



# Laparoscopic Cholecystectomy-Induced Complex Common Bile Duct Injury: Will Rescue ERCP Help?

Amol Vadgaonkar<sup>1</sup> Sanil Parekh<sup>1</sup> Nagesh Kamat<sup>1</sup> Gaurav Patil<sup>1</sup> Ankit Dalal<sup>1</sup> Sehajad Vora<sup>1</sup>  
Swara Pendse<sup>1</sup> Amit Mayo<sup>1</sup>

<sup>1</sup>Institute of Gastrosciences, Sir H. N. Reliance Foundation Hospital and Research Centre, Mumbai, Maharashtra, India

**Address for correspondence** Gaurav Patil, PhD, Institute of Gastrosciences, Sir H. N. Reliance Foundation Hospital and Research Centre, Girgaon, Mumbai, Maharashtra, 400004, India (e-mail: gauravkpatil@gmail.com).

J Digest Endosc

## Abstract

A 33-year-old woman presented for laparoscopic cholecystectomy (LC)-induced accidental transection of the common bile duct at the level of confluence and common hepatic duct cutoff (E5–Bismuth type 5 injury) along with transected indwelling biliary stent hanging in the right posterior duct (RPD). At endoscopic retrograde cholangiopancreatography (ERCP), the distal fragment was removed. The RPD stent was cannulated across and retrieved, followed by three plastic stents in the right and left hepatic duct. Prompt referral of a bile duct injury during LC to a specialized center with timely ERCP saved the day and averted the need for surgical intervention.

## Keywords

- ▶ adverse event
- ▶ CBD injury
- ▶ ERCP
- ▶ laparoscopic cholecystectomy

A 33-year-old woman presented with abdominal pain, jaundice, and fever. She had choledocholithiasis with cholelithiasis and cholangitis. Two months ago, she underwent endoscopic retrograde cholangiopancreatography (ERCP) for common bile duct (CBD) stone extraction and 7F CBD stenting. After 2 days, the patient underwent elective laparoscopic cholecystectomy (LC). During surgery, there was an accidental CBD injury, so a drain was placed at the gallbladder (GB) fossa. The procedure was abandoned, and the patient was referred. Magnetic resonance cholangiopancreatography (MRCP) showed chronic calculous cholecystitis with few metallic clips at GB neck, fractured CBD stent, and CBD injury at the level of porta. The patient had persistent high-grade bile leak from the operated site (300 mL/day). A computed tomography (CT) scan of the abdomen showed discontinuity of CBD and few clips at the confluence. The proximal end of the stent fragment was seen in the right sectoral duct, and the distal end was seen in the D2/D3 junction (Strasberg E5 - Bismuth type 5 bile duct injury).

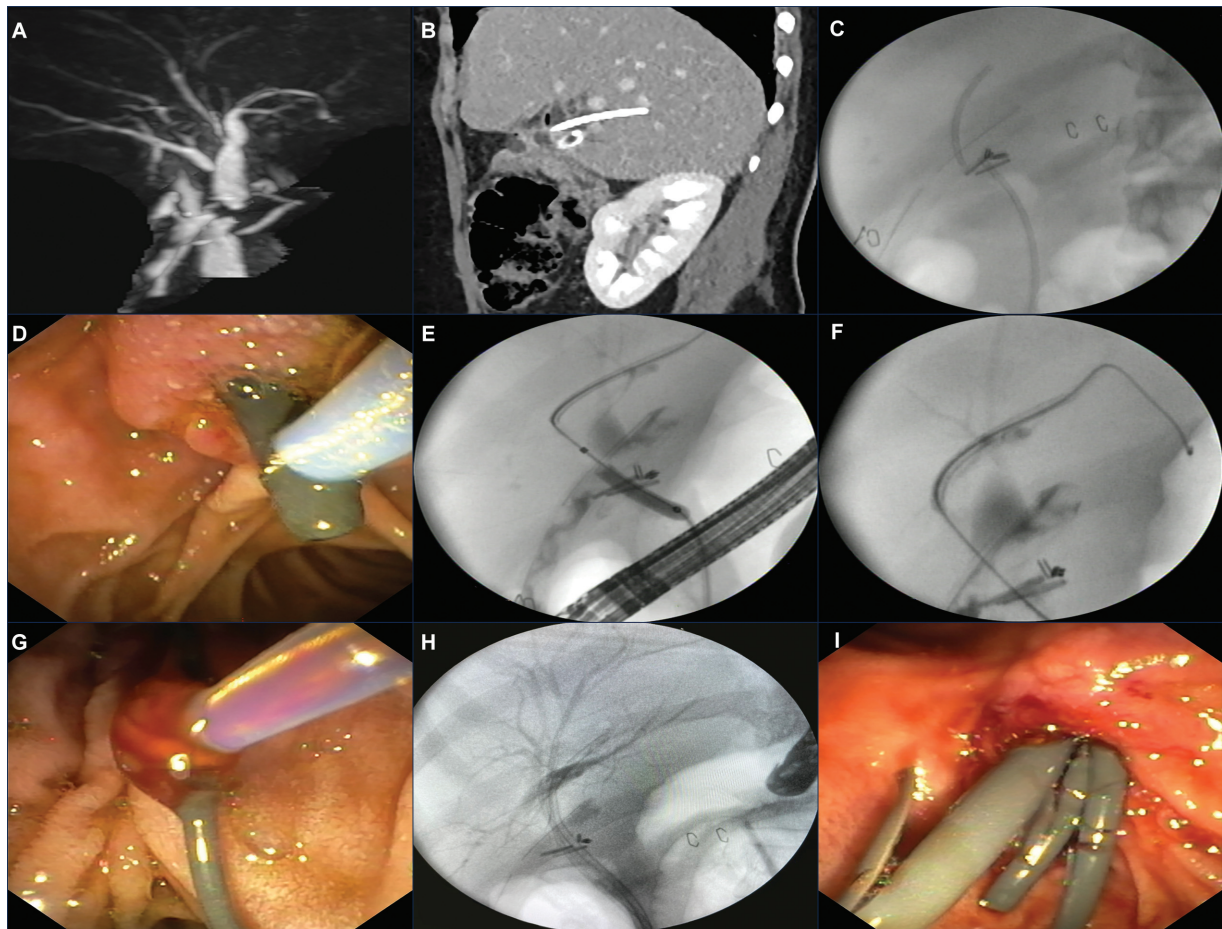
After selective wire-guided cannulation of the CBD at ERCP, a distal fragment of the CBD stent was removed with a snare (→Fig. 1A–I). A hurricane biliary balloon dilatation

catheter (Boston Scientific, United States) was used to enter and dislodge the clipped CBD site. A guidewire (Dreamwire, Boston Scientific) was then passed through the clipped segment of the CBD into the right posterior duct. Using an endoscopic mucosal resection snare (SD-221L-25, Olympus, United States), the proximal end of the fragment was removed. The contrast was injected, and there was a near-complete cutoff of contrast at the confluence. Selectively, the guidewires were placed in the right anterior, right posterior, and left hepatic ducts. A 10F plastic stent (Endotech, India) was in the left hepatic duct and 2 × 7F plastic stents (Endotech) were placed in the right anterior and right posterior ducts, respectively. Following this patient was followed up for drain output, which gradually reduced. At follow-up (3 weeks), her total bilirubin had normalized from 56.4 to 18.8 mmol/L. At 8 weeks, she was asymptomatic and her bile leak had stopped. Her stents were upgraded from 7F to three 10F plastic stents as per the Costamagna protocol.<sup>1</sup> The next plan for her is to undergo routine ERCP with a check cholangiogram, post which she will be given a stent-free trial.

DOI <https://doi.org/10.1055/s-0044-1787127>.  
ISSN 0976-5042.

© 2024. The Author(s).

This is an open access article published by Thieme under the terms of the Creative Commons Attribution License, permitting unrestricted use, distribution, and reproduction so long as the original work is properly cited. (<https://creativecommons.org/licenses/by/4.0/>)  
Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India



**Fig. 1** (A) Magnetic resonance cholangiopancreatography (MRCP) showing complete transection of common bile duct (CBD) near confluence. (B) Computed tomography (CT) showing sagittal view of fragmented CBD stent. (C) Fluoroscopy showing proximal and distal fragmented stents surrounded by surgical clips. (D) Endoscopy showing the distal end of the fragment being removed. (E) Hurricane biliary balloon dilatation at the clipped site of CBD. (F) Fluoroscopy showing contrast being injected and near-complete cutoff of contrast below the confluence. (G) Endoscopy showing proximal stent being removed by endoscopic mucosal resection (EMR) snare. (H) Fluoroscopy showing plastic stents being placed in the right and left hepatic ducts. (I) Endoscopy showing placement of three plastic stents.

Traumatic bile duct injuries at index LC are a serious complication<sup>2</sup> that need prompt diagnosis and management; when left unidentified can lead to strictures, cholangitis, hepatic failure, and an increase in all-cause mortality. The occurrence of bile leak following LC ranges from 0.3 to 2%.<sup>3,4</sup>

For radiological imaging, CT may be nonspecific at times but MRCP helps in detailed structural assessment of the biliary system and to plan management maneuvers.<sup>5</sup> Intraoperative cholangiography is costly during LC but will help identify the biliary anatomy for operative dissection before duct transection.

ERCP with stenting is the procedure of choice for treating post-LC bile duct leaks.<sup>6</sup> Patients should be referred to specialized centers with better resources. When performed by experts in the field, ERCP offers the best chance of cure if performed early. For most of the LC-related injuries, surgical intervention might be necessary. For type E injuries, had the ERCP failed, the patient would have been referred for reconstruction with Roux-en-Y hepaticojejunostomy. Some cases may need future liver transplantation. This case highlights that prompt referral of a bile duct injury during LC to a specialized center with timely ERCP prevented the need for surgical intervention.

#### Authors' Contributions

N.K., S.P., and A.V.: study concept, manuscript preparation, and manuscript review. A.M. and S.V. were involved in performing the case. G.P., S.P., A.D., A.V., and Sw.P.: clinical management of case and manuscript review. A.M.: critical final review of the manuscript. All authors approved final version of the manuscript.

#### Consent

Patient's written consent was obtained for the publication of the case details.

#### Funding

None declared.

#### Conflict of Interest

None declared.

#### References

- 1 Costamagna G, Tringali A, Mutignani M, et al. Endotherapy of postoperative biliary strictures with multiple stents: results after

- more than 10 years of follow-up. *Gastrointest Endosc* 2010;72(03):551–557
- 2 Albasini JL, Aledo VS, Dexter SP, Marton J, Martin IG, McMahon MJ. Bile leakage following laparoscopic cholecystectomy. *Surg Endosc* 1995;9(12):1274–1278
  - 3 Flum DR, Koepsell T, Heagerty P, Sinanan M, Dellinger EP. Common bile duct injury during laparoscopic cholecystectomy and the use of intraoperative cholangiography: adverse outcome or preventable error? *Arch Surg* 2001;136(11):1287–1292
  - 4 Karanikas M, Bozali F, Vamvakou V, et al. Biliary tract injuries after lap cholecystectomy—types, surgical intervention and timing. *Ann Transl Med* 2016;4(09):163
  - 5 Reddy S, Lopes Vendrami C, Mittal P, Borhani AA, Moreno CC, Miller FH. MRI evaluation of bile duct injuries and other post-cholecystectomy complications. *Abdom Radiol (NY)* 2021;46(07):3086–3104
  - 6 Pencev D, Brady PG, Pinkas H, Boulay J. The role of ERCP in patients after laparoscopic cholecystectomy. *Am J Gastroenterol* 1994;89(09):1523–1527