vigneron[5], L.B. Bertelsen[1], A.K.O. Alstrup[6], E.S. Hansen[1], F.V. Mortensen[2], C. Laustsen[1]
[1]Department of Clinical Medicine, MR Research Centre, Aarhus N, Denmark, [2]Aarhus University Hospital, Department of Surgery, Section for HPB Surgery, Aarhus N, Denmark, [3]Horsens Regional Hospital, Department of Surgery, Horsens, Denmark, [4]Aarhus University Hospital, Department of Radiology, Department of Clinical Medicine, Aarhus N, Denmark, [5]University of California, San Francisco, Department of Radiology & Biomedical Imaging, USA, San Francisco, United States, [6]Aarhus University Hospital, Department of Nuclear Medicine & PET, Department of Clinical Medicine, Aarhus University, Aarhus N, Denmark

Background: Preoperative assessment of liver function is essential before partial hepatectomy to predict the risk of post hepatectomy liver failure (PHLF), a severe and life-threatening complication. Traditional methods have focused on volume estimation of the future liver remnant (FLR). However, liver volume does not always reflect liver function, particularly in patients with compromised liver parenchyma. This study aimed to investigate the metabolic changes in a porcine model of partial portal vein ligation (PVL) using hyperpolarized magnetic resonance imaging (HP-MRI) with [1-^{13}C] pyruvate.

Specifically, we sought to quantify and compare the metabolic conversion rates of pyruvate to lactate (k_{PL}) and pyruvate to alanine (k_{PA}) in the FLR and the deportalized liver (DL).
Method: Six pigs underwent PVL, dividing the liver into a DL and a FLR with intact portal vein-supply. HP-MRI with [1-^{13}C] pyruvate was performed at baseline, post-surgery, and 6-8 days after surgery, in combination with gadoxetate disodium MRI. Metabolic conversion was quantified with kinetic modelling rate constants k_{PL} and k_{PA}. Additionally, liver function was assessed by relative liver enhancement (RLE) in the hepatobiliary phase after gadoxetate disodium injection.
Results: Mean k_{PL} was increased in FLR compared to DL at post-surgery and 6-8 days after surgery (159.8 % and 136.0 %, respectively, P = 0.002), while k_{PA} was unaltered (P = 0.76). Thus, indicating a metabolic shift towards glycolysis that aligns with the energy demands of liver regeneration in the FLR. Contrarily, RLE did not reveal significant changes in the FLR or DL (P = 0.6857), underscoring the sensitivity of HP-MRI in detecting metabolic alterations.
Conclusion: Hyperpolarized [1-^{13}C] pyruvate MRI detected increased k_{PL} in the FLR compared to the DL following PVL in a porcine model. This non-invasive metabolic imaging technique could serve as a powerful tool for evaluation of liver function prior to partial hepatectomy and consequently improve patient outcomes by reducing the risk of PHLF.

Myocardial injury after non-cardiac surgery in patients undergoing acute abdominal surgery

C. Kanstrup[1]
[1]Nordsjællands Hospital, Kirurgisk Afdeling, Hilleroed, Denmark

Background: This study aimed to investigate myocardial injury after non-cardiac surgery (MINS) among patients undergoing acute high-risk abdominal (AHA) surgery by estimating the incidence, assessing the association with short-term mortality, determining the impact of dynamic troponin changes, and investigating whether screening for MINS with subsequent medical treatment impacts mortality. Furthermore, it examined the association between coronary artery calcification (CAC) score, MINS, and mortality risk after AHA surgery.
Method: The study included patients undergoing AHA surgery at NOH from February 2008 to February 2023. From March 2019, postoperative troponin screening was conducted the first four days after surgery. MINS was defined as troponin > 59 ng/l and affected patients received individualized treatment after multidisciplinary consultations. Patients undergoing surgery before March 2019 served as historical controls. Between March 2021 and February 2023, consenting patients underwent a preoperative thoracic CT scan to measure CAC, individually and blindly assessed by two cardiologists. Analyses included CAC as a continuous variable and stratified into risk groups.
Results: The incidence of MINS was 24%. The unadjusted 30-day and 1-year mortality were 19.8% and 35.9% in MINS patients compared with 2.7% and 11.6% in non-MINS patients ($p < 0.001$). This difference remained significant after adjustment. Dynamic troponin changes did not impact mortality. Troponin screening did not significantly reduce mortality, with 30-day mortality rates of 13.8% in controls and 11.1% in screened patients. Among MINS patients, 73% had cardiac consultations, but 83% had no medical interventions. There were significant associations between MINS and CAC, OR of 1.17 ($p = 0.008$), and severe calcification (CAC-score ≥400) in the univariable models but not in multivariable analysis.
Conclusion: MINS was frequent and was associated with increased mortality, but screening did not reduce mortality. No significant association between CAC, MINS, and mortality was found. MINS remains a clinically important risk factor, warranting continuous research to improve outcomes.

Targeted Axillary Dissection after Neoadjuvant Treatment for Breast Cancer

F. Munck[1], I. Vejborg[2], C. Lanng[1], N. Kroman[1], T. Tvedskov[1]
[1]Gentofte Hospital, Dept of Breast Surgery, Hellerup, Denmark, [2]Gentofte Hospital, Dept of Breast Examinations, Hellerup, Denmark

Background: In node-positive breast cancer, 30-60% of patients achieve axillary complete response after neoadjuvant treatment (NACT). These patients may be spared an axillary lymph node dissection (ALND) and instead receive staging with targeted axillary dissection (TAD). TAD consists of selectively marking a metastatic lymph node and excising it with the sentinel nodes after NACT. In case of metastases in the TAD nodes, ALND is recommended. The most optimal marking method is unknown, and whether ALND benefits prognosis in patients with minimal residual metastases is discussed. This PhD project compared identification rates (IR) with various TAD marking methods and identified clinicopathological characteristics associated with low metastatic burden in the TAD nodes.
Method: Node-positive breast cancer patients receiving NACT and TAD between 2016 and 2021 were identified from the DBCG database and patient files. Lymph node IR for different marking methods was calculated using descriptive statistics. Multivariate logistic models were used to determine factors associated with pre-defined levels of axillary metastatic burden.
Results: We included 685 patients. Marking with ^{125}I-seed at diagnosis had a 99% IR. Compared to marking with a coil at diagnosis and re-marking shortly before surgery, placing a ^{125}I-seed at diagnosis had significantly fewer unsuccessful excisions (OR 0.04, 95%CI 0.01-0.27, p = <.0001). Re-marking before surgery with ink on the skin had significantly more unsuccessful excisions compared to re-marking with ^{125}I-seed (OR 5.34, 95%CI 1.62-17.60, p = <.0001).

Finding isolated tumor cells in the TAD nodes (OR 0.11, 95%CI <.01-0.82, *p* = 0.02) or breast tumor complete response (OR 0.07, 95%CI <.01-0.56, *p* = <.01) gave ≤4% predicted risk of >3 metastases in the remaining axillary lymph nodes.
Conclusion: TAD with ^{125}I-seed marking at diagnosis provides the highest IR among researched methods. Additionally, two subgroups had minimal risk of >3 metastatic axillary nodes after TAD, indicating the potential for de-escalated axillary treatment.

GrimAge as Predictive Tool for Pancreatic Surgery Outcomes: An Assessment of Epigenetic Clocks

S. Kollbeck[1,2], C. Palnæs Hansen[1], J. Sidenius Johansen[3], M. Bonde[2], E.E. Dencker[2], J.H. Storkholm[1], S. K. Burgdorf[1], A. Skov Millarch[2], P. Suno Krohn[1], J.G. Hillingsø[1], J.F. Christensen[4], M.H. Sillesen[1,2]
[1]Copenhagen University Hospital, Rigshospitalet, Department of Organ Surgery and Transplantation, København Ø, Denmark, [2]Copenhagen University Hospital, Rigshospitalet, Center for Surgical Translation and Artificial Intelligence Research (CSTAR), København Ø, Denmark, [3]Copenhagen University Hospital, Herlev and Gentofte Hospital, Department of Oncology, Copenhagen, Denmark, [4]University of Southern Denmark, Department of Sports Science and Clinical Biomechanics, Odense, Denmark

Background: Surgical resection followed by chemotherapy is the only curative option for patients with resectable pancreatic ductal adenocarcinoma (PDAC), but perioperative morbidity is high. Traditional risk assessments often fall short in predicting postoperative complications and the likelihood of completing adjuvant therapy. Epigenetic age acceleration (EAA) measures biological aging through DNA methylation patterns and may offer insights into these outcomes.
Method: This project was a collaboration of two prospective biomarker studies: BIOPAC ("Biomarkers in patients with pancreatic cancer (BIOPAC)" study (NCT03311776) and SUPREME - Circulating Epigenetics in Pancreatic Surgery (NCT04947696). Clinical data and preoperative blood samples of 336 patients were collected from Danish patients with localized PDAC between July 2009 and May 2023. Epigenome-wide DNA methylation analysis targeting CpG Islands was conducted using the Infinium Methylation EPIC v2.0 Kit (Illumina). The primary outcome was the association of EAA from three different DNA methylation clocks (Horvath Age, Pheno Age, and GrimAge) with overall survival. Secondary outcomes were the risk of non-completion of adjuvant chemotherapy, and the occurrence of severe postoperative complications (Clavien-Dindo grade 3b or higher).
Results: GrimAge EAA was significantly associated with overall survival (HR 1.14, 95% CI [1.02–1.26], P = 0.021). GrimAge EAA was also a strong predictor of non-completion of adjuvant chemotherapy (OR 1.47, 95% CI [1.20–1.80], P = 0.0002) and severe postoperative complications (OR 1.76, 95% CI [1.16–2.66], P = 0.008).
Conclusion: GrimAge EAA could be a useful tool for preoperative risk assessment in patients with PDAC, helping to evaluate patient frailty and guide surgical decisions.

PROphylactic closed incision Negative-PRESSure treatment versus standard wound dressing in open incisional hernia repair: a multicenter randomized trial (the PROPRESS study)

M. Marckmann[1], M. Willaume Christoffersen[2], P.-M. Krarup[1], F. Helgstrand[2], P. Vester-Glowinski[3], N. Henriksen[4], K. Kiim Jensen[5]
[1]Bispebjerg Hospital, Digestive Disease Center, Copenhagen, Denmark, [2]Zealand University Hospital Køge, Department of Surgery, Køge, Denmark, [3]Rigshospitalet, Department of Plastic Surgery and Burns Treatment, Copenhagen, Denmark, [4]Herlev Hospital, Department of Gastrointestinal and Hepatic Diseases, Copenhagen, Denmark, [5]Rigshospitalet, Department of Surgery and Transplantation, Copenhagen, Denmark

Background: Patients undergoing open incisional hernia repair are highly susceptible to postoperative wound complications. The potential prophylactic role of closed incision Negative-Pressure Therapy (ciNPT) remains confusing due to inconsistent conclusions from low-quality studies. The objective of this study was to compare standard wound dressing (swd) with ciNPT after open incisional hernia repair and evaluate the short-term effect on surgical site infections (SSIs) and secondarily surgical site occurrences (SSOs), patient-reported quality-of-life and scar assessment at 30 days postoperatively.
Method: This was a multicenter two-arm parallel-group randomized, controlled trial (ClinicalTrials.gov: NCT05050786). Randomization was computer-generated with sequences of varying block sizes using www.sealedenvelope.com. Eligibility criteria were elective open incisional hernia repair, age 18 years or above, and ability to provide informed consent. All surgical procedures were performed by hernia specialists. The ciNPT device stayed on for 3 days. The primary outcome was incidence of SSI 30 days postoperatively.
Results: Patients were enrolled via three centers from March 2023 to June 2024 and included 110 who underwent randomization to either swd (n = 54) or ciNPT (n = 56). Median age (IQR) was 63.9 years (16.8), 93.6% were non-smokers, and 40.9% females. Mean (SD) BMI was 29.3 (4.1) kg/m^2 and mean (SD) horizontal defect size was 8.7 (4.7) cm. Overall, 11 (10%) developed an SSI of which 7 were superficial. There was no statistically significant difference in the incidence of SSI (swd 4 (7.4%) vs. ciNPT 7 (12.5%) P = 0.6) or SSO (12 (22%) vs. 14 (25%) P = 0.6) between the two groups. Quality of life significantly improved in general pre- vs. post-surgery (P < 0.001) but had no association with the intervention (mean score

change: swd -12.6 vs. ciNPT -13.0 P = 0.9). Finally, there was no difference in patient-reported scar assessment score between the two groups (equal mean scores: 24 P = 0.8).
Conclusion: CiNPT does not reduce the incidence of SSI compared to standard wound dressing nor does it affect patient-reported quality of life. The use of ciNPT as a prophylactic tool for patients undergoing open incisional hernia repair cannot be advised as routine practice, especially since the device is markedly more costly than a standard wound dressing.