

# Iatrogenic Complete Common Bile Duct Transection in Open Cholecystectomy and Its Management: A Case Report

<sup>1</sup>Ritesh Ranjan, <sup>2</sup>Aman Kamra, <sup>3</sup>Sanjay Pandey, <sup>4</sup>Atul Jain, <sup>5</sup>Dhananjay Bansal, <sup>6</sup>Ghulam Jeelani

<sup>1</sup>Assistant Professor, <sup>2,4,5</sup> Resident, <sup>3,6</sup>Professor  
<sup>1, 2, 3,4,5,6</sup> Department Of General Surgery, Subharti Medical College, Meerut U.P. India

---

**Abstract:** The formation of gallstones in gall bladder is very common. It is now considered that approximately 10% to 15% of the adult population has gallstones. It is more frequent in women than men. Etiologies are various & include: age, sex, diet, sudden weight loss, etc. Although laparoscopic cholecystectomy is treatment of choice in cholelithiasis however, some surgeons still prefer a traditional open cholecystectomy. Generally a safe procedure with limited morbidity and mortality, open cholecystectomy does carry risk for potential complications. Perhaps the most morbid complication related to open cholecystectomy is injury to the common bile duct. We present the case of a 38 year old female admitted to our hospital with complete transection of common bile duct during open cholecystectomy which was successfully treated. In conclusion, CBD injury is not an uncommon complication of open cholecystectomy and should be suspected in a post-op case of cholecystectomy presenting as acute abdomen.

**Keywords:** Open cholecystectomy, Bile Duct Injury, Hepatojejunostomy, CBD Injury.

---

## I. INTRODUCTION

Bile duct injury (BDI) occurring during cholecystectomy has been proposed as the most serious and important cause of morbidity <sup>[1,2,3]</sup>. The complication rate of open cholecystectomy has been reported to range from 6-21%,<sup>[4]</sup> although this has likely decreased in the current era.<sup>[5]</sup> BDIs are a complex health problem and the effect on the patient's quality of life and overall survival is substantial <sup>[6]</sup>. The two most frequent scenarios are bile leak and bile duct obstruction. Bile leak scenario is easily recognized during the first postoperative week. Constant bile effusion is documented through surgical drains and surgical wounds. Patients usually complain. of diffuse abdominal pain, nausea, fever and impaired intestinal motility. In addition, bile collections, peritonitis, leukocytosis and mixed hyperbilirubinemia may be part of the clinical setting <sup>[6,7]</sup>. If not identified during the first postoperative week, patients have an insidious evolution with relapsing abdominal pain and cholangitis as well as bile collections. Although minor BDI, such as leakage from the cystic duct or common bile duct, can often be managed endoscopically, surgical reconstruction is needed for major BDI. <sup>[8,9]</sup> In most patients, repair of BDI consists of immediate or delayed Roux-en-Y hepaticojejunostomy. <sup>[10]</sup> In rare situations, management of these post-cholecystectomy BDIs requires hepatectomy. <sup>[11]</sup>

## II. CASE HISTORY

A 38 year old female patient came to our emergency with complaints of pain and distension of abdomen, yellowish discoloration of eyes, palms and soles & not able to pass feces and flatus since 1 week. Patient had history of open cholecystectomy done for symptomatic cholelithiasis under general anesthesia in any other nursing home. On post-operative day 2 subhepatic drain was removed and patient was discharged from the hospital. On post-operative day 5 patient developed pain and distension of abdomen, which gradually increased and on post-operative day 7 patient was brought to our hospital. Clinically she had jaundice and abdomen was distended, USG-Whole Abdomen showed large

collection in subhepatic space and CBD was not visualized after porta, A USG guided pig tail catheter was inserted through the drain site and nearly 2 litres of bile was drained on first day and 500 ml on subsequent day. 300-400ml of bile was drained by pig tail catheter daily.

Contrast was injected through the pig-tail catheter which showed normal visualization of both right and left hepatic duct & biliary radicles, which were normal in caliber and position. There was evidence of pooling of contrast in liver and no evidence of visualization of common hepatic duct and common bile duct.[FIGURE-1]

Patient was kept on conservative treatment and patient improved symptomatically; bilirubin level came to normal in 6 weeks. Patient was planned for a definitive treatment 8 weeks later. Rooftop incision was given.[FIGURE-2] Anatomy was very indistinct, after meticulous dissection proximal stump of Common Hepatic Duct was identified. Two stents were passed in right and left hepatic ducts and Roux en Y hepaticojejunostomy was done over stents. Post-op period was uneventful. Stent cholangiogram after 21 days showed free drainage of bile in jejunum with no extravasation.[FIGURE-3] After 21 days stents were removed. Patient recovered well and she is in regular follow up without any problem.

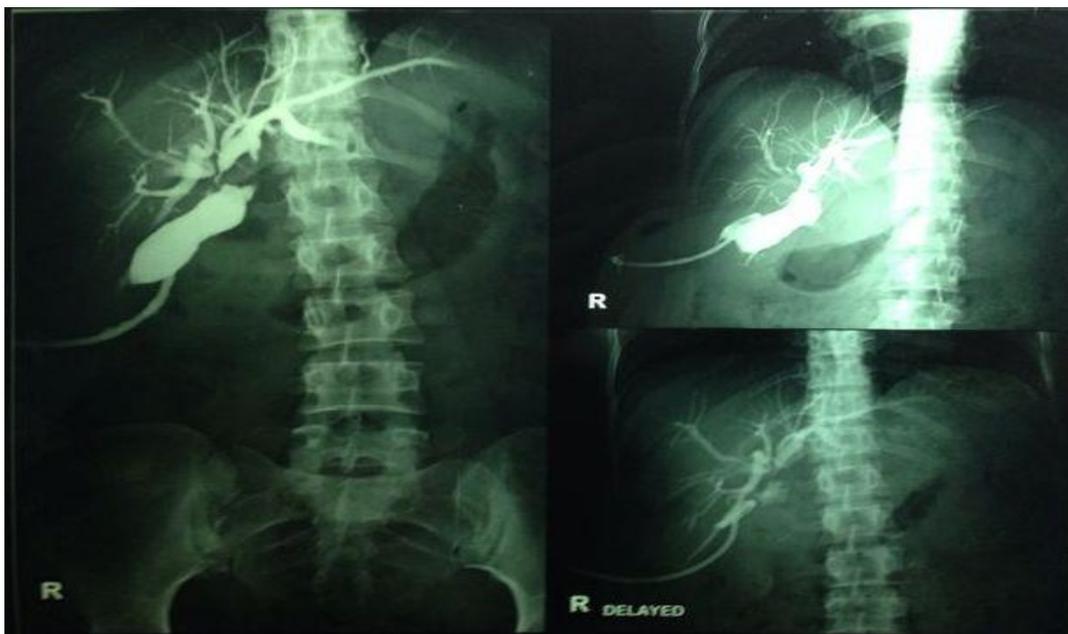


Figure 1. Contrast was injected through the pig-tail catheter evidence of pooling of contrast in liver and no evidence of visualization of common hepatic duct and common bile duct.



Figure 2. Rooftop incision with stents in situ



Figure 3. Stent cholangiogram showed free drainage of bile in jejunum with no extravasation

### III. DISCUSSION

Carl Langenbuch performed the first open cholecystectomy in 1882<sup>[12]</sup>. The complication rate of open cholecystectomy has been reported to range from 6-21%<sup>[4]</sup>. The single most important factor responsible for bile duct injuries is misinterpretation of the patient's anatomy. The majority (70–85%) of these injuries are not recognized during the operation. Combined bile duct and hepatic arterial (right hepatic artery or common hepatic artery) injuries carry a particularly bad prognosis, with higher postoperative morbidity and mortality and poorer outcomes after remedial surgery.<sup>[13]</sup> Bile duct injuries, substantially increase the economic burden on the patient, hospital, and community. Repair of a bile duct injury costs 4.5 to 26 times the cost of an uncomplicated open cholecystectomy and carries the risk of complications and even death.<sup>[13]</sup> Though the initial spike in the incidence of complications settled down as surgeons became more experienced, reports of major bile duct injuries, even in the hands of senior surgeons, continue to surface, suggesting that bile duct injuries following cholecystectomy will always remain a significant problem. The fundamental cause of BDI during cholecystectomy is removal of gallbladder without identifying the anatomy of the Calot's triangle, identifying common bile duct (CBD) and common hepatic duct (CHD) before transacting cystic duct is the fundamental measure to prevent iatrogenic bile duct injury. Three-step principle of "identifying-cutting-identifying" should be recommended during cholecystectomy, namely, identifying CBD and CHD before cutting the cystic duct and identifying the integrity of CBD and CHD again after removal of the gall bladder. However, early recognition (during operation or in the early post-operative period) improves the outcome and reduces the costs.<sup>[14]</sup> As in our case injury was identified early (first week) so better recovery. The timing of bile duct repair after bile duct injuries sustained during a cholecystectomy is still a matter of debate. Best chance of repair is when injury is detected during cholecystectomy or else done after 45 days of injury in form of Roux-en-Y hepaticojejunostomy has shown better results than done within 45 days.<sup>[15]</sup> In our case also repair was done after 8 weeks. According to Bismuth classification<sup>[16]</sup>, bile duct injury was of Type II and as per the Strasberg classification<sup>[17]</sup> the injury was of Type E 2.

### IV. CONCLUSION

CBD injury is not an uncommon complication of open cholecystectomy and should be suspected in a post-op case of cholecystectomy presenting as acute abdomen.

### REFERENCES

- [1] Thomson BN, Parks RW, Madhavan KK, Wigmore SJ, Garden OJ. Early specialist repair of biliary injury. *Br J Surg* 2006; 93: 216-220
- [2] Diamantis T, Tsigris C, Kiriakopoulos A, Papalambros E, Bramis J, Michail P, Felekouras E, Griniatsos J, Rosenberg T, Kalahanis N, Giannopoulos A, Bakoyiannis C, Bastounis E. Bile duct injuries associated with laparoscopic and open cholecystectomy: an 11-year experience in one institute. *Surg Today* 2005; 35: 841-84

- [3] Flum DR, Dellinger EP, Cheadle A, Chan L, Koepsell T. Intraoperative cholangiography and risk of common bile duct injury during cholecystectomy. *JAMA* 2003; 289: 1639-1644
- [4] A prospective analysis of 1518 laparoscopic cholecystectomies. The Southern Surgeons Club. *N Engl J Med*. Apr 18 1991;324(16):1073-8. [Medline].
- [5] McAneny D. Open cholecystectomy. *Surg Clin North Am*. Dec 2008;88(6):1273-94, ix. [Medline].
- [6] Flum DR, Cheadle A, Praeli C, Dellinger EP, Chan L. Bile duct injury during cholecystectomy and survival in medicare beneficiaries. *JAMA* 2003; 290: 2168-2173
- [7] Brooks DC, Becker JM, Connors PJ, Carr-Locke DL. Management of bile leaks following laparoscopic cholecystectomy. *Surg Endosc* 1993; 7: 292-295
- [8] Schmidt SC, Langrehr JM, Hintze RE, Neuhaus P. (2005) Longterm results and risk factors influencing outcome of major bile duct injuries following cholecystectomy. *Br J Surg* 92:76–82.
- [9] Vitale GC, Tran TC, Davis BR, Vitale M, Vitale D, Larson G. (2008) Endoscopic management of post-cholecystectomy bile duct strictures. *J Am Coll Surg* 206:918–923; discussion 924–925.
- [10] de Reuver PR, Busch OR, Rauws EA, Lameris JS, van Gulik TM, Gouma DJ. (2007) Longterm results of a primary end-to-end anastomosis in perioperative detected bile duct injury. *J Gastrointest Surg* 11:296–302.
- [11] Bismuth H, Majno PE. (2001) Biliary strictures: classification based on the principles of surgical treatment. *World J Surg* 25:1241–1244.
- [12] Bhattacharjee P. Bile duct injuries: Mechanism and prevention. *Indian J Surg*. 2005; 67:73–7.
- [13] Russell JC, Walsh SJ, Mattie AS, Lynch JT. Bile duct injuries, 1989–1993. A statewide experience. Connecticut Laparoscopic Cholecystectomy Registry. *Arch Surg*. 1996; 131:382–8.
- [14] Asbun HJ, Rossi RL, Lowell JA, Munson JL. Bile duct injury during laparoscopic cholecystectomy: Mechanism of injury, prevention, and management. *World J Surg*. 1993; 17:547–52.
- [15] Iannelli A, Paineau J, Hamy A, Schneck A-S, Schaaf C, Gugenheim J. Primary versus delayed repair for bile duct injuries sustained during cholecystectomy: results of a survey of the Association Francaise de Chirurgie. *HPB : The Official Journal of the International Hepato Pancreato Biliary Association* 2013; 15(8):611-616.doi:10.1111/hpb.12024.
- [16] Bismuth H. Postoperative strictures of the biliary tract. In: Blumgart L (ed). *The Biliary Tract. Clinical Surgery International Series*. Edinburgh, Scotland: Churchill Livingstone; 1983:209–218
- [17] Strasberg SM, Hertl M, Soper NJ, 1995: An analysis of the problem of biliary injury during laparoscopic cholecystectomy. *J Am Coll Surg* 180:101- 125.