International Surgery Journal
Pratap MS et al. Int Surg J. 2023 Jun;10(6):1128-1130
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20231754

Case Report

Iatrogenic bile duct injury: a stitch in time

Mangipudi Surya Pratap, Ravi Ranjan, Gyan Saurabh, Ranvir Singh

Department of Surgery, Lady Hardinge Medical College, New Delhi, India

Received: 19 April 2023
Accepted: 16 May 2023

***Correspondence:**
Dr. Mangipudi Surya Pratap,
E-mail: pratap.mangipudi97@gmail.com

ABSTRACT

Intraoperative bile duct injuries often are difficult to be identified intraoperatively can lead to a variety of complications and require complex surgical procedures for their definitive treatment. With multiple complicated treatment options, these injuries become a therapeutic challenge. We present a case of a 49-year-old lady diagnosed with symptomatic gallstone disease who underwent open cholecystectomy in an outside hospital, during which she had an iatrogenic bile duct injury which was diagnosed postoperatively. She was promptly referred to a higher centre. After investigations, the patient underwent a Roux-en-Y hepaticojejunostomy with a subhepatic drain. The patient was discharged post-successful recovery on post-op day 7. Iatrogenic bile duct injury can be missed intraoperatively in a cholecystectomy. The patient provides non-specific symptoms, and a high degree of suspicion can help in early diagnosis. Prompt treatment by an experienced hepatobiliary surgeon is necessary for the successful treatment of the condition.

Keywords: Iatrogenic bile duct injury, Cholecystectomy complications, Roux-en-Y hepaticojejunostomy

INTRODUCTION

The treatment of choice in a case of symptomatic gall stone disease is cholecystectomy.[1] The goal of the therapy is to prevent the recurrent episodes of biliary colic and eliminate the complications which might develop in a case of gallstone disease.[2] Complications of cholecystectomy include incisional hernia, wound infection, bile leak and biliary duct injury.[3,4]

Biliary tract injuries are one of the most dreaded complications occurring during a cholecystectomy. These are approximately 0.1 to 0.2 % while performing an open cholecystectomy with their incidence increasing with a laparoscopic approach 0.4-1.5%.[5] Multiple risk factors including anatomic variations of the biliary tree, patient condition, gall bladder pathology and surgeon-related factors are implied in biliary duct injuries.[6] There is difficulty in identifying iatrogenic bile duct injuries, which are recognised only 25-32% of the times.[7] Surgical treatment remains the main choice of treatment for bile duct injuries with a wide variety of surgical options and the requirement of an experienced hepatobiliary surgeon.[8]

This case report aim is to present a case of iatrogenic common bile duct injury during open cholecystectomy and the associated immediate surgical management.

CASE REPORT

We here present a case of a 49-year-old female who underwent open cholecystectomy with subhepatic drain placement under general anaesthesia in an outside peripheral hospital now presented with 200 ml bilious output from the drain for 8 hours since the time of surgery for which the patient was referred. There were no complaints of pain in the right upper abdomen, fever, abdominal distention. She has no known medical comorbidities. She had open bilateral tubal ligation previously 15 years ago. On the day of admission, the patient had a blood pressure of 112/72 mm of Hg with a pulse rate of 82/ min. Abdomen was non-distended with a

subhepatic drain in situ. The patient was kept nil per oral and a nasogastric tube was inserted and Foleys' urinary catheterisation was done. IV fluids and antibiotics were started. Blood parameters including Hb, TLC and Liver and Renal function tests were within normal limits.

An abdominal USG was done which showed the post-cholecystectomy status of the patient with a collection of 30 cc in the GB fossa without any ascites. An abdominal CECT was obtained which showed mild fluid in the GB fossa with a surgical clip in the mid-CBD with prominent proximal CHD and central intrahepatic biliary radicals. MRCP showed a linear CHD which is visualised for a length of 1.4 cm at the porta. CBD was not opacified, distal to hilum, for a length of approximately 3 cm, with visualisation of the distal-most (intraduodenal) segment of CBD. The visualised distal part of CBD appears normal in calibre. There's evidence of T1 hypo and T2 hyperintense fluid collection of a maximum depth of 1.3 cm seen in prehepatic and subhepatic spaces with minimal fat stranding with a subhepatic drain in situ. T2 hyperintense fluid collection measuring 2×2 cm with surrounding fat stranding is seen in the subcutaneous and intramuscular plane in the right hypochondrium.

Figure 1: Clipped CBD with transection of the CBD.

Figure 2: Complete transection of the CBD on MRCP.

With a provisional diagnosis of bile duct injury, the patient was taken up for relaparotomy and exploration was done within 48 hours of the presentation. Complete transection of the CHD was noted 0.5 cm distal from the hilar confluence. The flow of fresh bile was noted from both the left and right hepatic ducts. Distal CBD was found to be ligated with silk sutures. The rest of the visualised abdominal structures including the stomach, duodenum, jejunum, and transverse colon are within normal limits. The transacted CHD margins were freshened, and a biliary limb was created from 30 cm from the duodenojejunal flexure using a 55 mm stapler. A Roux-en-Y hepaticojejunostomy was done in a retro colic fashion using vicryl 3-0 sutures and a jejunal-jejunal iso-peristaltic side to side anastomosis was done using a 55 mm stapler. A subhepatic drain was inserted and fixed with silk 1-0 and a layered closure of the abdominal wall was done.

Postoperatively the patient was managed with strict vital monitoring and drain output. The patient had not developed any fever or jaundice. The patient drain was removed on post-op day 5 following minimal output over 3 days and discharged. The patient was regularly followed up every week and had no complaints.

DISCUSSION

Gallbladder stones are a common clinical condition occurring in the general population, women more than men, while most patients are asymptomatic, a small percentage of them develop gallstones related complications, and among them, a few develop serious complications (approximately 6%).[9] Iatrogenic bile duct injury remains an important complication of cholecystectomy, one of the most performed surgeries in the world.[10] Injury to bile duct can lead to biliary peritonitis, hepatic failure and death.[11,12] Biliary tract injuries are classified according to Bismuth scale, Strasberg scale, and Mattox scale.[13,14] Iatrogenic biliary tree injury presents with non-specific symptoms like nausea, vomiting, and abdominal pain and rarely with features of biliary peritonitis and cholangitis.[15] Early recognition of the injury is of utmost importance as immediate surgical treatment confers the best outcome. In case of non-feasibility of the repair, an intra-abdominal drain is to be placed and the patient is to be referred to a high-volume centre for further management.[16,17] Investigations should be directed at identifying the injury with a USG abdomen as the first investigation to assess the liver, diameter of CHD/CBD and any associated collections. CECT to identify associated vascular injury and identify the collection if any. MRCP with contrast (Gadolinium-based) is the gold standard for identifying biliary tract injury with the identification of active contrast leak.[18,19] Endoscopic procedures like sphincterotomy and stenting across the injured segment of CBD help in reducing the pressure in the biliary tree.[20] The goal of surgical treatment is to reconstruct the bile duct to allow flow to the alimentary canal. Surgeries include Roux-en-Y hepaticojejunostomy, end-to-end ductal biliary anastomosis, choledochal-duodenostomy,

Lahey hepaticojejunostomy, Heincke Mikulicz biliary pancreatic reconstruction. Hepatic jejunostomy remains the most common surgical procedure for iatrogenic biliary injuries with a success rate of > 90% in expert hands.[24]

CONCLUSION

Iatrogenic bile duct injury is a dreaded complication of cholecystectomy. Early diagnosis, prompt referral and early treatment are useful in decreasing the morbidity and mortality of the patient. Only 25-30% of bile duct injuries are diagnosed intraoperatively. MRCP with contrast is used for identifying the injury postoperatively. Surgical approaches include Roux-en-Y hepaticojejunostomy, end-to-end ductal anastomosis, and choledocho-duodenostomy with each of the procedures having its indication, advantages, and complications. Multiple factors determine the success of biliary reconstruction which include intra-abdominal infection, correct surgical technique, the experience of the surgeon, the timing of the repair and associated vascular injury impact the long-term outcome following bile duct repair.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Thistle JL, Cleary PA, Lachin JM, Tyor MP, Hersh T. The natural history of cholelithiasis: the National Cooperative Gallstone Study. Ann Intern Med. 1984;101:171-5.
2. Gutt C, Schläfer S, Lammert F. The treatment of gallstone disease. Deutsches Ärzteblatt Int. 2020;1.
3. Archer SB, Brown DW, Smith CD, Branum GD, Hunter JG. Bile duct injury during laparoscopic cholecystectomy: results of a national survey. Annals of Surgery. 2001;234(4):549-59.
4. Negi SS. Factors predicting advanced hepatic fibrosis in patients with postcholecystectomy bile duct strictures. Arch Surg. 2004;139(3):299.
5. DeAngelis N, Catena F, Memeo R, Coccolini F, Martínez-Pérez A, Romeo OM et al. 2020 WSES guidelines for the detection and management of bile duct injury during cholecystectomy. World J Emergency Surg. 2021;16(1):30.
6. Moghul F, Kashyap S. Bile duct injury. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2023.
7. Lau WY, Lai ECH, Lau SHY. Management of bile duct injury after laparoscopic cholecystectomy: a review. ANZ J Surg. 2010;80(1-2):75-81.
8. Feng X, Dong J. Surgical management for bile duct injury. BST. 2017;11(4):399-405.
9. Kuga D, Ebata T, Yokoyama Y, Igami T, Sugawara G, Mizuno T et al. Long-term survival after multidisciplinary therapy for residual gallbladder cancer with peritoneal dissemination: a case report. surg case rep. 2017;3(1):76.
10. Tanaja J, Lopez RA, Meer JM. Cholelithiasis. In: StatPearls. Treasure Island (FL): StatPearls Publishing. 2022.
11. Archer SB, Brown DW, Smith CD, Branum GD, Hunter JG. Bile duct injury during laparoscopic cholecystectomy: results of a national survey. Ann Surg. 2001;234(4):549-59.
12. Negi SS. Factors predicting advanced hepatic fibrosis in patients with postcholecystectomy bile duct strictures. Arch Surg. 2004;139(3):299.
13. Pellegrini CA, Thomas MJ, Way LW. Recurrent biliary stricture. Am J Surg. 1984;147(1):175-80.
14. Bismuth H, Majno PE. Biliary strictures: classification based on the principles of surgical treatment. World J Surg. 2001;25(10):1241-4.
15. Mattox KL, Feliciano DV, Moore EE. Trauma. 3rd ed. Stamford, CT: Applenton and Lange. 1996;515-9.
16. Pesce A, Palmucci S, La Greca G, Puleo S. Iatrogenic bile duct injury: impact and management challenges. Clin Exp Gastroenterol. 2019;12:121-8.
17. Stewart L. Iatrogenic biliary injuries. Surgical Clinics of North America. 2014;94(2):297-310.
18. De Reuver PR, Grossmann I, Busch OR, Obertop H, Van Gulik TM, Gouma DJ. Referral pattern and timing of repair are risk factors for complications after reconstructive surgery for bile duct injury. Annals of Surgery. 2007;245(5):763-70.
19. Latteri S, Malaguarnera G, Mannino M, Pesce A, Currò G, Tamburrini S et al. Ultrasound as a point of care in management of polytrauma and its complication. J Ultrasound. 2017;20(2):171-7.
20. Palmucci S, Mauro LA, La Scola S, Incarbone S, Bonanno G, Milone P et al. Magnetic resonance cholangiopancreatography and contrast-enhanced magnetic resonance cholangiopancreatography versus endoscopic ultrasonography in the diagnosis of extrahepatic biliary pathology. Radiol Med. 2010;115(5):732-46.
21. Rainio M, Lindström O, Udd M, Haapamäki C, Nordin A, Kylänpää L. Endoscopic therapy of biliary injury after cholecystectomy. Dig Dis Sci. 2018;63(2):474-80.
22. Tornqvist B, Stromberg C, Persson G, Nilsson M. Effect of intended intraoperative cholangiography and early detection of bile duct injury on survival after cholecystectomy: population based cohort study. BMJ. 2012;345(11-1):e6457.
23. Strasberg SM, Hertl M, Soper NJ. An analysis of the problem of biliary injury during laparoscopic cholecystectomy. J Am Coll Surg. 1995;180(1):101-25.
24. Pinsak A, Gielis M, Viscido G, Doniquian AM, Alvarez FA. Laparoscopic hepaticojejunostomy for the treatment of bile duct injuries in difficult scenarios (With video). Mini-invasive Surgery. 2022;6:47.

Cite this article as: Pratap MS, Ranjan R, Saurabh G, Singh R. Iatrogenic bile duct injury: a stitch in time. Int Surg J 2023;10:1128-30.