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Case Report

A Rare Case of Biliary Peritonitis Due to Rupture of Common Bile Duct as a Result of Blunt Trauma Abdomen.

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Key words
Biliary peritonitis,
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Common bile duct,
Road traffic accident.

Abstract

Background: Injury to the common bile duct and gall bladder due to blunt abdominal trauma is not usually reported. Usually, common injuries to the liver, spleen, bowel, and mesentery were reported due to blunt abdominal trauma in road traffic accidents. Routinely Physician focuses on such types of injuries and misses the injuries to unusual internal organs like common bile duct and gall bladder. We report a rare case of biliary peritonitis due to blunt abdominal trauma in case of a road traffic accident where there was unusual involvement of common bile duct.

Case Report: A 37-year-old man commuting in a bullock cart hit by a lorry and sustained minor abrasions on the back. He was taken to a nearby hospital and referred to our hospital after 18 hours of the incident. However, patient was expired during treatment within 36 hours of admission. The autopsy revealed bile stained fluid in the peritoneum and injury to the common bile duct near the pancreatico-duodenal junction. Histopathology of the gall bladder revealed the chronic inflammatory changes.

Conclusion: Isolated traumatic rupture of the common bile duct due to blunt abdominal trauma without injuries to surrounding organs is very rare. Meticulous autopsy helps to detect such type of internal injuries and to study the mechanism of injury causing the death following trivial trauma.

Background

Trauma to the abdomen could be either open or closed. However, the damage following trauma depends upon the type of force, the site of impact, and the resistance offered by the abdominal wall. It also varies depending on the consistency, mobility, state of distension of organs. Following trauma, the rupture of solid organs such as the liver and spleen occurs more frequently than hollow organs like the stomach and intestines. Intra-abdominal injury following blunt trauma is common but gall bladder injury after blunt trauma is not common. Solitary injury to the extrahepatic common bile duct following non-penetrating blunt abdominal trauma is extremely unusual. But it may occur iatrogenically as a complication of cholecystectomy or during gastrectomy, pancreatectomy, or endoscopic retrograde cholangiopancreatography (ERCP).[1]

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Incidence of cholecystectomy-associated bile duct injury between 0.1% to 0.3% for open cholecystectomy and 0.3% to 0.6% for the laparoscopic approach.[2,3] Biliary peritonitis following blunt abdominal trauma is extremely unusual. The mortality rate of biliary peritonitis is 50-75%.[4] Most common cause of biliary peritonitis following blunt abdominal trauma is gall bladder injury while the extrahepatic biliary injury is a rare entity.

The most commonly injured organs being the gall bladder while the extrahepatic biliary injury is a rare entity. The surrounding liver, kidney, duodenum, costal arch along with vertebral bodies provide bony and visceral cushion to the extrahepatic biliary duct. Due to their infrequent occurrence of non-iatrogenic extrahepatic biliary tract injuries, there is an inadequate index of suspicion and patient evaluation for these injuries. [1] Incidence of bile leak following extrahepatic biliary trauma is reported as 0.5-2.1%.[5] Mortality among these is extremely unusual due to failure to suspect the possibility of such injury and immediate exploratory laparotomy resulting in a fatality.

Usually, biliary injuries are reported due to iatrogenic causes and are repaired successfully. The complexity of bile leaks after blunt abdominal trauma is more, unlike iatrogenic bile duct injuries. However, biliary injuries due to non-iatrogenic causes such as penetrating trauma due to stab injury, gunshots, and non-penetrating blunt trauma abdomen due to a road traffic accident, blows, or kicks, fall from height.[6] Injury to biliary tract following blunt trauma abdomen can be extrahepatic or intrahepatic. We report an unusual case of biliary peritonitis due to traumatic rupture of common bile duct following a road traffic accident with trivial external injuries.

2. Case report:

Thirty-seven-year-old male presented to the hospital with complaints of discomfort and pain left side of neck, left upper limb, numbness of lower limbs for 2 days. Perusal hospital records revealed a history of travelling as a passenger in a bullock-cart and the bullock-cart was struck from behind by a lorry and thrown out of the cart. However, he sustained minor abrasions on the upper back. After two days, he went to a nearby hospital complaining of pain in the neck, numbness, and weakness of the limbs. CT-C Spine revealed fracture of C4 vertebra and he was diagnosed with traumatic quadriparesis, referred to a higher institute for treatment on Day 3 and died within 36 hours after admission on day 5.

On autopsy, he was moderately built, stature (164cm), weight (60 Kg), teeth (16/16), and rigor mortis were well marked all over the body. Grazed abrasion (brown scab) was present on the back of the left scapular region and back of the left arm. Internal examination revealed bile-stained fluid in the peritoneal cavity (fig.1a) and the viscus on the right side such as the duodenum, hepatic flexure, ascending colon, right kidney was bile-stained (fig.1b) owing to suspicion of the ruptured gall bladder. But the gall bladder remains intact.

Figure 1a: Bile-stained fluid extravasation from peritoneal cavity. Figure 1b: Showing bile-stained hepatic flexure, ascending colon.

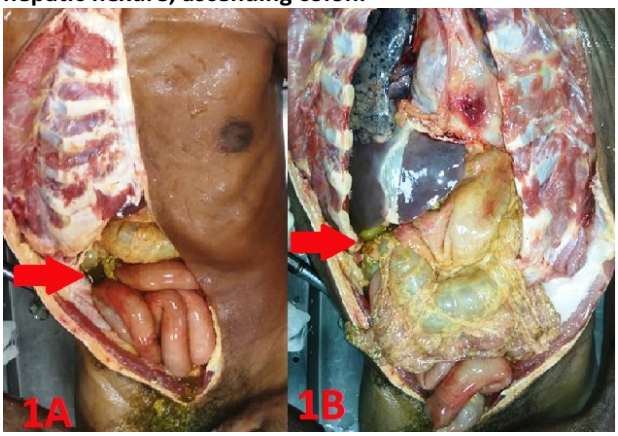
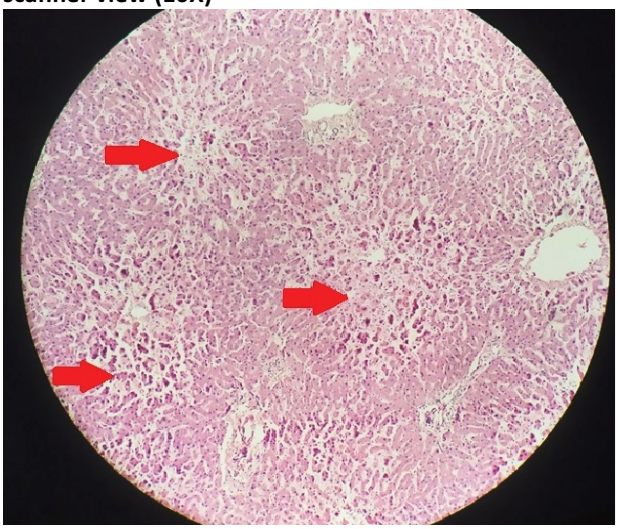


Figure 2: H & E staining of liver showing spotty necrosis scanner view (10X)



On meticulous inspection of the biliary and the extrahepatic biliary tract, we found a 1cm long defect in the common bile duct retro-pancreatically

just before its attachment into the second part of the duodenum. A histopathological examination was done for the site of rupture and bile-stained tissues such as liver, ascending colon, gall bladder. Microscopic sections revealed focal spotty necrosis and degenerative changes of the liver (fig.2); chronic inflammatory changes of the gall bladder (fig.3) and serosal inflammation of the ascending colon (fig.4).

Figure 3: H & E staining of gall bladder showing wall with chronic inflammatory cells (40X)

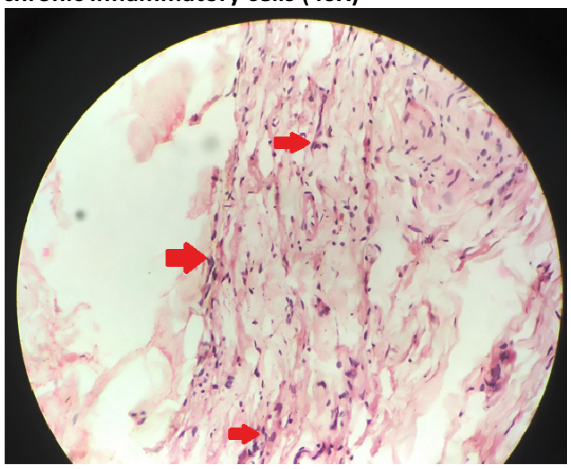
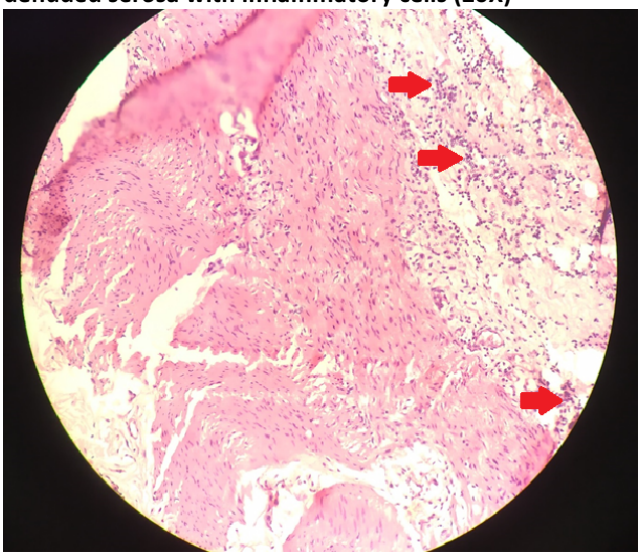


Figure 4: H & E staining of ascending colon showing denuded serosa with inflammatory cells (20X)



The pathological diagnosis was a traumatic rupture of common bile duct. The opinion as to cause of death was biliary peritonitis due to the rupture of common bile duct as a result of blunt trauma abdomen.

3. Discussion:

Intra-abdominal injuries following blunt trauma abdomen are more common owing to the high incidence of road traffic accidents. The more frequently involved abdominal organs in blunt trauma abdomen are liver, spleen, kidneys when compared to the gall bladder, and extrahepatic bile duct. They are well-guarded beneath the costal margin. Injury to the gall bladder or common bile duct after non-penetrating blunt trauma is less reported. Solheim reported only 3 cases of injured gall bladder out of 291 cases of closed abdominal injury encountered during the twenty years.[7] Traumatic extrahepatic biliary tract injuries represent less than 1 percent of all traumatic injuries.[1] Smith et al. collected twenty-six cases of rupture of the extrahepatic biliary tract in the literature review and added his case report. [8] According to Burchardt, the actual site of perforation cannot be demonstrated as a minute perforation permitted the escape of bile under tension. [9]

Bile duct injuries may be classified by mechanism and type of injury, location of the injury, the effect on biliary continuity, and timing of identification. Concomitant rupture of multiple organs occurs due to anatomical proximity, the sudden force causing compression, sudden flexion of the trunk putting undue strain on the underlying viscera. Traumatic injuries include partial or complete extrahepatic duct transection or duct avulsion, occasionally in near the pancreas.[10] Overall incidence of bile duct injuries in blunt abdominal trauma cases is 3-5%. Out of which 85% are due to penetrating trauma and 15% due to non-penetrating trauma. Among the 15% of non-penetrating gall bladder trauma, 85% have a solitary involvement of gall bladder. In our case, there was a solitary injury to the extrahepatic biliary tract following blunt abdominal trauma without the involvement of adjacent visceral organs. Rupture of the extrahepatic biliary tract following abdominal trauma is unusual. Injury to a biliary tract following trauma can be either extrahepatic or intrahepatic. Extra-hepatic bile duct injury may occur solitarily without the involvement of liver while intra-hepatic bile duct injury is invariably associated with the liver injury.[11] The liver is the most concomitantly injured organ in more than 50% of the cases.[5,7] However, in our case there was no associated liver injury. Wainwright reported the first case of common bile duct injury in 1799. [4] Bourque et al- reported 125

cases since 1806, of which 1/3rd was pediatric group. Dawson et al- reported one case of common bile duct injury out of 10,500 consecutive trauma patients.[12]

Biliary peritonitis carries a mortality rate of 50-75%. The most common cause of non-iatrogenic and non-penetrating traumatic biliary peritonitis is gall bladder injury while extra-hepatic bile duct injury is reported in a few cases.[13,14] Common sites of injury of the common bile duct are usually at the areas of relative fixation of biliary tract i.e., a) origin of left hepatic duct b) bifurcation of hepatic ducts and c) pancreaticoduodenal junction. In the present case, there was localized injury to the common duct at the pancreaticoduodenal junction triggered by the trivial trauma due to blunt force leading to the combination of two mechanisms discussed here. There was an eventual transection of the intrapancreatic bile duct due to the shearing forces on the common bile duct at its fixed point at the edge of its entrance to the pancreas.[12] Mechanism of injury to common bile duct is well explained as horizontal deceleration trauma due to compression of a ductal system against the vertebral column and shearing force causing avulsion of common bile duct at its fixed part or due to sudden rise in intra-luminal pressure of gall bladder owing to the short and permeable cystic duct.[13] In our case, there was horizontal deceleration force and shearing force was acting on the ductal system and the pre-existing chronic inflammatory condition of the gall bladder. This resulted in the perforation of the common bile duct. "Biliary Dew" has been the term coined by Leriche in 1923 for such cases where a minute perforation occurs in the retro-pancreatic portion of the common bile duct from where the extravasated bile leaks into the peritoneal cavity. [11] In our case biliary dew was seen without any blood due to solitary injury to the common bile duct.

Smith and Sherlock emphasized the difficulty of early diagnosis of rupture of the extrahepatic biliary system until 36 hours or more after the accident unless the bile is infected enough to cause symptoms and signs of severe peritonitis.[15] In this case, there was a delay in the recognition of biliary leakage clinically and biliary peritonitis was detected due to meticulous dissection during the time of autopsy. Although localized bile may be tolerated in the peritoneal cavity, generalized choleperitonitis becomes fatal in a short period.[16] Bile in the peritoneal cavity induces toxic manifestations by the irritable nature of the bile acids and bile salts which produce decreased circulatory volume ensuing shock. This case emphasizes the occurrence of trivial trauma to the pre-existing and silent chronic conditions exacerbate the injury to the extrahepatic areas of common bile duct solitarily.

4. Conclusion:

In our case, the site of rupture of the common bile duct is the retro-pancreatic and combined effect of horizontal deceleration trauma leading to rupture which is highly unusual and unexpected causing fatal peritonitis. The meticulous autopsy revealed an undetermined rupture of the common bile duct in the region of its attachment to second part of duodenum retro-pancreatically. This case highlights the importance of autopsy in understanding the mechanism, site, and severity of injury although there are negligible external injuries. Late recognition and delay in diagnosis due to lack of awareness of the mechanism of injury might lead to mortality. Histopathological findings played an important role in relating the extent of damage to viscera.

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