Rupture of the Common Bile Duct; 
A Rare Cause of Biliary Peritonitis

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Abstract
A 17-year-old unmarried female complained some pain in the right iliac fossa with associated 
nausea, vomiting and anorexia. Her examination revealed a conscious and febrile(38° C) 
patient with tenderness in right half. The laboratory findings showed leukocytosis at the time 
of admission. The patient was admitted to the surgical ward with provisional diagnosis of 
acute appendicitis. Laparoscopic appendicectomy was planned for the patient on the same 
day. When we introduced the camera, a sufficient amount of bile was noted in the peritoneal 
cavity. All other organs including appendix were examined and were found to be normal. 
Consequently, a diagnosis of perforation in the hepatobiliary system was made and the 
procedure was converted to open through a mid line laparotomy incision. Gall bladder was 
collapsed and there was 0.5 cm irregular perforation in the common bile duct. Per operative 
cholangiogram was unremarkable. A T tube was inserted and peritoneal cavity was washed 
with normal saline. A drain was placed down to the common bile duct and abdomen closed. 
The patient made uneventful recovery and was discharged home in a stable condition. 
Spontaneous Common Bile Duct Injury is extremely rare which should be considered by all 
physicians dealing with the patients with acute abdomen.

Key words: Biliary peritonitis, Common bile duct perforation, Right iliac fossa pain

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Introduction
Spontaneous rupture of Common Bile Duct (CBD) unrelated to calculi, surgery 
or trauma is exceedingly rare1-7. The cause is idiopathic once these causes and 
choledochal cyst are ruled out. It was first 
described by Caulfield in 19368. After that, 
very few cases have been reported in the 
literature. The condition may present 
acutely without previous signs of biliary 
tract disease.
The condition presents a diagnostic 
dilemma. Preoperative recognition is
necessary as early surgical intervention gives excellent prognosis. The authors want to report clinical observations made in such a case with acute presentation.

Case Report

The patient is a 17-year-old unmarried female who was admitted to the hospital through ER with a one day history of pain right iliac fossa which was associated with nausea, vomiting and anorexia. She was a non-smoker and medically free with no history of trauma or any drug intake. On the examination, the patient was fully conscious and febrile (38° C). There was tenderness in right half of the abdomen. The laboratory findings at the time of admission were: WBC 15.3 (4-10), HGB 14.1 g/dL(12-15), HCT 44% (36-46), PLT 502 (150-400), ALT 169.36 U/L(0-31), AST 37.13 U/L(0-31), ALP 89.3 U/L, Total Bilirubin 5.5 umol/L(0-17), Amylase 53.98 IU/L(28-100). Urea, Creatinine and electrolytes were within normal range.

The patient was admitted to surgical ward with provisional diagnosis of acute appendicitis. Laparoscopic appendicectomy was planned for the patient on the same day. When we introduced the camera, a sufficient amount of bile was noted in the peritoneal cavity. All other organs including appendix were examined and were found to be normal. So the diagnosis of perforation in the hepatobiliary system was made and the procedure was converted to open. Mid line laparotomy was done. Gall bladder was collapsed and there was 0.5 cm ragged perforation in the common bile duct. No masses were palpable in the duodenum or common bile duct. Per operative cholangiogram was performed to rule out any other pathology. T tube was inserted and peritoneal cavity was washed with normal saline thoroughly. A drain was placed down to the common bile duct and abdomen closed (Figure 1).

Figure 1: Area of perforation in anterior wall of CBD

Post operative recovery of the patient was uneventful and her condition improved quickly. Post operative HGB was 10.2 and WBC reduced to 8.69. Liver enzymes returned to normal gradually. T tube cholangiogram was performed on the 9th post operation day and revealed free flow of contrast through the biliary tree, intra and extra hepatic bile ducts down into the duodenum and proximal loops of jejunum with no leak of contrast. She was discharged home on the 16th post operative day with a follow up plan in OPD after one week.

Discussion

Spontaneous rupture of common bile duct is very rare condition and its occurrence has been attributed to a number of factors. Most of the reported cases were associated with the presence of stones. Sometimes there may be other factors like, intra mural infection, presence of diverticulum in the common bile duct, necrosis of the wall of the common bile duct secondary to thrombosis of intramural vessels or increased intraductal pressure secondary to obstruction at the sphincter of Oddi9-12.

A combination of factors is probably responsible for the rupture of CBD. Erosion of a calculus through the wall of the duct is usually a slow process and is mainly associated with fistula formation. Further complete distal obstruction by these stone results in an elevation of intraductal...
pressure. In most cases this will be presented as obstructive jaundice. However, if the wall of the bile duct has been weakened, the raised pressure may precipitate a rupture. Infection plays an important role in the etiology of spontaneous rupture, combined with presence of calculi and/or diverticulum which are probably the important factor in causing weakness of the wall of the duct. Thrombosis of the intramural vessels probably follows an infection. A retroperitoneal location of biliary collection or a chronic biloma is a rarely reported complication of CBD perforation. The potential space of retro peritoneum can be divided into anterior and posterior compartments. The esophagus, duodenum, pancreas, lower two third of CBD, portal and splenic veins, appendix, ascending and descending colon and the recto sigmoid junction are part of anterior compartment; while kidney, ureter, lymph nodes, great vessels and gonadal vessels are included in the posterior compartment. Perforation of the upper one third of CBD, especially at the junction of CBD with cystic duct (a site of congenital weakness) results in a lesser sac collection since the gall bladder, cystic duct, and upper one third of CBD are intraperitoneal. Perforation of lower CBD results in a retroperitoneal collection since the lower two thirds of CBD lies in the anterior compartment of retroperitoneum. The condition remains a diagnostic dilemma in the absence of appropriate imaging studies, which may result in delayed surgical intervention and poor prognosis. Early surgical management is required to treat CBD perforations and biliary collections. The choice between simple peritoneal drainage and T-tube drainage is a matter of discussion. In cases where the pre operation or per operation diagnosis of the site of perforation is indeterminate, external drainage is appropriate. If there is any evidence of distal CBD obstruction or if one is not able to obtain a per-operative cholangiogram, then the condition is best managed by a T-tube drainage and peritoneal lavage. The patient requires postoperative antibiotics to counteract cholangitis and septicemia.

Conclusion

The perforation of CBD is a very rare condition and early diagnosis is the key to a successful management of the patient. It may result in features of peritonitis or retroperitoneal collections which may track further away from the site of perforation. It is important to recognize this association.

References