Isolated pancreatic laceration in blunt abdominal trauma: two case reports with review of literature

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Patient: 15 years, male

Clinical History:

Injury to pancreas occurs in less than 2% of cases of blunt abdominal trauma. Usually there is paucity of clinical sign and symptoms. Delay may result in death mostly resulting from vascular injury. We report two cases of isolated pancreatic rupture picked up by USG and confirmed by CT.

Imaging Findings:

CASE 1: A 15-year old boy presented to the radiology department with complaints of blunt trauma abdomen. He had an accident. He was fully conscious and well oriented with all vital signs within normal parameters. Laboratory investigations including serum amylase were unremarkable. Radiographs of chest and abdomen did not reveal anything significant. As a part of routine work up in trauma unit, an US examination was performed which revealed free fluid with internal echoes in lesser sac suggestive of hemoperitoneum with evidence of complete fracture of the body of the pancreas with disruption of the pancreatic duct (Fig. 1). He was further subjected to a CT scan of the abdomen which confirmed the US findings (Fig. 2). He uderwent surgery where a primary reconstruction of the pancreas was done. He progressed well and was subsequently discharged.

CASE 2: A 35 year old man came to the ER with sudden onset of pain following a blunt abdominal trauma. History revealed that he was hit on the abdomen with a wood log. He was conscious but severity of pain was intense. He was subjected to US which revealed a clean cut tear through the pancreatic tail, and also mild collection in the lesser sac (Fig. 3). He was subjected to a CT examination of the upper abdomen which showed the tear clearly (Fig. 4). Again in this case, laboratory investigations were within normal parameters. A primary repair of the pancreas was done, progress and follow up were satisfactory.

Discussion:

Pancreatic injury is an uncommon complication of blunt or penetrating abdominal trauma [1]. Isolated pancreatic injury is extremely rare occurring in less than 2% cases [2]. The mode of injury is generally an antero-posterior compression. This has been attributed to its central and more importantly its retroperitoneal location which protects it from injury, but on other hand, it is this anatomic location which poses diagnostic challenge.

Unfortunately, no signs, symptoms, or laboratory findings are specific due to which the injury may go undetected for a long time. The laboratory investigations, in particular the serum amylase is neither sensitive nor specific [3, 4] and it may be normal in up to one fourth of cases. However a persistent elevation is definitely a more reliable indicator.
The mechanism of injury, therefore, is a major component in the evaluation of blunt abdominal trauma and therefore radiological investigations should be instituted at the earliest.

Ultrasonography is not being used routinely in pancreatic trauma because of its low sensitivity and specificity. However, it can very easily detect fluid collection/pseudocyst associated with pancreatic injury often extending to lesser sac. Detection rates for pancreatic injury have only been reported to vary from 44.9% to about 80% in various studies [5]. Although it is difficult to see pancreatic tail on US, severe injury usually affecting the body can be easily seen on ultrasonography. As in our cases, ultrasonography clearly showed pancreatic laceration along with collection in lesser sac (Fig 1).

CT scan is widely used as a screening modality for patients with suspected pancreatic/abdominal trauma and it has been reported to have a sensitivity of up to 68 – 85% [6, 7, 8]. A constellation of CT findings ranging from intra/extraperitoneal fluid collections, lesser sac fluid, hematoma, focal edema at site of injury and a thickened anterior renal fascia have been described. Also sometimes a pancreatic fracture line may be difficult to visualize owing to minimal separation of fracture segments [10]. But these findings are often subtle and rarely present in one patient [9]. An unopacified bowel loop adjacent to pancreas on contrast CT, motion and streak artifacts and suboptimal bolus enhancement are the potential disadvantages of CT scan.

Finally when pancreatic injury is suspected or pseudocyst formation had developed ERCP or MRCP is the investigation of choice in hemodynamically stable patients [6]. ERCP has been the most commonly used method for diagnosis of a presumed injury of the pancreatic duct but it has now been frequently replaced by MRCP when available. Duct injuries are manifested by an abrupt cut off of duct opacification or by extravasation of contrast medium. Unfortunately these investigations are not readily available especially in developing countries.

Most minor or isolated injuries recover well, while severe injuries are associated with poor prognosis. Complications after pancreatic injury include pancreatic fistula, pancreatic or intra abdominal abscess, pancreatitis or pseudo cyst formation. Again CT is a useful modality to detect these complications.

**Differential Diagnosis List:** Isolated pancreatic laceration in blunt abdominal trauma

**Final Diagnosis:** Isolated pancreatic laceration in blunt abdominal trauma

**References:**

Lane MJ, Mindelzun RE, Sandhu JS, McCormick VD, Jeffrey RB (1994) CT diagnosis of blunt pancreatic trauma:
Importance of detecting fluid between the pancreas and the splenic vein. AJR Am J Roentgenol 163:833-835. (PMID: 7503824)

Figure 1

Description: ultrasound picture of 1st patient showing clear laceration through the body of pancreas
Origin:
Figure 2

Description: CT image of same patient shows the laceration with sparing of splenic vein. Also seen is collection Origin:
Description: Ultrasound image of second patient shows a clear cut laceration through the tail of pancreas with co Origin:
Figure 4

Description: CT image of same patient confirms the USG findings Origin: