

Rupture of Common Bile Duct due to Blunt Trauma

Omar Ali Khan,* M.B., B.S.,
F.R.C.S. ;

Qamar Zaman,** M.B., B.S.,
F.R.C.S.

and

Qazi Khadim Mohyuddin***
M.B., B.S., F.R.C.S.,

Khyber Medical College,
Peshawar, Pakistan

Summary

An isolated partial tear in the common bile duct due to blunt trauma causing huge cystic swelling of the lesser sac, mimicking ascites but without any signs of an intra-abdominal catastrophe, resulting in delayed diagnosis, is described.

Introduction

Blunt trauma causing isolated tear of the common bile duct (C.B.D.) is a rare injury. Its occurrence and successful treatment in a girl aged 8 years is described.

Though she also sustained a fracture of the shaft of right femur, nevertheless in abdomen the only injury detected was a partial tear in the C.B.D. This tear in the C.B.D. communicated freely with the lesser sac and caused a huge cystic swelling mimicking ascites. The pain was negligible. It was more of a discomfort rather than pain and was intermittent. Distension was a constant and presenting feature. Jaundice was significantly absent. The appetite was markedly reduced; there was no nausea or vomiting. The bowels were constipated and there was a good response to enemata. Loose motions following an enema never caused diminution of the distension of abdomen. Throughout the illness, the patient remained afebrile. Vague symptoms and paucity of signs delayed the diagnosis.

The only indication for surgery in this case was progressive gross distension of the abdomen which was confirmed to be biliary ascites by the peritoneal tap.

*Associate Professor of Surgery;

**Assistant Professor of Surgery;

***Professor of Surgery,

Khyber Medical College and Consultant Surgeons, Khyber Hospital.

Battle's report in 1894 of an isolated complete transection of the C.B.D. due to blunt trauma was the earliest report in English literature.¹ He described the case of a six-year-old boy run-over by a hansom cab.² Cotte quoted Drysdale's case of a boy crushed between carriage and a wall.³ A total of 96 cases of injury of C.B.D. have been described. The break-up is as follows:—

- a. 24 cases of complete transections, isolated,
- b. 12 cases of complete transections with other intra-abdominal injuries and
- c. 60 cases of isolated partial injury.

Case Report

H.A., female, aged 8 years was admitted on 4.7.1979 in the Orthopaedic ward, Khyber Hospital, Peshawar with a diagnosis of fracture of right femur caused by trauma sustained due to an accident while riding a cycle, as a result of collision with a station wagon on 13.6.1979.

Soon after the injury, the patient was admitted at a local hospital where the treatment for fracture of right femur was initiated. There was no abdominal complaint at the time of injury.

Three days after the injury, the patient started developing distension of the abdomen with some discomfort but no other abnormality. The patient remained in the local hospital till 3.7.1979 when an X-ray of right femur revealed gross deformity and lack of union in the fractured femur. Failure of attempts to treat the fracture by fixed tissue traction in Thomas splint prompted the attendants to shift the patient to Khyber Hospital, Peshawar, where she was admitted on 4.7.1979.

Till this time, apart from pain in the fractured thigh and progressive distension of the abdomen with associated discomfort which was eclipsed because of the severity of pain in the thigh, no other abnormality was noted.

On clinical examination, some distension of the abdomen was noted but there was no pain. Patient was taking food normally; there was no vomiting or any other post-prandial symptoms. The discomfort of distension was constantly present. There was an irregularity of bowel habit ever-since injury: a period of constipation would respond to an enema in the form of frequent loose motions.

Abdominal examination revealed gross distension of the abdomen with everted umbilicus. Abdomen felt tense and no viscera or mass could be palpated. Slight tenderness on deep palpation was detected and fluid thrill could be elicited. Bowel sounds were present. A probable diagnosis of ascites was made.

Laboratory investigations revealed Hb. 7 G/100 ml; E.S.R. 125 mm/hour; T.L.C. 10700; D.L.C. — Poly. 40%, Lympho. 54%. Urine examination revealed no abnormality. Plain X-ray abdomen did not show any sign of intestinal obstruction or perforation.

During her stay in the Orthopaedic ward over the next two days, the distension of the abdomen increased and became very marked. A call to the general surgical unit was made on 6.7.1979. A tap in the left iliac fossa revealed pure bile. The diagnosis was changed to biliary peritonitis and an operation was performed on 8.7.1979.

OPERATIVE FINDINGS

A right paramedian para-umbilical incision was given under general anaesthesia which was later on extended both up and down. On opening the peritoneum, a greyish looking sac was seen; it was aspirated and collection of bile was confirmed.

One could insinuate one's hand between the sac and parietal peritoneum of the abdominal wall upto the flanks but not beyond. About two litres of bile was sucked causing collapse of the cavity.

Further examination revealed that the cavity was a grossly distended lesser sac. Exploration of the sac with hands revealed a tear in the common bile duct from where the bile was leaking into the sac.

Probing of the duct through the tear confirmed a totally patent duct with easy entry of the Bakes' dilator into the duodenum. The tear in C.B.D. was repaired by a few interrupted catgut oo sutures.

Before closing the abdomen, two tubes were sited to provide drainage: one in the vicinity of the tear in C.B.D. and the other in the lesser sac.

Discussion

Blunt trauma, in a variety of ways, has been known to cause partial or complete rupture of C.B.D.

In adults the usual cause is the result of being thrown against the steering wheel in a head-on-collision. In some cases seat belts have been implicated.⁵

In children however the injury is usually the result of run-over accidents or crush injuries sustained between a carriage and a wall or the result of fall of a heavy bar on the right lower chest wall and right costal margin.²

A number of mechanisms either alone or in combination may produce rupture of C.B.D. :-

1. Direct compression between the costal margin and vertebral column.⁸
2. Sudden rise in intra-ductal pressure as a result of gall bladder and ductal compression against a closed sphincter of Oddi.^{6,7}

However rupture has been reported in two cases who had previously undergone cholecystectomy.⁹ In addition Fletcher failed to demonstrate rupture of C.B.D. in goats by increasing the intra-ductal pressure directly.¹¹

3. A shearing force to the C.B.D. appears to be another cause for the partial or complete rupture of the duct.¹²

A direct blow to the abdominal wall and simultaneous right costal margin compression would cause the liver to be driven upwards. Excessive traction on C.B.D. against a relatively fixed duodenum and pancreas would cause shearing where the C.B.D. meets the pancreas.^{7,12}

Whether the transection of C.B.D. is complete or partial, if it occurs as an isolated injury, the course of the illness is highly deceptive. Isolated complete transection of C.B.D. produces a clinical syndrome characterised by an insidious two-phase illness, well illustrated by the case presented by Shorthouse and Franklin.²

In isolated complete transection, an initial period of shock immediately following injury, with localized signs of peritoneal irritation in the upper abdomen, is followed by a quiescent period extending over a variable duration. This quiescent period is followed by the appearance of jaundice which is obstructive. The jaundice increases with the passage of time. Varying degree of upper abdominal pain, nausea and vomiting soon make their appearance.

On the other hand in isolated partial rupture of C.B.D., these signs are absent. As the continuity of C.B.D. is not interfered with, therefore, obstructive jaundice with associated symptoms do not appear during the course of the illness. In our case the initial symptoms of pain or peritoneal irritation might have been mild and masked by pain from the fracture of shaft of femur.

A common feature in both partial and complete tear is early appearance of distension of abdomen which continues to progress. In fact slow but progressive abdominal distension is the only sign of an intra-abdominal injury when the tear is partial. Such a distension clinically is diagnosed as ascites but an acute onset after a blunt abdominal trauma differentiates it from other types of ascites.

Peritoneal tap is the only means to confirm the existence of bile. Delay in the diagnosis is a disturbing but common finding.^{13,15} The condition is rare but the diagnosis of injury of C.B.D. should be considered when abdominal distension without any other signs and a positive peritoneal tap for bile is found.

Once such a diagnosis is made, an exploratory laparotomy should be done. While in our case it was easy to find the tear, in some cases it may be difficult to find the site of the tear: it may require operative cholangiogram.

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