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Case Report

Complex stab related injuries involving the diaphragm, bowel and cystic duct: a case report

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ABSTRACT

Penetrating abdominal trauma is a major killer worldwide. Biliary duct injuries resulting from penetrating stab wounds are rare but potentially life-threatening occurrences. This case report outlines a rare case, diagnosis, surgical management, and postoperative outcomes of a patient who sustained a cystic duct injury due to a penetrating stab wound. There is paucity of such cases in the literature. A 55-year-old man sustained a penetrating wound and was found to have cystic duct injury intra-operatively along with other multi-visceral injury. The patient underwent a cholecystectomy with the management of associated injuries. The report aims to highlight the rarity yet the possibility of such injuries and emphasize the importance of a high index of suspicion.

Keywords: Penetrating trauma, Cystic duct injury, Extrahepatic bile duct injury, Stab

INTRODUCTION

Cystic duct injuries are relatively uncommon and often occur in the context of cholecystectomy or blunt abdominal trauma.[1,2] Penetrating stab injuries leading to cystic duct injury are even rarer. Timely diagnosis and appropriate surgical management are essential for a favorable outcome. We present a case of cystic duct injury complicated with bowel and diaphragmatic injury following a penetrating stab injury and discuss the clinical course and management.

CASE REPORT

We report a clinical case of a 55-year-old man who presented to the emergency department with severe abdominal pain after sustaining two stab wounds in the left upper abdomen and left lumbar region. On examination, he had tachycardia, tachypnea and a blood pressure of 80/50 mmHg. On clinical examination, the patient had a stab wound in the left 7th intercostal space in the midclavicular line and another one in the left lumbar region along the anterior axillary line which was breaching the peritoneum and signs of peritonitis were present. Initially, the patient was resuscitated in the casualty.

After hemodynamic stabilisation, radiological investigations including a plain CT abdomen, revealed the presence of free air under the right dome of the diaphragm (Figure 1). Concomitantly, an HRCT thorax indicated a left-sided pneumothorax (Figure 2). These radiological findings further supported the diagnosis of perforation peritonitis.

Surgical management

An emergent exploratory laparotomy was performed. Intra-operatively, the cystic duct was found to be injured just proximal to the gall bladder neck-duct junction (Figure 3) with bile collection in the retroperitoneum (Figure 4) due to penetrating stab injury. This was also associated with a left-sided diaphragmatic rent of size 3×3 cm (Figure 5) and a through and through perforation in the bowel 70cm from the duodenal-jejunal flexure (Figure 6).

An open cholecystectomy was performed to prevent further complications with a fundus first approach: the gall bladder was separated from the liver bed and the cystic duct was clipped and the specimen was delivered out. The jejunal perforation was dealt with resection and anastomoses, done in 2 layers. The diaphragmatic rent was repaired with a polypropylene 1-0 suture. An abdominal drain was placed in the sub-hepatic space and an Intercostal Drainage tube was placed in the left hemithorax.

Post-operative course

Post-operatively, the patient was closely monitored in the intensive care unit. The patient was maintaining vital parameters. Intravenous antibiotics and supportive care were initiated. The abdominal drain was removed once output decreased and the chest tube was removed 5 days after the surgery. The patient developed an intra-abdominal abscess located below the anterior abdominal wall which was drained via the suture site and antibiotics were instituted. Thus, the patient was managed conservatively with no additional intervention. The patient was subsequently discharged.

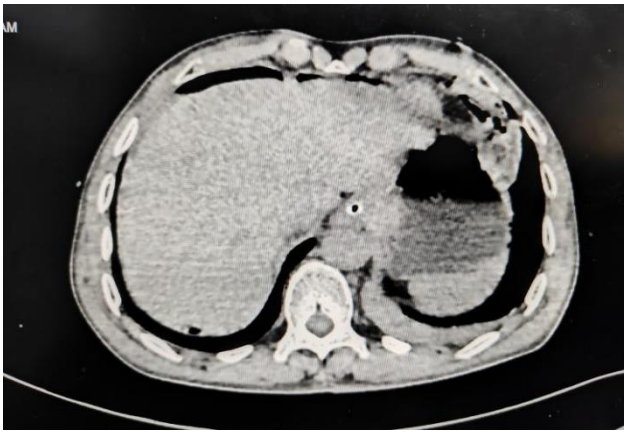

Figure 1: CT Abdomen plain revealing pneumoperitoneum.

Figure 2: HRCT thorax suggestive of left sided mild pneumothorax.

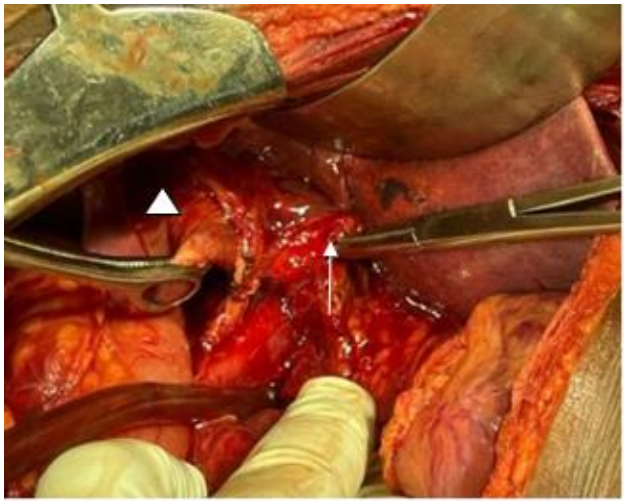

Figure 3: Sponge-holding forceps holding the gall bladder fundus (arrowhead) and curved artery forceps is seen entering the perforated cystic duct (arrow).

Figure 4: Biliary collection is seen in the retroperitoneum (arrowhead).

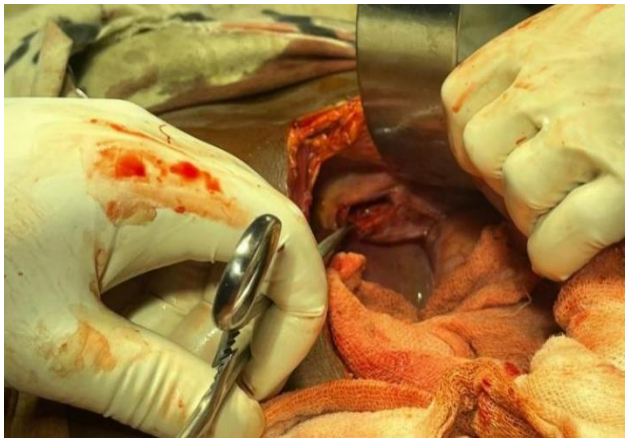

Figure 5: Diaphragmatic rent is pointed out by the artery forceps.

Figure 6: Through and through perforation situated 70 cm from the DJ-flexure.

DISCUSSION

Penetrating injuries to the abdomen are a common occurrence worldwide. There are various modes and mechanisms of injury described. However, the anatomical position of the gallbladder renders it protection from any abdominal trauma; hence, the incidence of gallbladder injury in penetrating or blunt trauma is about 2%.[3] Gall bladder injuries are rarely found in isolation and are mostly accompanied by liver injuries, as well as other abdominal organ injuries.[4,5] In our case report, the injury was associated with bowel and diaphragmatic injury. Penetrating trauma is the main etiological factor. This is in line with a study by Ball et al where they found out that the major reason for gall bladder injury was penetrating trauma in 89% of the cases and associated injuries were almost always present (98%).[2] The incidence of gallbladder injury accompanying other intraabdominal trauma ranges between 0.5 to 8.6%.[6]

A variety of treatment options are available in the management of gallbladder injuries, including following: expectant observation, drainage cholecystostomy, or removal of the gall bladder. Reports from the last two decades indicate that cholecystectomy is viewed as the operation of choice for traumatic injuries to gallbladder.

Our case stands out because of the location of the gall bladder injury. Whilst a series of traumatic gall bladder injuries can be found in the literature, there have been no reports of injury to the cystic duct.

One must remember here that the outcome of patients with gallbladder injuries is synonymous with the mortality induced by their associated injuries.[5,7-9] Not surprisingly, patients with injuries to the gallbladder present in accordance with the severity of their concurrent trauma. The patient in this context presented to us within 24 hours of injury and was managed promptly without any delay. The associated injuries were also dealt judiciously including management of the post-operative complication which resulted in a successful outcome in this case.

CONCLUSION

Cystic duct injuries due to penetrating stab injuries are uncommon but require prompt recognition and surgical intervention. The presence of bile in the retroperitoneum, hepatoduodenal ligament, or abdominal cavity, which in fact can be hidden by the hemoperitoneum, is an indicator of bile duct injury. This case report underscores the importance of a high index of suspicion and surgical expertise in managing such injuries, ultimately leading to a successful patient outcome. Increased awareness of this rare presentation can aid in early diagnosis and improved patient care.

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