

Cystic Duct Stump Leak: A Report of Two Cases

Chandan Chatterjee, Dawood Khan, Utpal De

ABSTRACT

Cystic duct stump leak (CDSL) is a unique complication of laparoscopic cholecystectomy. Any patient with a postoperative picture consistent with a bile leak should undergo endoscopic retrograde cholangio-pancreatography (ERCP). Two cases of CDSL are reported, both females, operated for gallstone disease. In one patient open exploration was done and other was managed non-operatively. Both responded and discharged in stable condition.

Key words Cystic Duct, Bile Leak, Laparoscopic cholecystectomy.

INTRODUCTION:

The legacy of biliary fistula has overshadowed biliary surgery since its inception. While iatrogenic injury to the biliary tree received major documentation, the advent of laparoscopic cholecystectomy (LC) has added newer dimension to the existing complication in the form of less focused cystic duct stump leak.¹ Though a rare complication, untreated CDSL can lead to morbidity and mortality. This article illustrates two interesting cases of CDSL emphasizing its importance.

CASE REPORT:

Case-1

Thirty-two year old female underwent standard four port LC without drain for symptomatic cholelithiasis. Cystic duct (CD) and artery (CA) were ligated with ligaclips. On the second post-operative day she developed jaundice, vomiting and high grade fever with chills and rigors. Her urine color was normal and yellow colored stool passed. Abdominal distension and respiratory distress were also noted. Hematological examination revealed neutrophilic leucocytosis (16,000/ cmm), raised blood urea (64 mg/dl), conjugated hyperbilirubinemia (4.3 mg/dl) with normal hepatic enzymes and alkaline phosphatase (103 IU/l). Hepatitis viral markers were within normal limits. Abdominal sonography (USG) revealed post cholecystectomy status (PCS), moderate biloma with normal intra and extra hepatic biliary system. Bilateral pleural effusion was evident

on chest roentgenogram. A drain was placed under local anesthesia through the epigastric port which drained bilious fluid. As the condition of the patient deteriorated, she was referred to our hospital after two weeks.

On admission the patient was dehydrated and pallor was present with generalized edema. She was hypotensive (BP-100/60 mm Hg) with tachycardia (110/min) and tachypnea (30/ min). Abdomen was moderately distended with generalized guarding and absent bowel sounds. She was put on resuscitative treatment with intra venous fluids, NG tube aspiration and antibiotics. Bilious aspirate was noted in the NG tube. Hematological examination revealed anemia (7 mg%), neutrophilic leucocytosis (14,000/ cmm), raised blood urea (45 mg/dl), serum creatinine (2 mg/dl) and conjugated hyperbilirubinemia (5 mg/dl) with normal liver enzymes. Albumin level was 2.0 mg/dl. Magnetic resonance cholangiopancreatography (MRCP) was performed which revealed huge biloma with leakage of bile through the cystic duct (Fig-1). Rest of the hepato-biliary tree was normal. She received two units of packed cells and parenteral nutrition. After adequate optimization the patient was taken up for exploratory laparotomy. On exploration, four litres of infected bile was evacuated, no active biliary leak was noted. Extra hepatic biliary tree was found to be intact and cystic duct stump was found clipless but without any leak. No further attempt was made to visualize the cystic duct and common bile duct junction. After thorough peritoneal lavage, abdomen was closed in layers with a wide bore tube drain. Post-operative recovery was uneventful. The patient recovered satisfactorily and was on oral diet on the third post operative day. Drain was removed on the fifth postoperative day. Patient was discharged on the tenth post-operative day after stitch removal.

Correspondence:

Dr. Utpal De
Department Of Surgery
Medical College and Hospital,
88 College Street, Kolkata, India. 700073
E mail: utpalde@vsnl.net

Patient is doing well and repeat USG and liver functions (LFTs) are within normal limits at six months follow-up.

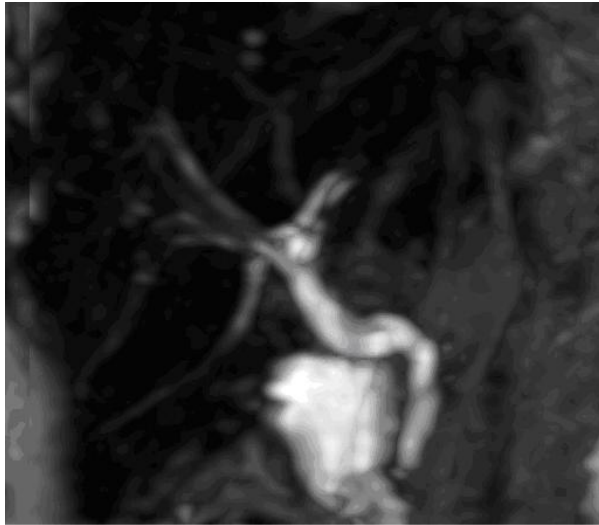


Fig-1. Magnetic resonance cholangio-pancreatography showing leakage (arrow) of bile through the cystic duct.

Case-2

Forty year old female patient underwent LC for symptomatic cholelithiasis. Her preoperative investigations were within normal limits. USG revealed multiple gall bladder (GB) calculi with normal wall thickness and a 3 mm lumen free common duct (CBD). At operation an adhesion free Calot's with clear anatomy was found. CD and CA were doubly clipped and divided. GB was dissected, extracted and tube drain placed in the Morrison's pouch. Postoperative period was uneventful except that the patient started draining frank bile from the second post-operative day.

Physical examination was within normal limits with no evidence of sepsis and jaundice. The average drainage was 200 ml per day. Hematological examination (Hb-12 mg%, TLC- 6500/cmm) including LFT (bilirubin- 0.8 mg/dl, ALT-48 IU/L, AST- 51 IU/L, ALP- 109 IU/L, Albumin- 3.9 mg%) were within normal limits. Patient was put on oral feed which was well tolerated. Patient also passed normal colored stool. USG performed on the fourth post-operative day was normal PCS without evidence of any collection.

MRCP performed on the fifth post-operative day revealed a normal biliary anatomy without any evidence of collection. Leakage of bile was evident from the CD stump. An endoscopic retrograde cholangio-pancreatography (ERCP) was advised which the patient could not afford due to financial constrains (ERCP facility is not available in our

hospital). The biliary discharge started reducing after sixth post-operative day and ceased by ninth post-operative day. A repeat hematology including LFTs and USG was advised which were within normal limits. Stitches were removed and the patient was discharged on the tenth post-operative day. At two years follow-up patient is doing well with normal USG and hematological investigations.

DISCUSSION:

Since 1987, LC has replaced open cholecystectomy as the standard care for symptomatic cholelithiasis.² The worldwide incidence of cholelithiasis in general population is estimated at 10% to 15% of which 1% to 4% require colecystectomy.³ The overall incidence of bile leak in the open cholecystectomy (OC) era was 0 to 0.4% with an increment to 0.4% to 0.6% in the LC era.^{3, 4} CDSL rarely reported after OC constituted a significant complication after LC with an incidence of 0.1% to 0.2% (average – 0.12%)³⁻⁵

The reported etiological factors for CDSL include displacement of surgical clip, improper firing due to defective instrumentation, abnormal CD morphology, necrosis of CD stump resulting from clip coupling phenomenon, due to excessive diathermy, ischemic necrosis resulting from excessive devascularization of CD and raised intracholedochal pressure due to retained stone, ampullary stenosis and spasm.⁶

Presentation include bilious output with either symptoms of pain right upper abdomen, vomiting and fever or asymptomatic, after the second post-operative day. Though controversy exists regarding routine drainage after LC, drainage is beneficial in the setting of aberrant duct morphology, challenging dissection, critical illness and poor intra-operative visualization, all of which are prone to CDSL.⁷

The initial imaging modality is USG. Early sonography may be misleading with minimal findings. Though being cheap, easily available and non-invasive, pinpoint localization of leak is difficult.⁸ The gold standard investigation for CDSL is ERCP. MRCP is 95 % sensitive and 100% specific in CDSL.

The principle behind management of CDSL is to create a low resistance pathway for drainage of biliary system. The treatment options include ERCP with i) sphincterotomy (EST); ii) sphincterotomy with stenting and iii) endoscopic nasobiliary stent placement. Re-exploration is indicated when the above measures fail. Asymptomatic CDSL patients who are stable are managed by watchful waiting where spontaneous closure is expected with-in six to eight weeks.⁹

REFERENCES:

1. Wise Unger S, Glick GL, Landeros M. Cystic duct leak after laparoscopic cholecystectomy: a multi-institutional study. *Surg Endosc.* 1996;10:1189-93.
2. Misra M, Schiff J, Rendon G, Rothschild J, Schwaitzberg S. Laparoscopic cholecystectomy after the learning curve: what should we expect. *Surg Endosc.* 2005;19:1266-71.
3. Orlando R, Russell JC, Lynch J, Mattie A. Laparoscopic cholecystectomy. A statewide experience. The Connecticut Laparoscopic Cholecystectomy Registry. *Arch Surg.* 1993;128:494-8.
4. Savassi-Rocha PR, Almeida SR, Sanches MD, Andrade MA, Frerreira JT, Diniz MT, et al. Iatrogenic bile duct injuries. *Surg Endosc.* 2003;17:1356-61.
5. Dolan JP, Diggs BS, Sheppard BC, Hunter JG. Ten-year trend in the national volume of bile duct injuries requiring operative repair. *Surg Endosc.* 2005;19:967-73.
6. Lien HH, Huang CS, Shi MY, Chen DF, Wang NY, Tai FC et al. Management of bile leakage after laparoscopic cholecystectomy based on etiological classification. *Surg Today.* 2004;34:326-30.
7. Rohatgi A, Widdison AL. An audit of cystic duct closure in laparoscopic cholecystectomies. *Surg Endosc.* 2006;20:875-7.
8. Fujii T, Maguchi H, Obara T, Tanno S, Itoh A, Shudo R, et al. Efficacy of endoscopic diagnosis and treatment for postoperative b i l i a r y l e a k . *Hepatogastroenterology.* 1998;45:656-61.
9. Himal HS. The role of ERCP in laparoscopic cholecystectomy-related cystic duct stump leaks. *Surg Endosc.* 1996;10:653-5.