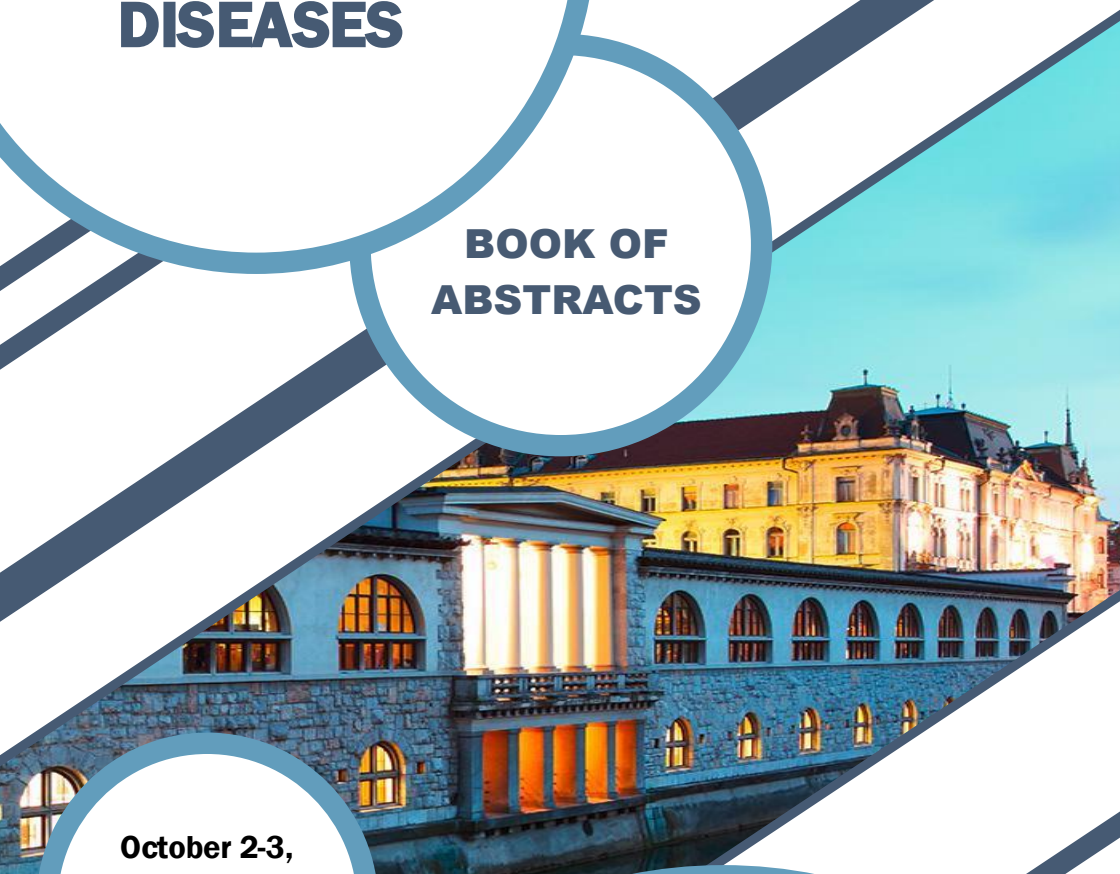
4nd Ljubljana HPB Symposium

PANCREATIC DISEASES

BOOK OF ABSTRACTS



October 2-3, 2026
Ljubljana, Slovenia

DIVISION OF SURGERY
DEPARTMENT OF ABDOMINAL SURGERY

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BOOK OF ABSTRACTS

4th Ljubljana HPB Symposium – **PANCREATIC DISEASES**

University Medical Centre Ljubljana,
Division of Surgery, Department of Abdominal Surgery;
Ljubljana October 2-3rd, 2026

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– **PANCREATIC DISEASES**
Book of Abstracts

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PREFACE

Assist. Prof. Mihajlo Đokić, MD, PhD
Prof. Blaž Trotovšek, MD, PhD

Dear colleagues,

on behalf of the Organising Committee, it is my great honor to invite you to the 4th Ljubljana HPB Symposium – Panreatic Diseases, which will take place in Ljubljana, Slovenia, on October 2–3, 2026, in Hotel Slon.

Pancreatic diseases are increasingly common and represent a major challenge in modern medicine. Their management requires a truly multidisciplinary approach involving gastroenterologists, oncologists, HPB surgeons, radiologists, pathologists, and interventional specialists working together to provide optimal patient care. Rapid advances in diagnostic imaging, endoscopy, minimally invasive surgery, interventional radiology, and systemic therapies are continuously transforming the management of pancreatic diseases and improving treatment outcomes. Therefore, the meeting will be organized into several dedicated sessions encompassing the major pancreatic diseases from the perspectives of different specialties involved in patient care. Through contributions from gastroenterologists, oncologists, HPB surgeons, radiologists, pathologists, and interventional specialists, participants will gain comprehensive insight into contemporary multidisciplinary management strategies and emerging technologies shaping the future of pancreatic disease treatment.

A dedicated part of the symposium will focus on advancing structured HPB surgical education within the WEB E-AHPBA region. The Annual General Assembly of the WEB E-AHPBA Chapter will also be held during the symposium, and all members are warmly encouraged to participate. Our organization grows stronger through active membership, and we encourage colleagues who are not yet members to take this opportunity to join both the E-AHPBA and IHPBA communities. The symposium will also serve as a platform for young doctors and emerging researchers to present their work. We especially welcome younger colleagues, who represent the future of our association and the continued advancement of HPB medicine in the region. We look forward to your presentations and to sharing memorable moments together during the social events planned throughout the meeting.

I sincerely look forward to welcoming all of you to Ljubljana and am confident that this symposium will be a rewarding experience for every participant.

STATE OF THE ART LECTURE

The Metabolic Pancreas: Integrating Exocrine and Endocrine Insufficiency Across the Spectrum of Pancreatic Disease

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Keywords: fatty pancreas, pancreatic exocrine insufficiency, post-pancreatitis diabetes mellitus, pancreatic disease, pancreatic enzyme replacement therapy

The pancreas is an integrated metabolic organ in which exocrine and endocrine functions are closely interconnected. Across the spectrum of pancreatic diseases, structural injury, inflammation, fibrosis, fat accumulation, and surgical resection may impair both digestive enzyme secretion and glucose homeostasis. Nevertheless, pancreatic exocrine insufficiency (PEI) and pancreatogenic diabetes are frequently evaluated and treated as separate conditions.

Fatty pancreas has emerged as a potential link between systemic metabolic dysfunction and pancreatic disease. The recent International Multidisciplinary Consensus Report established “fatty pancreas” as the preferred terminology and proposed standardized diagnostic criteria, particularly using magnetic resonance imaging–proton density fat fraction. Fatty pancreas is associated with obesity, metabolic syndrome, type 2 diabetes, acute and chronic pancreatitis, pancreatic neoplasia, and adverse outcomes following pancreatic surgery.

PEI can occur in chronic pancreatitis, following acute pancreatitis, in pancreatic cancer, after pancreatic surgery, and in association with diabetes mellitus and several non-pancreatic conditions. Its clinical consequences extend beyond steatorrhea and include weight loss, malnutrition, micronutrient deficiencies, metabolic bone disease, impaired quality of life, and potentially increased mortality. The European evidence-based guidelines therefore recommend that diagnosis should integrate symptoms, nutritional assessment, and an appropriate pancreatic function test. Pancreatic enzyme replacement therapy, together with individualized dietary and nutritional support, represents the cornerstone of treatment.

Endocrine dysfunction is similarly heterogeneous. Post-pancreatitis diabetes mellitus may develop after acute or chronic pancreatitis and reflects variable contributions from insulin deficiency, insulin resistance, impaired glucagon secretion, inflammation, and malnutrition. Diabetes following pancreatic surgery and diabetes associated with pancreatic cancer present additional diagnostic and therapeutic challenges. Importantly, PEI and diabetes frequently coexist and may influence each other's clinical presentation and management.

A unified approach to the metabolic pancreas requires systematic assessment of both exocrine and endocrine function throughout the course of pancreatic disease. Earlier recognition of PEI, pancreatogenic diabetes, nutritional deficiencies, and fatty pancreas may facilitate more individualized treatment and improve long-term clinical outcomes.

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SECTIONAL LECTURE

Screening for Pancreatic Ductal Adenocarcinoma and Detecting High-Risk Population

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Pancreatic ductal adenocarcinoma (PDAC) carries the poorest prognosis of the common gastrointestinal malignancies. Survival is determined by stage at presentation, most patients are diagnosed at late stage, only after curative resection is no longer possible. Population-wide screening is not recommended, as disease prevalence is too low. Instead, the American Gastroenterological Association's 2020 Clinical Practice Update and International Cancer of the Pancreas Screening (CAPS) Consortium consensus statements restrict surveillance to those at clearly elevated lifetime risk. Eligible groups for screening are unaffected relatives from familial pancreatic cancer kindreds and carriers of hereditary syndromes. These include Peutz-Jeghers syndrome, hereditary pancreatitis, CDKN2A, Lynch syndrome, and BRCA1/BRCA2/PALB2/ATM mutations. Imaging surveillance combines MRI/MRCP and endoscopic ultrasound. It typically begins at age 50, or earlier for higher-risk genotypes. The target detectable pancreatic neoplasms are resectable stage I pancreatic ductal adenocarcinoma and high-risk precursor neoplasms, such as intraductal papillary mucinous neoplasms with high-grade dysplasia and some enlarged pancreatic intraepithelial neoplasias.

SECTIONAL LECTURE

The Role of Minimally Invasive Approaches in Patients with Pancreatic Neuroendocrine Neoplasms

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Keywords: pancreatic neuroendocrine neoplasm, minimally invasive surgery, pancreatoduodenectomy, left pancreatectomy, laparoscopic surgery, robotic surgery

Background. Minimally invasive pancreatic surgery (MIPS), which encompasses laparoscopic and robotic techniques, has been increasingly adopted for selected patients with pancreatic neuroendocrine neoplasms (pNENs), although its precise role remains under discussion. This study aimed to summarize the current role of MIPS in the management of pNENs. **Methods.** A narrative review of surgical literature was conducted. emphasizing comparative studies and institutional series that evaluated laparoscopic or robotic resection against open surgery. **Results.** MIPS is currently preferred for small, localized tumors without major vascular invasion or extensive nodal disease in the left portion of the pancreatic gland. Laparoscopic distal or left pancreatectomy, with or without splenectomy, is commonly performed minimally invasively and is associated with reduced blood loss, shorter hospital stays, and faster recovery, while achieving comparable R0 resection and survival in carefully selected patients compared with the open technique. Robotic platforms may facilitate spleen-preserving procedures and technically demanding dissections; however, their benefits over laparoscopy remain uncertain. Open pancreatoduodenectomy is the preferred approach for lesions in the pancreatic head. However, robotic pancreatoduodenectomy can provide acceptable outcomes in experienced high-volume centers; however, it has a substantial learning curve and should not be generalized to all centers. Enucleation and central pancreatectomy can be safely performed for well-differentiated pNENs, both openly and minimally invasively. **Conclusions**. MIPS offers short-term recovery advantages for selected patients with localized pNENs and can maintain oncologic quality when performed according to tumor location, size, grade, and institutional expertise. Patient selection, multidisciplinary planning, and long-term follow-up are essential components of this approach.

SECTIONAL LECTURE

Major Resections in Octogenarians – to Resect or Not to Resect?

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Keywords: frailty, perioperative risk, mortality, oncologic benefit, systemic therapy

Background. Demographic aging has driven a steep rise in the proportion of octogenarians diagnosed with pancreatic ductal adenocarcinoma (PDAC), from roughly 15% to nearly a third of new cases over the last decade. Surgery remains the only potentially curative modality, yet in this population the balance between operative risk and oncologic benefit is uniquely precarious.

Perioperative risk. Meta-analysis of 26 studies (22,481 patients) shows octogenarians face roughly double the perioperative mortality (OR 2.37) and increased all-cause morbidity (OR 1.60), driven predominantly by cardiac and pulmonary complications rather than pancreas-specific events. Excess mortality is largely a "failure-to-rescue" phenomenon and much of it occurs after discharge, with 90-day mortality reaching 9–11%.

Oncologic benefit. Resection confers a survival advantage over non-operative therapy in early-stage disease, but the benefit attenuates markedly with advancing age and stage, and may vanish beyond age 80 for node-positive or stage III tumours. Critically, only about a quarter to a third of resected octogenarians receive adjuvant chemotherapy, and survival gains are largely confined to those who complete multimodal therapy.

Conclusion. Age alone should not preclude resection. Frailty assessment and comprehensive geriatric evaluation outperform age in predicting morbidity, mortality, and functional decline. The decision to resect should hinge on physiologic reserve, tumour stage, and a realistic probability of completing multimodal therapy—operationalized through shared decision-making. Minimally invasive approaches and neoadjuvant strategies may extend safe resection to carefully selected octogenarians.

SECTIONAL LECTURE

Recent Trends in the Treatment of Acute Pancreatitis

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Keywords: acute pancreatitis, severe acute pancreatitis, necrotizing pancreatitis, abdominal compartment syndrome, walled-off necrosis, endoscopic drainage, surgical necrosectomy

Background. Acute pancreatitis (AP) is a common gastrointestinal disorder and a frequent cause of hospital admission. While most patients experience a mild and self-limiting course, moderately severe and severe AP may result in persistent organ failure, pancreatic necrosis, and significant morbidity and mortality. Recent management has shifted from aggressive supportive therapy and early surgery toward individualized, evidence-based, and minimally invasive treatment. **Methods.** Recent international guidelines, systematic reviews, meta-analyses, and randomized controlled trials addressing the management of AP were reviewed. Particular attention was given to fluid resuscitation, nutritional support, antibiotic therapy, biliary pancreatitis, necrotizing pancreatitis, abdominal compartment syndrome, and indications for endoscopic, interventional radiological, and surgical treatment. **Results.** Current management emphasizes early risk stratification and goal-directed supportive therapy. Moderate fluid resuscitation with balanced crystalloids, particularly lactated Ringer's solution, is preferred over aggressive fluid administration. Early oral feeding is recommended in mild AP as tolerated, while enteral nutrition is preferred in patients with moderately severe or severe disease who cannot maintain adequate oral intake. Prophylactic antibiotics are not recommended for sterile necrosis and should be reserved for confirmed or strongly suspected infection. In biliary pancreatitis, urgent endoscopic retrograde cholangio-pancreatography (ERCP) is indicated primarily for concomitant cholangitis or persistent biliary obstruction, while early cholecystectomy is recommended during the index admission in mild biliary AP. In necrotizing pancreatitis, intervention is indicated for infected necrosis and may be considered in selected patients with symptomatic sterile necrosis or complications such as gastric, duodenal, or biliary obstruction, nutritional failure, recurrent pancreatitis, or fistula formation. Whenever clinically feasible, intervention should be delayed until the necrotic collection becomes organized, usually after four weeks. For anatomically accessible walled-off necrosis (WON), EUS-guided transmural drainage using lumen-apposing metal stents or plastic stents is preferred.

Endoscopic necrosectomy is considered when drainage alone is insufficient. Percutaneous catheter drainage is useful for early collections, collections extending into the paracolic gutters or pelvis, and collections not amenable to endoscopic drainage.

Surgical treatment is reserved for selected situations. Minimally invasive necrosectomy is considered when endoscopic and/or percutaneous treatment fails to achieve clinical improvement or is anatomically unsuitable. Open necrosectomy is reserved for refractory cases or complications requiring operative management, including bowel ischemia or perforation and selected fistulas or hemorrhagic complications. Surgical intervention may also be required in severe AP complicated by abdominal compartment syndrome. Intra-abdominal hypertension should be monitored in all patients with severe disease. Abdominal compartment syndrome is defined by sustained intra-abdominal pressure >20 mmHg associated with new organ dysfunction. If progressive renal and cardio-respiratory failure persists despite optimal medical treatment, gastrointestinal decompression, and percutaneous drainage, urgent surgical abdominal decompression may be required. Persistent multiorgan failure alone, in the absence of abdominal compartment syndrome or another surgical complication, is not by itself an indication for laparotomy. **Conclusions.** The treatment of AP has evolved toward an individualized, evidence-based, and minimally invasive strategy. Appropriate timing and selection of intervention are crucial. Endoscopic and percutaneous techniques are the cornerstone of management of necrotizing pancreatitis, while minimally invasive surgery and, when necessary, open surgery remain important rescue strategies. In the early phase of severe AP, recognition and treatment of abdominal compartment syndrome are critical, with surgical decompression reserved for refractory cases with persistent organ dysfunction. Optimal outcomes require multidisciplinary management involving gastroenterologists, endoscopists, interventional radiologists, surgeons, intensivists, and nutrition specialists.

Optimising the Yield of Diagnostic Tissue Sampling

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Keywords: endoscopic ultrasound, fine-needle biopsy, pancreatic tumour

Endoscopic ultrasound (EUS)-guided tissue acquisition has become the cornerstone of histological diagnosis for solid pancreatic lesions. Advances in needle technology, sampling technique, and specimen assessment have collectively transformed the diagnostic yield achievable in routine clinical practice.

The transition from fine-needle aspiration (FNA) to fine-needle biopsy (FNB) needles represents the most significant technological leap of the past decade. FNB needles, including reverse-bevel and fork-tip designs, consistently provide superior core tissue procurement, enabling histological assessment and ancillary testing — including immunohistochemistry and molecular profiling — with fewer passes required. Current evidence supports 22-gauge needles and a minimum of two passes as the standard approach for solid pancreatic lesions.

Suction technique affects tissue yield. Standard suction, slow-pull capillary technique, and high-negative-pressure wet suction each carry distinct advantages depending on lesion vascularity and consistency: standard suction can enhance cellularity but may increase blood contamination, whereas slow-pull and capillary sampling techniques often improve specimen quality The optimal approach remains lesion-dependent, and familiarity with multiple techniques is essential.

The fanning technique — systematically redirecting the needle through different lesion trajectories within a single pass — maximises sampling of heterogeneous tissue and reduces the number of passes needed to achieve diagnostic adequacy.

Macroscopic on-site evaluation (MOSE), whereby the retrieved core is visually assessed for white or yellow tissue, provides a practical, resource-independent gauge of specimen adequacy. Increasingly, EUS-acquired tissue is also expected to support next-generation sequencing and molecular profiling, making the procurement of a sufficient, well-preserved core a distinct and growing procedural imperative.

Molecular Profiling and Mutations of Pancreatic Ductal Adenocarcinoma (PDAC)

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Keywords: PDAC, DNA, RNA, mutations, molecular profiling

Pancreatic ductal adenocarcinoma (PDAC) is an aggressive malignancy with poor prognosis and accounts for approximately 3% of newly diagnosed cancers in Slovenia. Large-scale genomic studies have substantially improved our understanding of PDAC biology and hereditary cancer predisposition to PDAC.

The most frequently mutated gene in PDAC is KRAS, altered in approximately 93% of tumors. Other commonly altered genes include TP53 (72%), SMAD4 (32%), and CDKN2A (30%), followed by GNAS (8%), RNF43 (7%), and ARID1A (6%). KRAS-wild-type tumors represent a small subgroup enriched for germline mutations and alternative oncogenic drivers.

In routine diagnostics, molecular profiling of the tumor tissue is most commonly performed on formalin-fixed paraffin-embedded tissue. DNA- and RNA-based next-generation sequencing enables simultaneous detection of sequence variants, copy-number alterations and gene fusions.

Although individual actionable alterations are uncommon, their identification may directly influence treatment selection, including KRAS G12C (~1–2%), which can be targeted with KRAS G12C inhibitors; pathogenic BRCA2 (~2%), BRCA1 (~1%), and PALB2 (~1%) variants, which are associated with sensitivity to PARP inhibitors; BRAF V600E (~1%), which is targetable with BRAF/MEK inhibitors; NRG1 fusions (~0.5%), which are targetable with HER2/HER3-directed inhibitors; NTRK1/2/3 fusions (~0.5%), which are targetable with TRK inhibitors; and microsatellite instability-high (MSI-H) status (~1%), which may predict response to immune checkpoint inhibitors.

Approximately 10% of PDACs are associated with germline pathogenic variants. Predisposition genes include ATM, BRCA1, BRCA2, CDKN2A, PALB2, STK11, TP53, and the mismatch-repair genes MLH1, MSH2, MSH6, and PMS2. Thus, both tumor and germline testing are important components of comprehensive molecular evaluation of PDAC.

Immunotherapy, Therapeutic Vaccines, and Targeted Treatments in Pancreatic Ductal Adenocarcinoma

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Keywords: immunotherapy, therapeutic vaccines, targeted treatment, BRCA mutation, RAS mutation

New systemic treatments are reshaping the therapeutic landscape of pancreatic ductal adenocarcinoma (PDAC), a malignancy long characterized by profound therapeutic resistance and dismal survival. Despite incremental advances with cytotoxic chemotherapy, PDAC remains largely refractory to conventional immunotherapy due to its dense desmoplastic stroma, low neoantigen burden, and profoundly immunosuppressive tumor microenvironment.

Immune checkpoint inhibitors (ICIs) have demonstrated meaningful benefit only in the rare subset of MSI-H/dMMR tumors, representing <1% of PDAC cases. Current research therefore focuses on strategies to convert immunologically “cold” tumors into “hot” ones. Combination approaches—such as ICIs with CD40 agonists, STING agonists, or radiotherapy—aim to enhance antigen presentation and T-cell infiltration.

Therapeutic vaccines represent another way to prime antitumor immunity. Personalized neoantigen vaccines, including mRNA-based platforms, have demonstrated the ability to induce robust T-cell responses in postoperative PDAC patients, with early signals suggesting delayed recurrence in responders.

Targeted therapies are becoming increasingly important, particularly with the emergence of RAS-directed agents. ASCO 2026 highlighted the RASolute-302 Phase III trial, in which the multi-selective RAS(ON) inhibitor daraxonrasib significantly improved outcomes versus investigator’s choice chemotherapy in previously treated metastatic PDAC. These results represent the first demonstration that broad RAS inhibition can meaningfully alter the natural history of PDAC. Parallel development of pan-RAS inhibitors and RAS-SOS1 disruptors further expands therapeutic possibilities. In DNA damage repair–deficient tumors, PARP inhibitors continue to offer benefit in BRCA1/2-mutated disease.

Neoadjuvant Therapy in PDAC

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Keywords: pancreatic cancer, neoadjuvant (preoperative) therapy, R0 resection

Prognosis of pancreatic cancer is poor; only a fifth of patients are suitable for surgical treatment at the time of diagnosis, in a third the disease is locally advanced, and in half it is already metastatic. The age-standardized incidence in EU countries is approximately 16–25 cases per 100,000 population per year (Slovenia 24/100,000). It is well known that pancreatic cancer is the leading cause of cancer death.

The current standard approach to therapy, when dealing with clearly resectable pancreatic adenocarcinoma, is upfront surgery (15-20% of patients), followed by postoperative treatment. That way, the median survival of patients ranges from 20 to 24 months, that is, under the most optimal clinical trial conditions. Real-life scenarios, on the other hand, are much less optimistic. After upfront surgical resection, retrospective data showed that about 75% of patients recur within a median of 12 months after surgery.

30-40% of pancreatic adenocarcinomas are borderline resectable or locally advanced. The problem with such tumors is the difficulty of achieving R0 resection; they are usually of poor biology and therefore have a poor outcome even after achieving R0 resection. In these patients, a neoadjuvant approach is mandatory.

The goals of neoadjuvant therapy are tumor regression for a higher likelihood of achieving R0 resection, treatment of micrometastases, avoiding futile operations for progressive disease, and, of course, improving overall and disease-free survival.

Offering neoadjuvant therapy to patients with predictors of high-risk disease better selects patients for radical resection, and also in contrast, patients who progress during neoadjuvant chemotherapy usually have biologically more aggressive diseases and could be spared from surgery and potential morbidity.

Radiotherapy in Neoadjuvant and Postoperative Setting of Pancreatic Cancer

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Keywords: pancreatic cancer, radiotherapy, SBRT

Radiotherapy occupies an increasingly individualised role in the multimodal management of pancreatic carcinoma, a disease whose five-year survival remains low despite rising global incidence. This abstract reviews the evidence for radiotherapy, emphasising stereotactic body radiotherapy (SBRT), in the neoadjuvant and postoperative settings.

Pancreatic cancer cells are intrinsically radioresistant and ablative biologically effective dose (BED: 90 – 100Gy) is needed for durable control. Because of pancreas anatomical location, this is often very challanging. But with newer techniques and respiratory motion management, toxicity is manageable with very rare acute grades ≥3. Pacinets are treated on outpatient basis and most often 5 fractios are used.

In the neoadjuvant setting, PREOPANC-2 found no survival difference between neoadjuvant FOLFIRINOX and gemcitabine-based chemoradiotherapy in resectable or borderline-resectable disease, while the randomised Alliance A021501 trial showed that adding modest-dose hypofractionated radiotherapy to effective induction chemotherapy did not improve, and may have impaired, resection and survival outcomes. In contrast recent systematic reviews (Shouman et al.) found higher conversion-to-resection rates of borderline-resectable and locally advanced disease treated with higher and ablative-dose SBRT.

Postoperatively, four decades of conflicting chemoradiotherapy trials culminate in the recently reported RTOG 0848, where adjuvant chemoradiotherapy found mild improved survival only in node-negative patients. Conventional postoperative chemoradiotherapy is not applied anymore in Slovenia. Also SBRT's postoperative role remains confined only in rare cases of margin positive resection, when surgical residue can be radiologically indentifined.

On the other hand SBRT has an important role in treatement of isolated locoregional recurrences.

Precision Imaging and Theranostics in Patients with Pancreatic Neuroendocrine Neoplasms

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Keywords: pancreatic neuroendocrine neoplasms, theranostics, somatostatin receptor, peptide receptor radionuclide therapy, precision imaging

Pancreatic neuroendocrine neoplasms (panNENs) are among the most common gastroenteropancreatic neuroendocrine neoplasms, with steadily rising incidence. Most panNENs overexpress somatostatin receptors (SSTR), which can be used as a target for both imaging and therapy - a concept known as theranostics. Glucagon-like peptide-1 receptor (GLP-1R) serves as a complementary imaging target, particularly useful for localizing small insulinomas. Other molecular targets such as CXCR4, FAP, and CCK2R are under early investigation, but SSTR and GLP-1R remain the most clinically relevant today.

Precision Imaging: SSTR-PET/CT is the reference imaging standard for staging SSTR-positive panNENs. The dual-tracer "NETPET" approach, combining SSTR-PET with [18F]FDG PET/CT, adds prognostic stratification guiding surgical, medical and theranostic management. For insulinomas - typically small, benign tumors treated by enucleation - GLP-1R PET/CT with [68Ga]Ga-DOTA-exendin-4 offers superior preoperative localization. Intraoperatively, radioguided surgery using gamma probes with SSTR-targeting radiotracers can further improve completeness of resection in SSTR-positive disease.

SSTR-Targeted Therapy (PRRT): [177Lu]Lu-DOTATATE is the established therapeutic pillar of SSTR theranostics. Phase III trials demonstrate efficacy: NETTER-1 established benefit in midgut NETs, NETTER-2 showed first-line superiority in grade 2–3 GEP-NETs (PFS HR 0.28), and the Chinese XT-XTR008 trial with 59% pancreatic primaries demonstrated robust benefit (HR 0.06). COMPETE recently reported positive results favoring [177Lu]Lu-edotreotide over everolimus with superior quality of life. Neoadjuvant PRRT is emerging as a downstaging strategy. Next-generation approaches include SSTR antagonist-based PRRT and alpha-emitting radionuclides.

Conclusions: SSTR-based theranostics defines a precision model in panNENs - from imaging through treatment selection to targeted therapy - with expanding evidence supporting its integration into individualized, multidisciplinary care.

Centralisation of Decision-Making: Impact on Management and Outcomes in Patients with pNEN

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Keywords: pancreatic neuroendocrine neoplasms, centralisation, multidisciplinary team, high-volume centres, outcomes

Pancreatic neuroendocrine neoplasms (pNENs) are biologically heterogeneous tumours for which management ranges from surveillance to complex pancreatic surgery, liver-directed treatment, systemic therapy and peptide receptor radionuclide therapy. This diversity makes treatment decisions highly dependent on accurate diagnosis, staging and multidisciplinary expertise.

Evidence increasingly supports centralised decision-making. In studies of neuroendocrine neoplasms referred to expert multidisciplinary teams, review of imaging and pathology changed stage or grade in a substantial proportion of patients, while the proposed therapeutic strategy changed in approximately half. In a multicentre European study, expert tumour-board review resulted in a clinically significant change in diagnosis, grade, stage or treatment in 61% of patients. Centralised care is also associated with better adherence to current guidelines and influences the quality and extent of pancreatic neuroendocrine tumour surgery.

Population-based pNEN studies show an additional volume-outcome association. Treatment at high-volume or academic centres is associated with greater use of potentially curative primary tumour resection and metastasectomy and with longer disease-specific and overall survival. These associations remain significant after adjustment for measured patient and tumour characteristics, although referral and selection bias cannot be excluded.

Centralisation should therefore be understood primarily as centralisation of expertise and decision-making rather than mandatory delivery of every component of care at the same tertiary centre. A network model, in which all newly diagnosed pNEN cases undergo expert multidisciplinary review while selected treatments and follow-up are delivered locally, may combine oncological quality with accessibility. Complex surgery should remain concentrated in high-volume pancreatic centres.

Systemic Therapy for pNEN: Current Practices and Future Directions

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Keywords: pancreatic neuroendocrine tumors, systemic therapy, targeted therapy, immunotherapy, chemotherapy

Pancreatic neuroendocrine neoplasms represent a heterogeneous group of rare tumors requiring individualized treatment approaches based on tumor grade, differentiation, somatostatin receptor (SSTR) expression, and disease burden. Current systemic therapy options for advanced well-differentiated pancreatic neuroendocrine tumors include somatostatin analogs (octreotide and lanreotide), which serve as first-line therapy for SSTR-positive tumors, providing both symptom control and antiproliferative effects. Targeted therapies, including the mTOR inhibitor everolimus and the multi-targeted tyrosine kinase inhibitors sunitinib and cabozantinib, have demonstrated progression-free survival benefits in randomized trials and are established treatment options, though with modest objective response rates.

Cytotoxic chemotherapy regimens, particularly capecitabine-temozolomide (CAPTEM) and streptozocin-based combinations achieve higher response rates and are preferred when tumor reduction is needed for symptomatic or bulky disease. For poorly differentiated neuroendocrine carcinomas, etoposide-platinum based chemotherapy remains the standard first-line treatment, achieving response rates of 30-67%. Future directions focus on expanding the therapeutic arsenal through novel targeted agents, including next-generation tyrosine kinase inhibitors and agents targeting alternative signaling pathways. Immunotherapy remains an area of active investigation, with checkpoint inhibitors showing promise in biomarker-selected populations, particularly patients with microsatellite instability-high, mismatch repair deficient, or high tumor mutational burden tumors.

Emerging evidence suggests alkylating agent exposure may induce hypermutator phenotypes that enhance immunotherapy responsiveness. Rational combination strategies pairing immunotherapy with targeted therapies, dual checkpoint blockade, or novel agents are under evaluation in clinical trials. As the therapeutic landscape evolves, biomarker-driven patient selection and personalized treatment sequencing will be essential to optimize outcomes in this complex disease.

Peptide Receptor Radionuclide Therapy (PRRT): From Salvage to Neoadjuvant Therapy

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Keywords: neuroendocrine neoplasms, PRRT, theranostics, neoadjuvant therapy, molecular imaging

Peptide receptor radionuclide therapy (PRRT) has evolved from a treatment reserved for heavily pretreated metastatic neuroendocrine neoplasms (NENs) into an increasingly versatile therapeutic modality integrated at various stages of disease management. The NETTER-1 trial established [^{177}Lu]Lu-DOTATATE as an effective treatment for progressive well-differentiated gastroenteropancreatic NENs; however, accumulating evidence suggests that treatment decisions should increasingly be guided by tumour biology, molecular imaging phenotype and expected therapeutic benefit rather than solely by the sequence of prior systemic therapies.

Somatostatin receptor PET/CT, complemented by [^{18}F]FDG PET/CT in selected patients, enables assessment of tumour heterogeneity, differentiation status and prognosis, facilitating personalized patient selection. In appropriately selected patients, salvage PRRT, including retreatment and repeated retreatment, has demonstrated meaningful disease control with an acceptable safety profile.

Particularly in pancreatic neuroendocrine neoplasms, PRRT is emerging as a promising neoadjuvant strategy for patients with initially unresectable or borderline resectable disease. Tumour downsizing may increase the likelihood of curative-intent surgery, reduce the extent of resection and improve multidisciplinary treatment planning. Although prospective data remain limited, early clinical experience supports consideration of PRRT within individualized treatment algorithms discussed by dedicated multidisciplinary teams.

Future developments are expected to further refine patient selection through quantitative molecular imaging, dosimetry-guided treatment adaptation and novel radiopharmaceuticals, including alpha-emitting compounds. PRRT is therefore increasingly transitioning from a salvage therapy towards a biologically driven treatment platform integrated throughout the continuum of care for patients with neuroendocrine neoplasms.

Clinical Presentation and Surveillance Strategies for IPMN – A Gastroenterologist's View

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Keywords: IPMN, EUS FNA, pancreatic cystic tumors

Intraductal papillary mucinous neoplasms (IPMNs) are the most common precursor cystic lesions of pancreatic ductal adenocarcinoma and are increasingly detected due to widespread use of high-resolution cross-sectional imaging. From a gastroenterologist's perspective, the primary challenge is distinguishing low-risk lesions suitable for surveillance from those requiring surgical resection. Most patients are asymptomatic at diagnosis, while others present with nonspecific symptoms such as abdominal pain, recurrent pancreatitis, weight loss, new-onset diabetes, or jaundice, particularly in advanced disease. Clinical assessment should be integrated with imaging characteristics, cyst fluid analysis when indicated, and multidisciplinary evaluation. Magnetic resonance imaging with magnetic resonance cholangio-pancreatography (MRI/MRCP) is the preferred modality for diagnosis and surveillance, with endoscopic ultrasound (EUS) playing a complementary role in evaluating mural nodules, main pancreatic duct involvement, and facilitating cyst fluid sampling.

Surveillance strategies are guided by established risk stratification systems, including the revised Fukuoka and 2024 Kyoto guidelines, which categorize lesions according to high-risk stigmata and worrisome features. Surveillance intervals are individualized based on cyst size, morphology, growth rate, patient age, comorbidities, and surgical fitness. Emerging evidence supports long-term surveillance for most branch-duct IPMNs because malignant transformation may occur even after years of stability, although surveillance discontinuation may be considered in carefully selected elderly patients or those with limited life expectancy.

A patient-centered, multidisciplinary approach remains fundamental to optimizing outcomes. Future directions include integration of molecular biomarkers, artificial intelligence, and risk prediction models to improve individualized surveillance, reduce unnecessary surgery, and enable earlier detection of high-grade dysplasia and invasive carcinoma.

EUS in IPMN: Diagnostic Accuracy and the Expanding Role of Interventional Endoscopy

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Keywords: endosonography, pancreatic cyst, IPMN

Intraductal papillary mucinous neoplasms (IPMNs) represent a heterogeneous group of pancreatic cystic neoplasms with variable malignant potential. EUS enables detailed characterization of cyst morphology, including septations, communication with the main pancreatic duct, ductal dilatation, and, particularly, the presence and morphology of mural nodules. Accurate identification of high-risk features is essential for decision regarding surgical resection or further surveillance.

EUS-guided fine-needle aspiration provides a tool for cyst-fluid analysis and remains an adjunctive rather than standalone diagnostic modality. Analysis of cyst-fluid carcinoembryonic antigen (CEA), glucose, amylase, cytology, and, increasingly, molecular markers can help differentiate mucinous from non-mucinous cystic lesions and refine diagnostic confidence. However, conventional cytology has limited sensitivity for detecting high-grade dysplasia or malignancy, while the interpretation of cyst-fluid biomarkers may be affected by sampling variability. Consequently, cyst-fluid analysis should be interpreted together with clinical, radiological, and endoscopic features.

Advanced EUS techniques may further improve the characterization of IPMNs**.** Contrast-enhanced EUS facilitates assessment of vascularity within mural nodules and the cyst wall, potentially improving differentiation between true enhancing nodules and avascular mucinous plaques. EUS elastography provides a assessment of tissue stiffness and may offer additional information regarding the characterization of mural nodules and adjacent pancreatic parenchyma. Although promising, both techniques currently remain complementary to established imaging criteria.

The role of interventional EUS is also expanding from diagnosis toward treatment. EUS-guided cyst ablation, including radiofrequency ablation and chemoablation, is being investigated as a minimally invasive alternative for selected pancreatic cystic lesions, although evidence remains insufficient to replace surgery for high-risk IPMN.

Diagnostic Dilemmas in SCN, MCN, and Other Cystic Pancreatic Lesions

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Cystic pancreatic lesions (CPLs) are increasingly detected in the era of high-volume cross-sectional imaging, particularly among older adults. Their rising incidental detection has created a common diagnostic challenge: distinguishing benign, indolent lesions from cystic neoplasms with malignant potential, as many entities demonstrate overlapping imaging characteristics.

Morphological overlap on CT and MRI frequently limits accurate lesion characterisation and contributes to a high rate of misdiagnosis. A key diagnostic challenge is the oligocystic variant of serous cystic neoplasm (SCN), which lacks the classic microcystic "honeycomb" appearance and central scar, instead demonstrating a macrocystic morphology that closely resembles premalignant mucinous cystic neoplasms (MCNs). Although SCNs are benign, they may cause compression-related dilatation of the main pancreatic duct, thereby mimicking a worrisome feature of malignancy.

Distinguishing MCNs from branch-duct intraductal papillary mucinous neoplasms (BD-IPMNs) depends on confirming the absence of communication with the pancreatic ductal system; however, this can remain difficult even with high-resolution 3D heavily T2-weighted MRCP sequences. Additional diagnostic dilemmas include differentiating true enhancing mural nodules, which represent high-risk stigmata, from dependent mucin plugs demonstrating intrinsic T1 hyperintensity using subtraction MRI. Furthermore, cystic neuroendocrine tumours and solid pseudopapillary neoplasms may closely mimic MCNs, requiring careful assessment of capsular morphology and enhancement patterns.

As CT and MRI findings may remain indeterminate, international consensus guidelines, including the European and Kyoto guidelines, provide structured risk-stratification algorithms. In equivocal cases, Endoscopic Ultrasound-guided Fine Needle Aspiration (EUS-FNA) serves as a valuable problem-solving tool, enabling cyst fluid analysis and cytological assessment to establish a definitive diagnosis and guide appropriate management.

Accurate diagnosis of cystic pancreatic lesions remains a significant challenge in routine clinical practice because of substantial overlap in imaging appearances. Optimal patient management therefore requires a multidisciplinary approach integrating radiological, clinical, and laboratory findings, with selective use of EUS-FNA in diagnostically uncertain cases.

Radiological Assessment of IPMN: Imaging Criteria and Risk Stratification

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Keywords: intraductal papillary mucinous neoplasm, pancreatic imaging, magnetic resonance cholangiopancreatography, mural nodule, main pancreatic duct; risk stratification

Intraductal papillary mucinous neoplasms (IPMNs) include branch-duct, main-duct and mixed-type lesions, which differ in their imaging features and risk of malignant progression. Imaging plays a central role in their characterization and risk stratification, and radiological findings may significantly influence decisions in multidisciplinary patient management.

The role of magnetic resonance cholangiopancreatography (MRCP), contrast-enhanced magnetic resonance imaging (MRI) and computed tomography (CT) in the diagnosis and characterization of IPMN will be briefly presented. Using selected clinical cases, the presentation will address imaging features associated with an increased risk of high-grade dysplasia or invasive carcinoma, particularly enhancing mural nodules and solid components, main pancreatic duct dilatation, cyst size and interval growth, and findings suspicious for invasive disease.

Particular attention will be given to findings that may be diagnostically challenging in everyday practice despite clearly defined guideline criteria. An intracystic nodular structure should not automatically be considered a true enhancing mural nodule, and reliable assessment of enhancement requires appropriate contrast-enhanced imaging. Similarly, main pancreatic duct dilatation is an imaging finding and should not automatically be equated with a diagnosis of main-duct IPMN without assessment of duct morphology and consideration of other possible causes of dilatation.

Differences in cyst size or main pancreatic duct diameter between consecutive examinations may result from measurements obtained in different imaging planes, on different sequences, or using different measurement techniques, and therefore do not necessarily represent true disease progression. Direct comparison with previous imaging and consistent measurement techniques are essential for reliable assessment of changes over time.

Radiological assessment of IPMN should therefore go beyond checking individual guideline criteria. Relevant imaging risk features, their evolution over time, and the reliability of their assessment should be clearly communicated, as this information may significantly influence further patient management at multidisciplinary meetings.

Interventional Radiology in the Management of Acute Pancreatitis

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Keywords: acute pancreatitis, interventional radiology, percutaneous drainage, step-up approach, pseudoaneurysm, embolization

Pancreatic fluid collections and vascular complications are frequent and potentially serious complications of acute pancreatitis. The management of severe acute pancreatitis has changed substantially over the past two decades, with a shift from early open surgery toward a minimally invasive, step-up approach. Interventional radiology (IR) has become an integral part of the multidisciplinary management of patients with complicated acute pancreatitis. Image-guided percutaneous drainage is an important therapeutic option for infected or symptomatic pancreatic and peripancreatic fluid collections and may also provide a pathway for further minimally invasive treatment. In selected patients, percutaneous drainage can be followed by video-assisted retroperitoneal debridement (VARD) or combined with endoscopic interventions, potentially avoiding or delaying open necrosectomy.

Vascular complications represent another important indication for IR. Pancreatitis-related pseudoaneurysms and arterial hemorrhage can result in life-threatening bleeding and require urgent diagnosis and treatment. Endovascular embolization, most commonly using coils and other embolic agents, is the preferred minimally invasive treatment in the majority of cases. Careful assessment of vascular anatomy and collateral circulation is essential to achieve hemostasis while preserving organ perfusion.

The role of IR should therefore be considered within an individualized, multidisciplinary treatment strategy involving surgeons, gastroenterologists, interventional radiologists and other specialists.

Interventional radiology has become a key component of modern management of severe and complicated acute pancreatitis. Percutaneous drainage and endovascular therapy complement surgical and endoscopic techniques, enabling a less invasive, stepwise approach and reducing the need for open surgery in appropriately selected patients.

Splenectomy for Pancreatic Ductal Adenocarcinoma: Are We Removing the Spleen Because We Should or Because We Always Have? A Critical Appraisal of One of Pancreatic Surgery's Oldest Dogmas

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Keywords: pancreatic ductal adenocarcinoma, distal pancreatectomy, splenectomy, spleen preservation, lymphadenectomy, RAMPS, splenic hilar lymph nodes

For decades, distal pancreatectomy with en bloc splenectomy has been the reference operation for pancreatic ductal adenocarcinoma (PDAC) of the body and tail. The rationale is anatomically persuasive: the regional nodal basin includes stations along the splenic artery, at the splenic hilum and along the inferior pancreatic border, and splenectomy provides the most reliable route to complete clearance and pathological staging. The question is whether these established benefits prove that removal of splenic tissue itself improves survival. This narrative review separates the value of splenectomy from the value of the lymphadenectomy it facilitates. Contemporary nodal-mapping studies show that station 10 metastases occur, but are uncommon overall and strongly dependent on tumour location. The predefined DIPLOMA analysis identified splenic hilar metastases in 4 of 185 patients, with only one isolated hilar metastasis. Retrospective comparative studies in highly selected pancreatic-body PDAC—including a propensity-score matched study—have reported lower lymph-node yield after spleen-preserving distal pancreatectomy but no demonstrable disadvantage in margin status, disease-free survival or overall survival. These data are hypothesis-generating, not practice-changing: selection bias is substantial, the cohorts are small, and no randomized trial has directly compared splenectomy with spleen preservation for PDAC. Splenectomy also has permanent biological consequences, including lifelong susceptibility to severe infection, persistent haematological changes and increased thromboembolic risk. Current evidence therefore supports a restrained verdict.

Routine splenectomy remains the oncological standard because it most reliably guarantees complete regional lymphadenectomy. Spleen-preserving surgery has not been proven equivalent and should not be generalized. However, an independent survival benefit from removing the spleen has also not been proven. Future research should determine whether carefully selected patients can undergo equivalent tumour and nodal clearance while retaining splenic function.

Oligometastatic Disease Treatment

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Keywords: oligometastatic disease, stereotactic body radiotherapy, loco-ablative techniques

The management of metastatic cancer has undergone a paradigm shift. Although metastatic disease was once regarded as uniformly incurable, the recognition of the oligometastatic state—an intermediate stage between localized and widely metastatic disease—has expanded the role of curative-intent local treatment strategies for appropriately selected patients. While this concept has become increasingly accepted in several solid tumors, its application in pancreatic ductal adenocarcinoma (PDAC) remains an area of active investigation.

The management of oligometastatic PDAC requires a multidisciplinary approach, with systemic therapy remaining the cornerstone of treatment. Induction chemotherapy, is administered to control occult micrometastatic disease and identify patients with favorable disease characteristics. Patients who achieve a prolonged disease stability, accompanied by good performance status, may be considered for consolidative local treatment.

Surgical resection represents the most aggressive local therapeutic option and may be appropriate for highly selected patients. Although retrospective studies have reported encouraging long-term survival following combined resection of the primary tumor and metastatic lesions, prospective randomized evidence is lacking, and surgery is not considered standard of care.

Stereotactic body radiotherapy (SBRT) has emerged as an effective non-invasive alternative, providing excellent local control with minimal interruption of systemic therapy. In addition, loco-ablative techniques, including radiofrequency ablation or microwave ablation, offer minimally invasive treatment options for selected patients.These approaches may achieve durable local control and maintaining quality of life. Nevertheless, careful patient selection remains crucial, and ongoing prospective clinical trials are expected to better define the role of local therapies within multimodal treatment strategies for oligometastatic PDAC.

Pancreatoscopy - Current Value and Treatment Potentials

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Keywords: pancreatoscopy, pancreatic duct, chronic pancreatitis, IPMN

Pancreatoscopy has undergone a remarkable transformation over the past decade, evolving from a technically demanding niche procedure into an important adjunct in the diagnosis and minimally invasive treatment of pancreatic duct diseases. The introduction of digital single-operator pancreatoscopy has substantially improved image quality, maneuverability, and procedural feasibility, enabling direct intraductal visualization, targeted tissue acquisition, and therapeutic interventions.

Current evidence supports its greatest value in carefully selected patients with indeterminate pancreatic duct strictures, suspected intraductal papillary mucinous neoplasms (IPMNs), and chronic pancreatitis complicated by obstructing pancreatic duct stones. Direct visualization of the ductal epithelium, targeted tissue sampling, and pancreatoscopy-guided electrohydraulic or laser lithotripsy provide clinically relevant information and therapeutic options that frequently alter patient management while reducing the need for surgical intervention.

Beyond its established indications, pancreatoscopy is increasingly contributing to precision endoscopy. Integration with advanced imaging technologies, improved biopsy devices, and emerging artificial intelligence-assisted image analysis promise greater diagnostic accuracy and more objective characterization of intraductal lesions. Novel therapeutic applications, including intraductal ablative techniques, may further broaden its role in the management of selected pancreatic neoplasms.

Despite these advances, pancreatoscopy remains a highly specialized procedure that should be reserved for well-defined clinical indications and performed in experienced referral centres. Future multicentre prospective studies are needed to better define its impact on long-term clinical outcomes and cost-effectiveness. As technology continues to evolve, pancreatoscopy is expected to become an integral component of personalized pancreatic endoscopy, bridging high-resolution intraductal imaging with targeted therapy.

Dilemmas in Postoperative Follow-up/Imaging – Local Recurrence

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Keywords: pancreatic adenocarcinoma, local recurrence, fibrosis, postoperative surveillance

Background. Despite curative-intent resection, 70 – 80% of patients with pancreatic ductal adenocarcinoma (PDAC) develop recurrent disease within 2 years, with isolated local recurrence occurring in approximately third of patients. Postoperative anatomical distortion, fibrosis, and treatment-related changes at the surgical bed closely mimic recurrent tumor, making early and accurate detection of local recurrence one of the most persistent challenges in PDAC surveillance.

Aim. This presentation reviews the current imaging pitfalls and limitations in detecting local recurrence after PDAC resection. It aims to improve imaging interpretation confidence and guide multidisciplinary follow-up strategies.

Discussion. According to NCCN surveillance guidelines, contrast-enhanced CT should be performed every 3-6 months for the first 2 years after surgical resection, and every 6-12 months thereafter. Differentiating post-surgical fibrosis from recurrent disease on CT and MRI is frequently inconclusive, particularly within the first 6–12 months after surgery, when expected inflammatory and fibrotic changes often obscure subtle recurrent disease. Accurate interpretation requires thorough knowledge of surgical anatomy, expected postoperative changes, and typical recurrence patterns. Key CT findings suggestive of local recurrence include new or growing soft tissue and vessel encasement with luminal narrowing. However, high interobserver variability persists, and there are no reliable size or growth rate thresholds. Serial comparison to a baseline postoperative CT is therefore more reliable than isolated measurements.

Conclusion. No single imaging modality reliably distinguishes local recurrence from postoperative changes in all cases of PDAC. Serial comparison to baseline postoperative imaging, combined with clinical information, CA 19-9 levels, and multidisciplinary discussion, is essential to avoid both delayed recurrence detection and unnecessary intervention for benign post-surgical findings.

Professor E. M. Gadžijev — A Legacy of Surgical Excellence, Science, and Humanity

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Keywords: Professor Gadžijev, liver surgery, hepatobiliary surgery, surgical education, medical legacy

Background. Professor Dr. Gadžijev (d. 23 May 2023) was an outstanding Slovenian liver surgeon, academic, educator, mentor, and humanist whose influence extended well beyond the operating theatre. His career was characterized by surgical excellence, scientific curiosity, professional integrity, and an unwavering commitment to patient welfare.

Contribution. His scientific work focused particularly on liver surgery and surgical anatomy. In collaboration with Professor Dr. Dejan Ravnik, he developed a comprehensive atlas of applied internal liver anatomy, published internationally and recognized as an important educational resource. In Maribor, where he worked for nearly eight years, he played a pivotal role in advancing abdominal surgery, research, postgraduate education, and the development of the Surgical Clinic. His vision also contributed to the broader academic development of medicine in Maribor. Together with Professor Saša Markovič, he founded the Ljubljana Hepatobiliary School (1993–1998), Slovenia's first interdisciplinary educational platform bringing hepatologists and surgeons together with international experts. The school fostered interdisciplinary collaboration, international exchange, and the transfer of contemporary HPB knowledge to a new generation of physicians.

Legacy. Professor Gadžijev's legacy extends beyond his scientific and professional achievements. Through teaching, mentorship, leadership, and his autobiography Scissors, Please, he transmitted a philosophy of medicine grounded in excellence, ethical responsibility, humanity, and respect for the patient. His influence continues through the surgeons and physicians he inspired and the professional standards he established.

European Joint Action of Networks of Expertise (JANE-2) and Pancreatic Carcinoma

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Keywords: JANE-2 project, pancreatic cancer

JANE is a Joint Action that aims to establish 7 new networks of expertise in the field of cancer: Complex and poor prognosis cancers, Palliative care, Survivorship, Personalised primary and secondary cancer prevention, Omnics technologies, Hi-tech medical resources and Adolescents and young adults (AYA) with cancer. In the work package Complex and poor prognosis cancers which addresses pancreatic cancer in addition to lung cancer, the dominant poor -prognosis priorities in almost all countries, Slovenia and 20 other European countries are also involved. In Slovenia, the Institute of Oncology Ljubljana, the National Institute of Public Health, the University Medical Centre Ljubljana, the Faculty of Medicine in Ljubljana, and the University Rehabilitation Institute are participating. JANE-2 sets the gold standard for education, research, innovation and training in the field of cancer. Its core is active colaboration with research organisations, academic institutions, clinics and patient associations. The network will share examples of good practice and knowledge, and ensure accessible top- quality treatment for every patient, regardless of where they live.

Within the scope of the pancreatic cancer, the aims are to:

1. Improve cancer care and patient outcomes by enhancing early detection, diagnosis, and treatment of cancer, as well as by providing education for the medical community and patients, and promoting multidisciplinary care
2. Address inequalities in cancer care across European countries
3. Foster research and innovation by driving cutting-edge research, focusing on personalised treatment.

In Slovenia, we will initially write national guidelines and quality indicators for pancreatic cancer.

Current State of Pancreatic Surgery in University Clinical Centre Tuzla: A Historical and Contemporary Overview

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Keywords: pancreatic surgery, pancreaticoduodenectomy, distal pancreatectomy, enucleation, insulinoma

Background. Pancreatic resection surgery, comprising pancreaticoduodenectomy (the Whipple procedure), distal (spleno)-pancreatectomy, and enucleation of focal pancreatic lesions such as insulinoma, has evolved substantially since its original description in the early twentieth century. We aimed to outline the historical development of these three procedures and to present the current state of pancreatic surgery at the University Clinical Centre (UKC) Tuzla, the principal tertiary referral centre for north-eastern Bosnia and Herzegovina.

Methods. We reviewed the institutional experience with pancreatic resection surgery at UKC Tuzla, totalling 226 patients: 148 pancreaticoduodenectomies, 61 distal (spleno)pancreatectomies, and 17 enucleations of focal pancreatic lesions. Outcome benchmarks for pancreatico-duodenectomy were established through a modified pancreatico-jejunostomy technique and a subsequent study validating postoperative urine amylase as an early predictor of complications, together with a narrative review of current practice in distal splenopancreatectomy and enucleation.

Results. Among the 148 patients undergoing pancreaticoduodenectomy, postoperative morbidity was 28% (literature range 35–43%), mortality 6%, pancreatic fistula 6% (literature 12.9%), and delayed gastric emptying 8% (literature 24–29%), following introduction of a modified pancreaticojejunostomy technique. The remaining 61 distal (spleno)pancreatectomies and 17 enucleations of focal pancreatic lesions, including insulinoma, represent established components of practice at UKC Tuzla, performed predominantly through an open surgical approach.

Conclusion. UKC Tuzla is an established regional referral centre for pancreatic resection surgery, with pancreaticoduodenectomy outcomes that compare favourablywith international benchmarks. Continued case-volume growth, adoption of minimally invasive techniques, and closer regional collaboration remain priorities for the programme.

Implementation of Laparoscopic Distal Pancreatectomy at a Tertiary Referral Centre: A Ten-Year Experience

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Keywords: distal pancreatectomy, laparoscopy, minimally invasive pancreatic surgery, postoperative pancreatic fistula, conversion

Background. Laparoscopic distal pancreatectomy (LDP) has become an accepted minimally invasive approach for selected pancreatic lesions. However, its implementation requires advanced surgical expertise, and data from low-volume centres remain limited. This study evaluated the introduction of minimally invasive distal pancreatectomy at a tertiary referral centre and compared perioperative outcomes with the conventional open approach. **Methods.** A retrospective analysis of a prospectively maintained database was performed including all patients who underwent distal pancreatectomy between 2016 and 2025. Patients were divided according to surgical approach into laparoscopic distal pancreatectomy (LDP) and open distal pancreatectomy (ODP). Converted procedures were analysed separately and excluded from the comparative analysis. Primary endpoints included operative outcomes, whereas secondary endpoints comprised postoperative morbidity, clinically relevant postoperative pancreatic fistula (CR-POPF), postpancreatectomy haemorrhage (PPH), length of hospital stay and mortality. **Results.** During the study period, 129 distal pancreatectomies were performed, including 97 open, 24 completed laparoscopic and 8 converted procedures (conversion rate 25.0%). Median operative time was longer after LDP than ODP (203.5 vs. 185 min, p=0.051). Patients undergoing LDP had a significantly shorter hospital stay (8 vs. 11 days, p=0.008). Blood transfusion rates were similar (4.8% vs. 14.1%, p=0.446). Overall morbidity, major complications (Clavien–Dindo ≥IIIa), CR-POPF, PPH, readmission rate, 30-day mortality and 90-day mortality were comparable between groups (all p>0.05). **Conclusion.** Laparoscopic distal pancreatectomy was associated with a significantly shorter postoperative hospital stay while maintaining perioperative safety and postoperative outcomes comparable to open surgery. Despite a 25% conversion rate reflecting the learning phase and case complexity, LDP represents a safe and feasible approach in appropriately selected patients at a tertiary referral centre.

Implementation of Robotic Pancreatic Programme in Bulgaria

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Keywords: robotic surgery, liver resections, pancreas resections

Robotic surgery represents a modern approach that combines the advantages of minimally invasive techniques with enhanced precision, stability, and control when operating in anatomically complex and difficult-to-access regions. In hepatobiliary and pancreatic surgery, this method is widely applied in both routine procedures, such as cholecystectomy, and highly specialized and complex operations, including liver and pancreatic resections. The main advantages of robotic surgery include reduced surgical trauma, decreased blood loss, lower risk of postoperative complications, and faster patient recovery. In addition, robotic systems provide high-resolution three-dimensional visualization, elimination of physiological tremor, and greater instrument dexterity, which are essential for performing complex reconstructive procedures.

Over the past year, more than 70 robotic surgical procedures have been performed at our unit, including distal pancreatectomy, pancreatico-duodenectomy, bile duct resection with reconstruction, as well as wedge and major liver resections. The accumulated initial experience allows for an analysis of the effectiveness, safety, and applicability of the method in complex and high-risk surgical interventions. Despite its significant advantages, robotic surgery also presents several challenges, including high equipment costs, the need for specialized training, and a prolonged learning curve.

In conclusion, robotic surgery in hepatobiliary and pancreatic surgery represents a significant advancement in modern medicine. It offers safer and more effective treatment options and is gradually becoming a standard in many highly specialized surgical centers.

Pancreatic Surgery - to Drain or not to Drain?

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Keywords: pancreatic surgery, pancreaticoduodenectomy, distal pancreatectomy, abdominal drainage, surgical drain, pancreatic fistula

Prophylactic intra-abdominal drainage has traditionally been considered an integral component of pancreatic surgery. Drains are intended to facilitate early recognition and controlled external drainage of postoperative pancreatic fistula (POPF), postpancreatectomy hemorrhage, bile leakage, and intra-abdominal collections. However, drains may themselves contribute to ascending infection, patient discomfort, delayed mobilization, and prolonged hospitalization. Increasing evidence has therefore challenged the concept of routine drainage following pancreatic resection.

The available evidence differs according to the type of pancreatic resection. After pancreaticoduodenectomy, omission of drainage appears feasible in selected low-risk patients, although concerns remain regarding the consequences of an undrained pancreatic anastomotic leak. After distal pancreatectomy, evidence supporting drain omission is considerably stronger. Recent randomized controlled trials, particularly the PANDORINA trial, demonstrated that a no-drain strategy was non-inferior to routine drainage for major morbidity and was associated with a lower recorded incidence of clinically relevant POPF. Contemporary meta-analyses similarly demonstrate no reduction in mortality, major morbidity, reoperation, or need for postoperative percutaneous drainage with routine prophylactic drainage.

These findings suggest that a risk-adapted strategy incorporating the type of pancreatic resection, pancreatic texture, duct diameter, fistula-risk assessment, intraoperative findings, and institutional capacity for early postoperative imaging and interventional radiology may be the way forward when deciding weather to place darines or not.

The Postsurgical Pancreas: What to Do When Things Go Wrong?

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Keywords: pancreatic surgery, postoperative complications, nonoperative management, postoperative pancreatic fistula

Despite a substantial reduction in postoperative mortality to approximately 5% over recent decades, pancreatic resections remain high-risk procedures. Overall morbidity rates reach up to 67%, with major complications (Clavien-Dindo grade ≥ IIIa) occurring in nearly one-third of patients. Postoperative pancreatic fistula (POPF) constitutes the primary driver of morbidity, frequently precipitating associated complications such as postpancreatectomy hemorrhage, postpancreatectomy acute pancreatitis, delayed gastric emptying and bile leak. These risks are further amplified by recent increased utilization of extended and vascular resections. Clinically relevant POPF (ISGPS grades B/C) occurs in approximately 21% of pancreatoduodenectomies (PD) and up to 27% of distal pancreatectomies (DP). Anastomotic techniques for PD result in comparable fistula rates, however pancreatojejunostomy is generally preferred over pancreatogastrostomy owing to a lower risk of intraluminal hemorrhage. In DP, stapled closure remains the standard approach, whereas adjunctive measures—including fibrin sealants, patches, or reinforced staplers—offer only marginal benefit in most randomized trials.

Effective complication management depends on early detection, standardized treatment protocols, and prompt interventional radiology or endoscopy procedures. The majority of POPFs can be managed nonoperatively with antibiotics, maintenance or repositioning of drains, and percutaneous or endoscopic drainage. Completion pancreatectomy is reserved for life-threatening situations. Perioperative somatostatin or somatostatin analogues are commonly administered to suppress exocrine secretion and mitigate POPF risk, although their benefit remains debated. Infected fluid collections following DP can be effectively addressed by endosonographic-guided transgastric placement of lumen-apposing metal stents. Late post-pancreatectomy hemorrhage, which is strongly associated with POPF, carries high mortality and is best managed by endovascular techniques (coil embolization or covered stenting), achieving success rates of approximately 80%.

In conclusion, meticulous patient selection, technical refinement, evidence-based preventive strategies, and prompt multidisciplinary management of complications are essential to optimize outcomes following pancreatic resection. These complex procedures should therefore be centralized in high-volume centers equipped with advanced endoscopic and radiologic interventional services.

Management of Pancreatic Trauma: A Pancreatic Surgeon's Point of View

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Keywords: pancreatic trauma, main duct injury, AAST, NOM, surgery

Adult pancreatic trauma is rare, occurring in less than 1% of all traumas and in up to 11% of abdominal injuries. Management is challenging and inherently multidisciplinary. Therapeutic decision-making relies primarily on patient hemodynamic status and the AAST-OIS classification. While contrast-enhanced computed tomography (CT) is essential for diagnosing pancreatic injuries in stable patients, initial CT scans obtained within 12 hours of trauma can miss or misdiagnose injuries in up to 40% of cases. Magnetic resonance cholangiopancreatography (MRCP) is highly valuable when confirming pancreatic parenchymal and main pancreatic duct (MPD) disruptions.

While low-grade injuries (AAST I–II) without duct involvement are safely managed non-operatively, the optimal treatment of severe injuries (AAST III–V) with MPD disruption remains highly controversial. The ongoing debate centres on operative versus non-operative management (NOM) in hemodynamically stable patients, where injury location frequently dictates the strategy. Current recommendations state that AAST Grade III distal duct injuries should be managed operatively by resection, with or without splenectomy.

Operative management in this setting improves recovery times and reduces morbidity. Although splenic preservation remains debated, it does not significantly increase morbidity or mortality. Conversely, optimal management of proximal injuries (AAST IV–V) remains highly controversial. Selected cases may be considered for NOM, utilizing endoscopic and percutaneous interventions, while initial surgical management is limited to debridement and wide local drainage. Pancreatic fistula rates remain high (up to 14%). Complete pancreaticoduodenal destruction is rare, carries high mortality, and requires complex reconstruction. Ultimately, severe pancreatic trauma must be managed by a hepatobiliary surgeon.

Management of Benign Pancreatic Tumors in Novi Sad: Application of Contemporary Principles of Diagnostics and Therapy

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Keywords: benign pancreatic neoplasms, serous cystadenoma, intraductal papillary mucinous tumors, neuroendocrine tumors

Introduction. Benign pancreatic neoplasms represent a heterogeneous group of tumors whose incidence has significantly increased due to advanced diagnostic technologies. Their heterogeneity requires precise characterization and individualized therapy to avoid unnecessary surgery and identify tumors with malignant potential. Contemporary principles of treatment are based on risk stratification, enabling differentiation between lesions requiring active treatment and those that can be safely monitored with conservative therapy.

Aim. Analysis of the application of contemporary principles of treatment of benign pancreatic tumors in Novi Sad through a multidisciplinary approach with focus on diagnostics, risk stratification, and outcomes.

Material and Methods. Retrospective analysis of patients with benign pancreatic tumors treated at the University Clinical Center of Vojvodina in Novi Sad. Patients with confirmed diagnosis of benign pancreatic neoplasm based on histopathological or radiological findings were included. Demographic data, clinical presentation, diagnostic findings (conventional CT, magnetic resonance imaging with MRCP sequence, endoscopic ultrasound with tissue sampling capability), laboratory parameters, and applied therapeutic measures were evaluated. Risk stratification was performed according to international guidelines (ASGE, NANETS, SEOM-GETNE), with particular focus on characteristics of cystic lesions, tumor size, presence of symptoms, and signs of malignant potential.

Results. Patients with various types of benign pancreatic tumors were analyzed, including serous cystadenoma, pseudocysts, intraductal papillary mucinous tumors (IPMN) with low-grade dysplasia, and neuroendocrine tumors. Magnetic resonance imaging with MRCP sequence proved to be the gold standard for characterization of cystic lesions, enabling precise identification of cyst type and risk stratification. Endoscopic ultrasound with tissue sampling capability (EUS-FNA) was applied in patients with unclear diagnosis or suspicion of malignancy, which led to definitive diagnosis. In asymptomatic lesions with low risk, conservative therapy with periodic radiological follow-up was applied. Functional neuroendocrine tumors were treated surgically, with distal pancreatectomy being a common procedure.

Non-functional neuroendocrine tumors smaller than 2 cm were monitored with endoscopic ultrasound without initial surgical intervention. In symptomatic lesions or those with signs of malignant potential, surgical resection with appropriate degree of pancreatectomy was performed. Surgical procedures included distal pancreatectomy with splenectomy, duodenopancreatectomy, enucleation, and central pancreatectomy. Patient follow-up showed good long-term outcomes without documented cases of malignancy in patients treated conservatively.

Conclusion. Contemporary diagnostic algorithms and individualized therapy enable optimal risk stratification and avoidance of unnecessary surgical interventions. A multidisciplinary approach represents the key to achieving the best clinical outcomes in benign pancreatic tumors.

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Neoadjuvant Therapy of Pancreatic Cancer

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Pancreatic ductal adenocarcinoma (PDAC) remains associated with a high risk of early systemic relapse, even after potentially curative resection. Neoadjuvant therapy has therefore emerged as an increasingly important strategy, particularly for borderline resectable (BR) and locally advanced disease, and is being increasingly considered for resectable PDAC.

Evidence supports neoadjuvant therapy as a feasible component of care for borderline resectable and selected locally advanced PDAC and is supported by emerging evidence in resectable disease with the potential to improve treatment selection, increase the likelihood of margin-negative resection, and provide early therapy for occult micro metastatic disease. Neoadjuvant therapy also offers a better tolerated systemic therapy compared to adjuvant setting after major surgery.

In BR PDAC, Alliance A021501 established modified FOLFIRINOX (mFOLFIRINOX) as an important reference regimen: 18-month overall survival (OS) was 66.7%, with median OS of 29.8 months; addition of hypo fractionated radiation did not improve outcomes and that arm was closed for futility. PREOPANC demonstrated improved R0 resection and disease-free survival with preoperative gemcitabine-based chemoradiotherapy, although the survival benefit was modest. More recently, PREOPANC-2 randomized 369 patients with resectable/BR PDAC to neoadjuvant FOLFIRINOX or gemcitabine-based chemoradiotherapy and showed no significant OS difference (21.9 vs 21.3 months; HR 0.88, P=0.32).

For resectable PDAC, SWOG S1505 demonstrated feasibility of perioperative mFOLFIRINOX or gemcitabine/nab-paclitaxel but did not establish superiority over historical outcomes. The completed but not yet reported phase III Alliance A021806 and PREOPANC-3 trials directly compare perioperative with adjuvant FOLFIRINOX and address whether neoadjuvant therapy should become standard for resectable disease. KRAS inhibitors will play a major role in neoadjuvant systemic therapy in coming years. Vaccines will also be of great interest in resectable disease.

Neoadjuvant therapy is established as an important strategy for borderline resectable and selected locally advanced PDAC and is supported by emerging evidence in resectable disease. Its routine use and optimal implementation in resectable PDAC remain areas of active investigation. Future studies should refine patient selection using molecular and circulating biomarkers, define optimal systemic regimens and treatment duration, and clarify the role of radiation and surgery within contemporary multimodality treatment. Patients must be encouraged to participate in clinical trials.

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