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EDITORIAL

Combined endoscopic and radiologic intervention for major bile duct injuries

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Serious complications continue to accompany laparoscopic cholecystectomy despite widespread emphasis on the principles of safe cholecystectomy.[1] The Achilles heel remains failure to achieve adequate visualisation of biliary anatomy, resulting in major bile duct injury (BDI), one of the most devastating complications of abdominal surgery.[2] Despite focus on the critical view of safety technique and the introduction of robotic-assisted cholecystectomy, this complication has not disappeared.[3] Two recent large population-based analyses of Medicare patients found significantly higher rates of major BDI after robotic-assisted compared with conventional laparoscopic cholecystectomy, with the increased risk persisting across low-, intermediate- and high-risk patients.[4,5] These findings reinforce that technological sophistication alone cannot compensate for errors in anatomical identification and safe operative technique.

Traditionally, repair of major BDIs has been the domain of hepatobiliary surgeons, with Roux-en-Y hepaticojejunostomy regarded as the gold standard because of excellent long-term results.[6,7] During the past two decades, however, advances in therapeutic endoscopy and interventional radiology have, when combined, created an alternative minimally invasive strategy for selected patients with major BDIs, extending treatment beyond simple biliary leaks to complex injuries with loss of ductal continuity.

In this issue of the *South African Journal of Surgery*, Bhana and colleagues[8] report the outcomes of 14 consecutive patients with major BDIs managed definitively by endoscopic techniques, including a combined endoscopic and radiologic approach (CERA) using the "Lasso" method[9] with a snare-assisted endoscopic-radiological rendezvous technique when complete transection and loss of ductal continuity had occurred. Seven patients underwent conventional endoscopic stenting, while seven required CERA. Technical and clinical success was achieved in all patients, procedure-related complications were mild, and no biliary strictures developed during a median follow-up of 22 months. This series builds on the authors' earlier two-patient report[10] and on three other published cohorts: Fiocca et al.[11] (22 patients), Donatelli et al.[12] (60 patients) and Schreuder et al.[13] from the Academic Medical Centre, Amsterdam (47 patients). Although this cohort is relatively small, these results represent a substantial single-centre experience of definitive combined endoscopic and radiological stenting of complex bile duct injuries.

The importance of this study lies less in the technical success of the procedures than in the challenge it poses to established treatment algorithms. By adopting the McMahon definition of MBDI, the authors focus specifically on severe injuries, including complete transections and extensive circumferential defects, rather than on minor bile leaks for which endoscopic therapy is already well established.[14] The question addressed is therefore not whether endoscopy can manage bile leaks, but whether CERA can provide definitive treatment for injuries traditionally considered to require operative biliary reconstruction.[8-12]

The principal innovation is the structured application of CERA. When guidewire access cannot be achieved from either the endoscopic or percutaneous route alone, the rendezvous technique establishes biliary continuity by combining both approaches. This permits re-establishing ductal continuity using covered self-expanding metal stents to bridge complete transections and even tissue loss, expanding the range of injuries potentially amenable to minimally invasive treatment. The study demonstrates that anatomical discontinuity should no longer automatically exclude consideration for endoscopic therapy in appropriately selected patients when managed by experienced multidisciplinary teams.

The clinical implications are particularly relevant for patients who present late with bile leakage, sepsis and inflammation, circumstances in which immediate reconstructive surgery carries substantially increased operative risk and is best deferred until the sepsis has been treated successfully and bile leak has effectively been controlled by external drainage.[15] Applying CERA, internalisation of biliary drainage offers recognised physiological advantages over prolonged external drainage, including preservation of bile salts, improved nutritional recovery, avoidance of electrolyte losses and earlier discharge from hospital. At the same time, however, these benefits must be balanced against the need for repeated endoscopic interventions and prolonged stent surveillance, particularly in patients with complete transections who required longer treatment than those with partial injuries.

The study also reinforces the importance of multi-disciplinary management. Successful treatment depends

not only on advanced endoscopic expertise, but also on careful radiological imaging, close collaboration between hepatobiliary surgeons, interventional radiologists and therapeutic endoscopists, and meticulous patient selection. Ultimately, these resources are available only in highly specialised centres and should temper enthusiasm for widespread adoption of CERA before adequate expertise exists.

Several limitations deserve emphasis. The study is retrospective, includes only 14 highly selected patients, originates from a single expert centre and lacks a contemporaneous surgical comparison group. Follow-up, although encouraging, remains relatively short for an intervention intended to replace hepaticojejunostomy, where excellent durability extending over decades has been well documented. Consequently, these findings should be regarded as proof of concept rather than definitive evidence of superiority.

Nevertheless, this study represents an important contribution to the evolving management of MBDIs. Rather than replacing surgery, CERA broadens the therapeutic options available to multidisciplinary HPB teams and demonstrates that, in selected patients, definitive minimally invasive treatment is achievable even after complete bile duct transection. Larger prospective multicentre studies as in the Donatelli analysis[12] with long-term follow-up, standardised outcome measures and direct comparison with surgical reconstruction will determine whether this promising approach will modify future treatment algorithms and provide a realistic and durable alternative to surgical reconstruction in patients who have major bile duct injuries with ductal discontinuity and tissue loss.

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REFERENCES

1. Krige JE, Jonas E, Hofmeyr S. Instilling a culture of safety for laparoscopic cholecystectomy. S Afr J Surg. 2016;54(3):2-5. PMID: 28240459.
2. Hofmeyr S, Krige JE, Bornman PC, Beningfield SJ. A cost analysis of operative repair of major laparoscopic bile duct injuries. S Afr Med J. 2015;105(6):454-7. https://doi.org/10.7196/SAMJ.9038.
3. Lindemann J, Jonas E, Kotze U, Krige JE. An analysis of early postoperative complications following biliary reconstruction of major bile duct injuries using the Modified Accordion and Anatomic, Timing of and Mechanism classifications. Surg Open Sci. 2019;1(1):2-6. https://doi.org/10.1016/j.sopen.2019.01.001.
4. Kalata S, Thumma JR, Norton EC, Dimick JB, Sheetz KH. Comparative safety of robotic-assisted vs laparoscopic cholecystectomy. JAMA Surg. 2023;158(11):1123-31. https://doi.org/10.1001/jamasurg.2023.4389.
5. Mullens CL, Sheskey S, Thumma JR, et al. Patient complexity and bile duct injury after robotic-assisted vs laparoscopic cholecystectomy. JAMA Netw Open. 2025;8(3):e251705. https://doi.org/10.1001/jamanetworkopen.2025.1705.
6. Lindemann J, Jonas E, Kotze U, Krige JEJ. Evolution of bile duct repair in a low and middle-income country (LMIC): A comparison of diagnosis, referral, management and outcomes in repair of bile duct injury after laparoscopic cholecystectomy from 1991 to 2004 and 2005-2017. HPB (Oxford). 2020;22(3):391-7. https://doi.org/10.1016/j.hpb.2019.07.009.
7. Lindemann J, Krige JEJ, Kotze U, Jonas E. Factors leading to loss of patency after biliary reconstruction of major laparoscopic cholecystectomy bile duct injuries: An observational study with long-term outcomes. HPB (Oxford). 2020;22(11):1613-21. https://doi.org/10.1016/j.hpb.2020.02.010.
8. Bhana M, Creamer D, Kloppers C, et al. Beyond the scope: Endoscopic approach for the definitive management of major bile duct injuries. S Afr J Surg. 2026;64(3):XXX
9. Ödemiş B, Shorbagi A, Köksal AŞ, et al. The "Lasso" technique: Snare-assisted endoscopic-radiological rendezvous technique for the management of complete transection of the main bile duct. Gastrointest Endosc. 2013;78(3):554-6. https://doi.org/10.1016/j.gie.2013.04.002.
10. Lindemann J, Kloppers C, Burmeister S, Bernon M, Jonas E. Mind the gap! Extraluminal percutaneous-endoscopic rendezvous with a self-expanding metal stent for restoring continuity in major bile duct injury: A case series. Int J Surg Case Rep. 2019;60:340-4. https://doi.org/10.1016/j.ijscr.2019.06.059.
11. Fiocca F, Salvatori FM, Fanelli F, et al. Complete transection of the main bile duct: Minimally invasive treatment with an endoscopic-radiologic rendezvous. Gastrointest Endosc. 2011;74(6):1393-8. https://doi.org/10.1016/j.gie.2011.07.045.
12. Donatelli G, Cereatti F, Dhumane P, et al. Long-term outcomes of combined endoscopic-radiological approach for the management of complete transection of the biliary tract. J Gastrointest Surg. 2022;26(9):1873-80. https://doi.org/10.1007/s11605-022-05365-2.
13. Schreuder AM, Booij KAC, de Reuver PR, et al. Percutaneous-endoscopic rendezvous procedure for the management of bile duct injuries after cholecystectomy: Short- and long-term outcomes. Endoscopy. 2018;50(6):577-87. https://doi.org/10.1055/s-0043-123935.
14. Chinnery GE, Krige JE, Bornman PC, et al. Endoscopic management of bile leaks after laparoscopic cholecystectomy. S Afr J Surg. 2013;51(4):116-21.
15. Krige JE, Bornman PC, Kahn D. Bile leaks and sepsis: Drain now, fix later. Arch Surg. 2010;145(8):763. https://doi.org/10.1001/archsurg.2010.154.