

Editorial

Latest Advances in Pancreatobiliary Endoscopy

Marco Spadaccini ^{1,*}  and Alessandro Fugazza ² ¹ Department of Biomedical Sciences, Humanitas University, 20072 Pieve Emanuele, Italy² Endoscopy Unit, Humanitas Clinical and Research Center—IRCCS, 20089 Rozzano, Italy; alessandro.fugazza@humanitas.it

* Correspondence: marcospadaccini9@gmail.com

The field of biliopancreatic endoscopy has witnessed transformative advancements, driven by technological innovations, novel techniques, and an evolving understanding of disease processes. This Special Issue showcases cutting-edge research and developments that push the boundaries of clinical practice and address longstanding challenges. Endoscopic ultrasound (EUS)-guided fine-needle biopsy (FNB) has emerged as the preferred technique for sampling solid pancreatic lesions [1,2]. By delivering larger tissue cores and preserving histological architecture, FNB enhances diagnostic accuracy and facilitates personalized treatments. This approach surpasses fine-needle aspiration (FNA) and demonstrates the critical role of needle design, sampling techniques, and specimen processing in optimizing outcomes. The review by Dhar et al. [3] offers insights to help endoscopists navigate these advanced methodologies effectively.

Interventional EUS has expanded beyond diagnostics to manage complications of pancreatic cancer, including gastric outlet obstruction and malignant biliary obstruction [4–6]. Unresectable malignant gastric outlet obstruction, a significant therapeutic challenge, is now addressed using minimally invasive techniques such as laparoscopic procedures, endoscopic stenting (ES), and EUS-guided gastroenterostomy (EUS-GE). EUS-GE combines the benefits of ES's minimally invasive nature with the durability of surgical solutions, providing a promising alternative for palliation as presented by Fugazza et al. [7]. Similarly, EUS-guided choledochoduodenostomy (EUS-CDS) with electrocautery-enhanced lumen-apposing metal stents (EC-LAMS) is redefining the management of distal malignant biliary obstructions. Traditionally reserved for ERCP failures, EUS-CDS is now being positioned as a first-line intervention in both palliative and preoperative settings, reducing the risk of iatrogenic pancreatitis and post-operative complications. This innovation challenges ERCP's dominance as underlined in the review by Guilmoteau et al. [8], urging further comparative studies to cement its clinical role. Biliary drainage in patients with surgically altered anatomy (SAA) poses unique challenges. An Italian survey highlighted in this Issue reveals variability in clinical practices, especially for Roux-en-Y reconstructions [9]. While EUS-guided interventions are gaining traction as rescue modalities [10,11], percutaneous drainage remains a common first-line option. Our findings emphasize the need for standardized protocols and greater collaboration between tertiary and non-tertiary centers to improve outcomes.

Apart from biliary drainage, EUS-guided drainage has become a cornerstone in managing pancreatic fluid collections (PFCs), particularly infected pancreatic necrosis [12,13]. However, unresolved questions remain about timing, stent selection, and procedural techniques. Lumen-apposing metal stents (LAMs) offer direct access for necrosectomy but are associated with significant complications. This issue delves into these debates, providing a comprehensive analysis of current practices and identifying areas for further research [14]. In particular, complications like arterial bleeding, a potentially life-threatening issue during



Received: 18 February 2025

Revised: 21 February 2025

Accepted: 16 March 2025

Published: 20 March 2025

Citation: Spadaccini, M.; Fugazza, A. Latest Advances in Pancreatobiliary Endoscopy. *Medicina* **2025**, *61*, 550. <https://doi.org/10.3390/medicina61030550>

Copyright: © 2025 by the authors. Published by MDPI on behalf of the Lithuanian University of Health Sciences. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

endoscopic necrosectomy, are also explored. A featured case study [15] demonstrates the effectiveness of the Coagrasper in achieving hemostasis, while cautioning against overuse to avoid exacerbating vessel damage. This case underscores the importance of precision and judicious tool application in complex scenarios.

Other benign conditions have also benefited from the EUS revolution. Acute cholecystitis in patients unfit for surgery necessitates innovative drainage solutions. The review by Troncone et al. [16] highlights transpapillary and EUS-guided approaches, showcasing LAMS technology's role in enabling not only decompression but also cholecystoscopy-guided interventions such as gallstone lithotripsy. Despite these advancements, uncertainties remain, including the comparative efficacy of different techniques and the long-term outcomes of EUS-guided methods.

Finally, the Issue also addresses longstanding challenges like managing complex biliary stones [17–21]. Choledocholithiasis, a common indication for ERCP, often involves difficult stones requiring advanced techniques such as large-balloon papillary dilation, mechanical lithotripsy, and laser lithotripsy. The narrative review by Manti et al. [22] synthesizes current evidence to offer a roadmap for effective management, emphasizing tailored approaches to optimize therapeutic outcomes.

This Special Issue highlights the vibrant innovation and collaboration that propel the field of biliopancreatic endoscopy forward. From refining diagnostic tools to pioneering therapeutic interventions, the included articles provide a comprehensive snapshot of the latest advancements. As the field evolves, continued emphasis on rigorous research, multidisciplinary collaboration, and patient-centered care remains essential. We hope this collection inspires and informs practitioners and researchers committed to advancing this critical area of medicine.

Author Contributions: Conceptualization, M.S. and A.F.; methodology, M.S. and A.F.; validation, M.S. and A.F.; investigation, M.S. and A.F.; writing—original draft preparation, M.S. and A.F.; writing—review and editing, M.S. and A.F.; visualization, M.S. and A.F.; supervision, M.S. and A.F. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Mangiavillano, B.; Crinò, S.F.; Facciorusso, A.; Di Matteo, F.; Barbera, C.; Larghi, A.; Rizzatti, G.; Carrara, S.; Spadaccini, M.; Auriemma, F.; et al. Endoscopic ultrasound-guided fine-needle biopsy with or without macroscopic on-site evaluation: A randomized controlled noninferiority trial. *Endoscopy* **2023**, *55*, 129–137. [[CrossRef](#)] [[PubMed](#)]
2. Facciorusso, A.; Arvanitakis, M.; Crinò, S.F.; Fabbri, C.; Fornelli, A.; Leeds, J.; Archibugi, L.; Carrara, S.; Dhar, J.; Gkolfakis, P.; et al. Endoscopic ultra-sound-guided tissue sampling: European Society of Gastrointestinal Endoscopy (ESGE) Technical and Technology Review. *Endoscopy* **2025**, *ahead of print*. [[CrossRef](#)] [[PubMed](#)]
3. Dhar, J.; Samanta, J.; Nabi, Z.; Aggarwal, M.; Conti Bellocchi, M.C.; Facciorusso, A.; Frulloni, L.; Crinò, S.F. Endoscopic Ultrasound-Guided Pancreatic Tissue Sampling: Lesion Assessment, Needles, and Techniques. *Medicina* **2024**, *60*, 2021. [[CrossRef](#)] [[PubMed](#)]
4. van der Merwe, S.W.; van Wanrooij, R.L.J.; Bronswijk, M.; Everett, S.; Lakhtakia, S.; Rimbass, M.; Hucl, T.; Kunda, R.; Badaoui, A.; Law, R.; et al. Therapeutic endoscopic ultrasound: European Society of Gastrointestinal Endoscopy (ESGE) Guideline. *Endoscopy* **2022**, *54*, 185–205. [[CrossRef](#)] [[PubMed](#)]
5. van Wanrooij, R.L.J.; Bronswijk, M.; Kunda, R.; Everett, S.M.; Lakhtakia, S.; Rimbass, M.; Hucl, T.; Badaoui, A.; Law, R.; Arcidiacono, P.G.; et al. Therapeutic endoscopic ultrasound: European Society of Gastrointestinal Endoscopy (ESGE) Technical Review. *Endoscopy* **2022**, *54*, 310–332. [[CrossRef](#)] [[PubMed](#)]
6. Spadaccini, M.; Binda, C.; Fugazza, A.; Repici, A.; Tarantino, I.; Fabbri, C.; Cugia, L.; Anderloni, A.; On Behalf of the Interventional Endoscopy Amp Ultra Sound I-Eus Group. Informed Consent for Endoscopic Biliary Drainage: Time for a New Paradigm. *Medicina* **2022**, *58*, 331. [[CrossRef](#)] [[PubMed](#)] [[PubMed Central](#)]

7. Fugazza, A.; Andreozzi, M.; Asadzadeh Aghdaei, H.; Insausti, A.; Spadaccini, M.; Colombo, M.; Carrara, S.; Terrin, M.; De Marco, A.; Franchellucci, G.; et al. Management of Malignant Gastric Outlet Obstruction: A Comprehensive Review on the Old, the Classic and the Innovative Approaches. *Medicina* **2024**, *60*, 638. [[CrossRef](#)] [[PubMed](#)] [[PubMed Central](#)]
8. Guilmoteau, T.; Albouys, J.; Taibi, A.; Legros, R.; Schaefer, M.; Jacques, J. Will Endoscopic-Ultrasound-Guided Choledocoduodenostomy with Electrocautery-Enhanced Lumen-Apposing Metal Stent Placement Replace Endoscopic Retrograde Cholangiopancreatography When Treating Distal Malignant Biliary Obstructions? *Medicina* **2024**, *60*, 220. [[CrossRef](#)]
9. Mauro, A.; Binda, C.; Fugazza, A.; Vanella, G.; Mirante, V.G.; Mazza, S.; Scalvini, D.; Tarantino, I.; Fabbri, C.; Anderloni, A.; et al. Italian Survey on Endoscopic Biliary Drainage Approach in Patients with Surgically Altered Anatomy. *Medicina* **2024**, *60*, 472. [[CrossRef](#)] [[PubMed](#)] [[PubMed Central](#)]
10. Spadaccini, M.; Giachetto, C.M.; Fiacca, M.; Colombo, M.; Andreozzi, M.; Carrara, S.; Maselli, R.; Saccà, F.; De Marco, A.; Franchellucci, G.; et al. Endoscopic Biliary Drainage in Surgically Altered Anatomy. *Diagnostics* **2023**, *13*, 3623. [[CrossRef](#)]
11. Mazza, S.; Masciangelo, G.; Mauro, A.; Scalvini, D.; Torello Viera, F.; Bardone, M.; Veronese, L.; Rovedatti, L.; Agazzi, S.; Strada, E.; et al. Endoscopic Ultrasound-Guided Hepaticogastrostomy in Malignant Biliary Obstruction: A Comprehensive Review on Technical Tips and Clinical Outcomes. *Diagnostics* **2024**, *14*, 2644. [[CrossRef](#)] [[PubMed](#)] [[PubMed Central](#)]
12. Suresh Kumar, V.C.; Singh, S.; Moond, V.; Mohan, B.P.; Aswath, G.; Khan, H.M.A.; Sapkota, B.; Adler, D.G. Safety and efficacy of lumen-apposing metal stents for endoscopic ultrasound-guided drainage of pancreatic fluid collections: A systematic review and meta-analysis. *Endoscopy* **2025**, *57*, 282–290. [[CrossRef](#)] [[PubMed](#)]
13. Tsujimae, M.; Saito, T.; Sakai, A.; Takenaka, M.; Omoto, S.; Hamada, T.; Ota, S.; Shiomi, H.; Takahashi, S.; Fujisawa, T.; et al. Necrosectomy and its timing in relation to clinical outcomes of EUS-guided treatment of walled-off pancreatic necrosis: A multicenter study. *Gastrointest. Endosc.* **2024**, *ahead of print*. [[CrossRef](#)] [[PubMed](#)]
14. Binda, C.; Fabbri, S.; Perini, B.; Boschetti, M.; Coluccio, C.; Giuffrida, P.; Gibiino, G.; Petraroli, C.; Fabbri, C. Endoscopic Ultrasound-Guided Drainage of Pancreatic Fluid Collections: Not All Queries Are Already Solved. *Medicina* **2024**, *60*, 333. [[CrossRef](#)] [[PubMed](#)] [[PubMed Central](#)]
15. Ito, Y.; Okuno, M.; Iwata, K.; Kawade, M.; Iwasa, Y.; Sugiyama, A.; Nishigaki, Y.; Tomita, E. The Usefulness and Reliability of Coagrasper for Artery Bleeding during Endoscopic Necrosectomy. *Medicina* **2023**, *59*, 1861. [[CrossRef](#)] [[PubMed](#)] [[PubMed Central](#)]
16. Troncone, E.; Amendola, R.; Moscardelli, A.; De Cristofaro, E.; De Vico, P.; Paoluzi, O.A.; Monteleone, G.; Perez-Miranda, M.; Del Vecchio Blanco, G. Endoscopic Gallbladder Drainage: A Comprehensive Review on Indications, Techniques, and Future Perspectives. *Medicina* **2024**, *60*, 633. [[CrossRef](#)] [[PubMed](#)] [[PubMed Central](#)]
17. Troncone, E.; Mossa, M.; De Vico, P.; Monteleone, G.; Del Vecchio Blanco, G. Difficult Biliary Stones: A Comprehensive Review of New and Old Lithotripsy Techniques. *Medicina* **2022**, *58*, 120. [[CrossRef](#)] [[PubMed](#)] [[PubMed Central](#)]
18. Manes, G.; Paspatis, G.; Aabakken, L.; Anderloni, A.; Arvanitakis, M.; Ah-Soune, P.; Barthet, M.; Domagk, D.; Dumonceau, J.M.; Gigot, J.F.; et al. Endoscopic management of common bile duct stones: European Society of Gastrointestinal Endoscopy (ESGE) guideline. *Endoscopy* **2019**, *51*, 472–491. [[CrossRef](#)] [[PubMed](#)]
19. Jin, Z.; Wei, Y.; Tang, X.; Shen, S.; Yang, J.; Jin, H.; Zhang, X. Single-operator peroral cholangioscope in treating difficult biliary stones: A systematic review and meta-analysis. *Dig. Endosc.* **2019**, *31*, 256–269. [[CrossRef](#)] [[PubMed](#)]
20. McCarty, T.R.; Gulati, R.; Rustagi, T. Efficacy and safety of peroral cholangioscopy with intraductal lithotripsy for difficult biliary stones: A systematic review and meta-analysis. *Endoscopy* **2021**, *53*, 110–122. [[CrossRef](#)] [[PubMed](#)]
21. Anderloni, A. Difficult common bile duct stones: Still “difficult” or just... “different”? *Endoscopy* **2020**, *52*, 429–430. [[CrossRef](#)] [[PubMed](#)]
22. Manti, M.; Shah, J.; Papaefthymiou, A.; Facciorusso, A.; Ramai, D.; Tziatzios, G.; Papadopoulos, V.; Paraskeva, K.; Papanikolaou, I.S.; Triantafyllou, K.; et al. Endoscopic Management of Difficult Biliary Stones: An Evergreen Issue. *Medicina* **2024**, *60*, 340. [[CrossRef](#)] [[PubMed](#)] [[PubMed Central](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.