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Case Report

Spontaneous non-traumatic common bile duct perforation presented as an acute abdomen: a rare case report

Sneha Angadi[1], Vinod Biradar[2]*

Department of General Surgery, S. N. M. C. and H. S. K. Hospital and Research Center, Navanagar, Bagalkot, Karnataka, India

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***Correspondence:**
Dr. Vinod Biradar,
E-mail: winod24@gmail.com

ABSTRACT

The spontaneous perforation of the biliary tract (SPBT) is an extremely rare cause of peritonitis, which was first described by Freeland in 1882, to date only around 70 cases have been reported. Here we present a case of spontaneous perforation of the biliary tract, in a patient with choledocholithiasis. A 45 years old male presented to us with acute abdomen with raised amylase and lipase s/o pancreatitis, imaging showed acute on chronic pancreatitis with impacted distal lumen *in situ* common bile duct (CBD) calculi. Patient was planned for ERCP with CBD clearance after his acute episode subsides. Meanwhile patient developed rigidity, guarding and distension. His second CECT showed a breach in the lower lateral segment in the CBD with gross ascites. Patient was planned for laparotomy, abdominal lavage and T-tube drainage. Patient had a stormy postoperative course. Patient recovered well and was discharged with T-tube clamped and subhepatic drain *in situ*. Spontaneous perforation of the extrahepatic bile duct is a rare but important presentation of gall stones. Conservative surgery that is decompression of the biliary tree and repair of the leak site over T-tube is the mainstay of treatment in the acute presentation.

Keywords: Bile duct, Common bile duct, Peritonitis, Perforation, T-tube

INTRODUCTION

One of the most common reasons for visits to the emergency room is abdominal pain, comprising 7-8% of all visits. Typical presentation of the patient admitted in the emergency department includes abdominal pain and a systemic inflammatory response, including fever, tachycardia, and tachypnoea, abdominal rigidity suggests the presence of peritonitis. The most common causes of peritonitis are appendicitis, cholecystitis, postoperative complications, and colonic non-diverticular perforation, among these biliary tract perforations is an extremely rare cause of peritonitis. The disease rare in adults but more common in infants due to associated congenital anomalies such as choledochal cysts. Few cases have been reported and published since 1882, first case was clinically described by Freeland in1882.[1-4,7], as of 2004 to date only around 70 cases have been reported in English literature with few more additions, a total of 97 cases in past 135 years have been reported.[1] Perforation of the biliary tract is a disease in which wall of the intrahepatic or extrahepatic duct is perforated non-traumatically or due to iatrogenic injury. Non-traumatic perforation of the bile duct in adults is rare, and the management of this condition should resolve the primary pathologic lesion. Probable Mechanisms leading to spontaneous CBD perforation are: increased pressure in the CBD or sudden increase in gall bladder pressure, which is transmitted to the CBD, especially if the CBD is short, compression on the CBD wall (impacted calculi), ischemic necrosis of the wall, due to thrombosis of the supplying vessels. It has also been described as spontaneous perforation of the bile duct.[5] Here we present a case of perforation of the biliary

tract, in a patient with impacted CBD Calculi. Perforation of the common bile duct was most probably related to the abrupt increase in local intraluminal pressure causing erosion by the stones. This results in abrupt increase in intraluminal pressure and decreased blood flow in the vessels which run along the lateral border of the bile ducts, resulting in ischemia on the anterior surface of the bile duct.

CASE REPORT

45 years male presented to us with compliant of pain abdomen for 5 days and fever for 5 days, he was apparently alright 5 days back when he developed pain abdomen sudden onset progressive in nature, intermittent type, radiating to back, which was associated with vomiting 4 to 5 episodes non-blood tinged, nonbilious. C/o fever for 4 days, associated with chills and rigour. On examination- patient was conscious, cooperative and well oriented with thin built and moderately nourished, BMI-19 and was tachycardic. Per abdomen examination revealed tenderness over epigastrium. On CECT, patient was found to have impacted CBD calculi with acute on chronic pancreatitis. The patient was planned for ERCP due to continued organ dysfunction and cholangitis. In interim, the patient developed guarding and rigidity with features suggestive of septic shock.

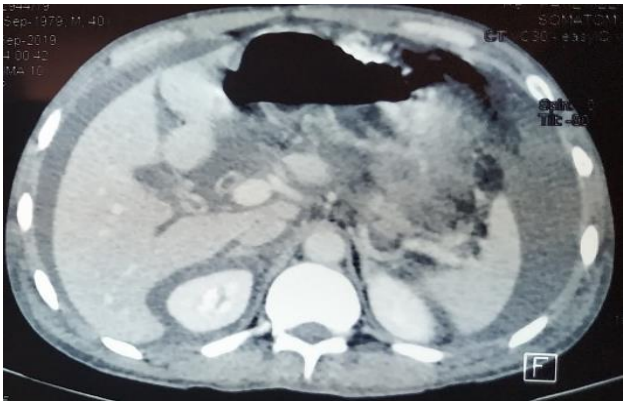

Figure 1: Pre-operative CECT impacted CBD calculi.

Figure 2: Disruption of right lateral wall in supra-pancreatic segment of CBD.

Repeat CECT abdomen and pelvis was done which showed focal discontinuity/disruption of right lateral wall in supra-pancreatic segment of CBD with periductal collection. Suggestive of spontaneous CBD peritonitis and acute on chronic calcific atrophic pancreatitis, gross ascites with right moderate and left mild pleural effusion with collapse consolidation of the underlying basal segment.

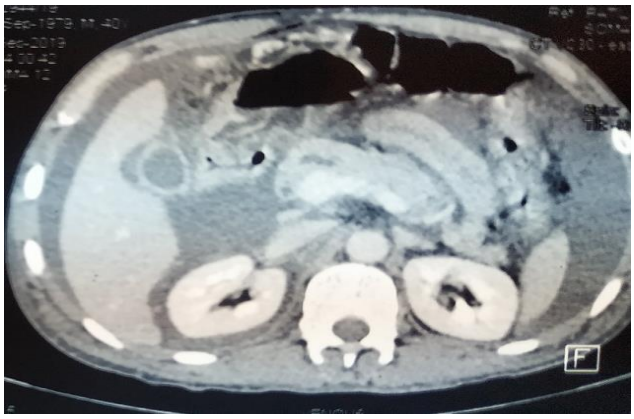

Figure 3: Acute on chronic calcific atrophic pancreatitis, ascites with pleural effusion.

Intra-operative findings

Then patient underwent emergency laparotomy under general anaesthesia with epidural catheter. A large CBD perforation was identified around 2*1 centimetres at the lateral border of the CBD with about approximately 2.5 litters of bile in peritoneal cavity. Peritoneal lavage was given and 14 F T-tube placed in the CBD as a damage control procedure with sub hepatic and pelvic drainages.

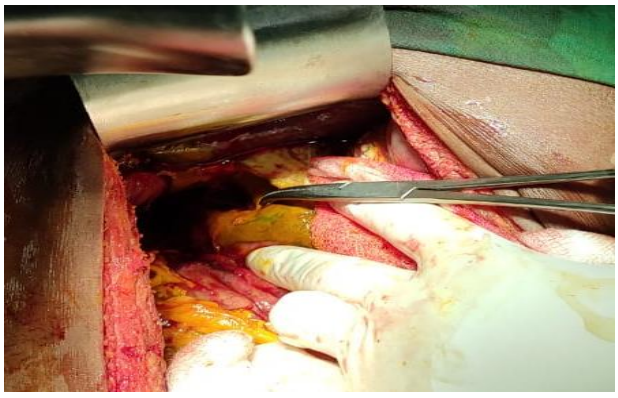

Figure 4: Intra-operative picture showing CBD perforation.

Post-operative course

He had a stormy post-operative course with ventilatory and nor-adrenaline support for 2 to 3 days. He was extubated on pod 3rd. Post-operative day 5, T-tube cholangiogram was done which showed irregular walls of CBD with leakage, contrast in GB fossa and drainage

tube with contrast flowing into the duodenum. The patient developed septic shock on post op day 12 requiring pressure supports and antibiotics (imipenem). Post-operative day 25 repeat CECT was done showed post op status with surgical drain in the GB fossa and T-Tube in situ CBD, no evidence of collection with chronic calcific atrophic pancreatitis. He was discharged with the sub hepatic drain *in situ* with clamped T-tube. The patient underwent ERCP and Stenting on day 35 due to persistent discharge from sub hepatic drain. Now the patient is mobile on normal diet on regular follow up with no stent or drain *in situ*.

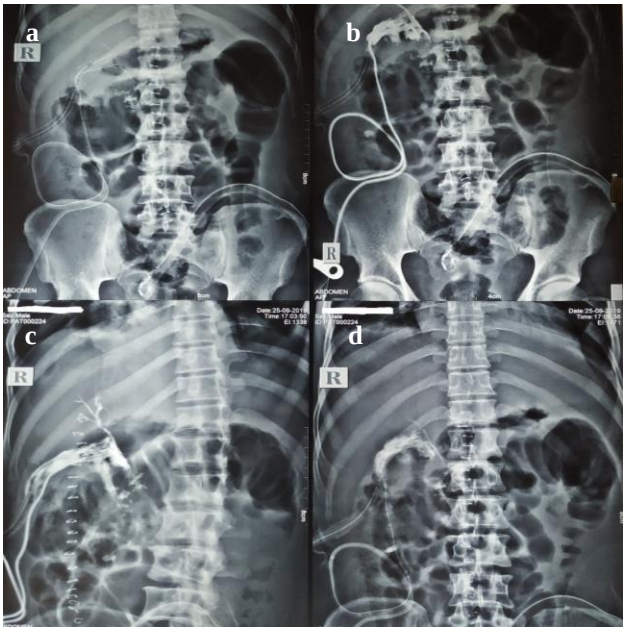

Figure 5 (a-d): Post-operative T-tube cholangiogram.

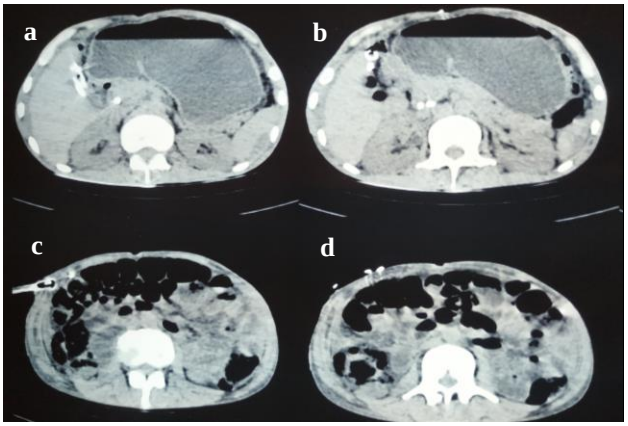

Figure 6 (a-d): Post-operative CECT showed sub-hepatic drain *in situ*.

DISCUSSION

In 70% of reported cases, ductal stones are associated with the perforation. Kang et al quoted the most common site of extra-hepatic bile duct perforation (excluding the gallbladder which complicates up to 10% cases of acute cholecystitis is the CBD (42 patients) followed by the common hepatic duct (28 patients).[7] When the perforation is described in the CBD, it is usually over the anterolateral surface of the supra duodenal portion of the CBD distal to the confluence of the cystic duct and the common hepatic duct. Others are weakness of the wall of the bile duct may be due to congenital weakness, choledochal cyst, ischemia of bile duct, pancreatic reflux, pancreatitis, birth trauma, torsion of gall bladder, presence of diverticulum, tuberculosis of CBD, abnormal glands of the bile duct wall, necrotizing enterocolitis or viral infection of the bile duct. Congenital stenosis of ampulla of vater, congenital malformation of pancreaticobiliary junction, choledocholithiasis, inspissated bile, biliary sludge, protein plugs, obstruction of CBD by tumour, parasites or spasm of sphincter of Oddi may lead to raised canalicular pressure and cause perforation.[2] One of the mainstays in the treatment of choledocholithiasis is the ERCP with endoscopic sphincterotomy.[3] Perforation is also found following biliary surgery and interventions. The most frequent cause of bile duct injury is iatrogenic, it sometimes occurs after invasive procedures such as ERCP and sphincterotomy.[5] Clinically it may present as nonspecific abdominal pain to biliary peritonitis to forming biomass. Universal management involves decompression of the biliary tree with repair of the leak site.

Recommended treatment in such cases is CBD stenting through ERCP if perforation is small and discovered early. In diagnosis-delayed cases or large perforations with gross ascites in sepsis laparotomy with cholecystectomy and CBD closure over T-tube is treatment of choice.[4] In most cases, the encapsulation of the bile within the omentum and mesentery prevents generalized peritonitis, forming biomass; which are generally localized in the right upper quadrant of the abdomen. As the bile is sterile and is absorbed by the peritoneum, the patients may not present symptoms for weeks, until the bile becomes superinfected, thus the diagnosis is delayed by weeks. In such cases ERCP and percutaneous drainage may be required.

CONCLUSION

Nontraumatic perforation of the bile duct should be suspected when perihepatic abscess or peritonitis is combined with biliary stone disease. The management of nontraumatic perforation of the bile duct should include the eradication of the primary pathologic lesion and the control of abscess or peritonitis. Spontaneous perforation of the extrahepatic bile duct is a rare but important presentation of gall stones but important condition in adults. Despite advances in intensive care management, delayed treatment still results in high morbidity and mortality Therefore, awareness of the clinical presentation and expert ultrasound examination are important adjuncts in the diagnosis. Conservative surgery is the mainstay of treatment in the acute presentation.

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