

Diagnostic and Therapeutic Challenges in Pancreatic Injury Following Blunt Abdominal Trauma: A Case Report

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INTRODUCTION

Pancreatic injury resulting from blunt trauma is rare but carries a high risk of significant morbidity and mortality. Traditional imaging methods often fail to detect pancreatic damage, leading to diagnostic challenges [1]. Isolated pancreatic trauma is particularly uncommon and typically occurs alongside injuries to nearby organs. Potential complications include retroperitoneal fluid collections, pancreatic fistula, ductal strictures, recurrent pancreatitis, pseudocysts, abscess formation, peritonitis, and both endocrine and exocrine insufficiency [2,3]. Although serum amylase can aid in diagnosis, it lacks both sensitivity and specificity. While computed tomography (CT) is widely used to assess hemodynamically stable patients following blunt abdominal trauma, it is not highly sensitive for detecting pancreatic injuries [4]. Contrast-enhanced CT scans can reveal direct pancreatic injuries, while non-contrast CT may show indirect signs [5]. More detailed information can be obtained through MRCP or ERCP imaging.

Key words: Pancreatic injury, Blunt abdominal trauma, Serum amylase, Distal pancreatectomy, Splenectomy, postoperative complications.

ABBREVIATIONS

FAST: Focused Assessment with Sonography for Trauma

NCCT: Non-Contrast Computed Tomography

CECT: Contrast-Enhanced Computed Tomography

USS: Ultrasound Scan

CASE PRESENTATION

A 16-year-old girl presented following blunt trauma to the upper abdomen caused by the impact of a fallen metallic gate. On the first day, she reported mild abdominal pain but was hemodynamically stable. An initial Focused Assessment with Sonography for Trauma (FAST) scan revealed no free fluid or evidence of solid organ injury.

Despite analgesics, the patient experienced persistent epigastric pain. Given the nature of the injury, a repeat FAST scan was performed, which showed a small amount of free fluid around the spleen and a possible splenic laceration. However, a serum amylase level of >2000 U/L raised a strong suspicion of pancreatic injury. A third FAST scan identified echogenic fluid around the tail of the pancreas, prompting a non-contrast CT (NCCT) of the abdomen. A contrast-enhanced CT (CECT) was initially avoided due to a reported history of anaphylaxis to medication on the same admission. The NCCT findings suggested a possible pancreatic injury.

Based on the clinical history, as well as biochemical and radiological evidence, the patient underwent an exploratory laparotomy. Intraoperative findings revealed saponification around the distal pancreas and significant inflammation involving the body and tail of the pancreas, extending to the hilum of the spleen. There was evidence of damage to the main pancreatic duct and pancreatic tissue in the middle and distal regions. Consequently, an en bloc distal pancreatectomy with splenectomy was performed.

The surgical procedure and the immediate postoperative period were uneventful. The patient was discharged on postoperative day 8 with recommendations for post-splenectomy vaccination.

On postoperative day 11, the patient returned with purulent discharge from the previous abdominal drain site. She was clinically asymptomatic and hemodynamically stable. An abdominal ultrasound revealed a hypoechoic collection in the left hypochondriac region with surrounding inflammatory changes. The primary differential diagnoses were an abscess or a collection of pancreatic secretions. Analysis of the drain site discharge showed an amylase level of 5959 U/L, and no rising inflammatory markers compared to discharging levels.

An attempt at external drainage was unsuccessful, leading to the implementation of conservative management under the guidance of a multidisciplinary team.

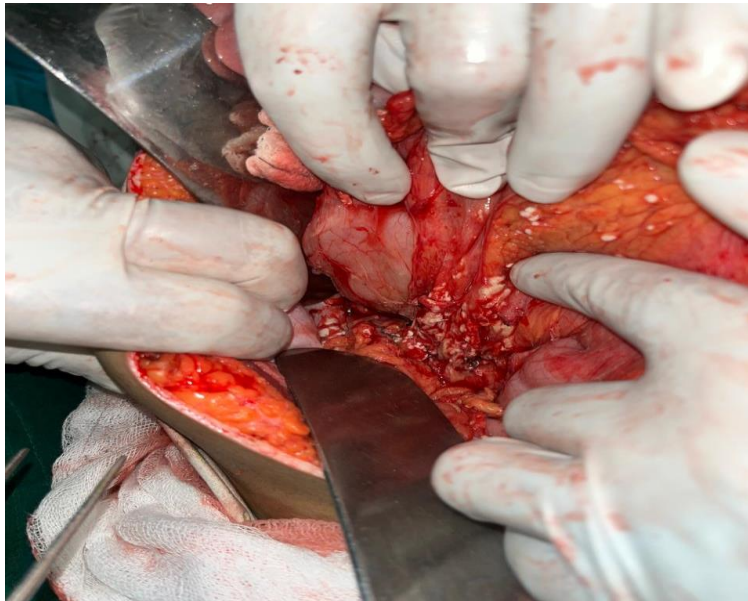


Figure 1: Intraoperative findings showing saponification surrounding the pancreas and associated pancreatic injury

DISCUSSION

Pancreatic injuries following blunt abdominal trauma are rare but carry significant risk of morbidity and mortality due to their vague presentation and diagnostic challenge. Its anatomical location in the retroperitoneum has contributed to the delayed onset of symptoms and signs. The morbidity ranges from 45%-60%, and the mortality rates range between 23.4% and 30.2% [6,7]. Patients presenting with a history of forceful anterior abdominal compression, lower thoracic or upper lumbar vertebral fractures and acceleration/deceleration injury are at risk of possible pancreatic injury [7]. In this case, the patient sustained upper abdominal trauma from a falling metallic gate and had no initial overt signs of significant solid organ damage and hemodynamic instability complicating the detection of pancreatic injury.

Routine laboratory investigations may support the suspicion. The patients with elevated leucocyte count, serum amylase or lipase may need further evaluation. According to recent studies, it was found that persistently elevated levels of combined serum amylase and lipase, taken after 6 hours of trauma, are a reliable indicator of pancreatic injury [8]. Due to its retroperitoneal location, pancreatic injuries can often go undetected on routine imaging like ultrasound, necessitating more detailed imaging studies such as contrast-enhanced abdominal CT. However, due to low sensitivity (60%-68%) for detecting parenchymal or ductal injury, CT imaging can underestimate or miss pancreatic injury and, therefore, may not help in guiding the therapy [9,10]. In our patient, elevated levels of serum amylase were directed towards the suspicion of pancreatic injury when initial FAST scans were negative. In our setting, serum lipase levels are not available freely. However, the NCCT abdomen supplemented the diagnosis, particularly given the patient's contraindication to contrast-enhanced CT. Although contrast-enhanced CT is

regarded as the gold standard for evaluating abdominal trauma, non-contrast CT can effectively demonstrate pancreatic pathology, particularly when interpreted alongside clinical and biochemical findings.

The management of pancreatic injuries is directed based on the grade and the location of injury at the pancreas. The mainstay of treatment is surgical. Minor pancreatic contusions, capsular lacerations and hematomas (Grade I) and lacerations of pancreatic parenchyma without major duct disruption or tissue loss (Grade II) are managed with adequate external drainage. Distal pancreatic injuries with involvement of the main pancreatic duct (Grade III) are best treated with distal pancreatectomy. Injuries to the head of the pancreas are graded based on severity as grade IV and V and are difficult to manage. Rarely for massive destruction of the head of the pancreas or combined pancreatic and duodenal injuries, pancreaticoduodenectomy may be required ^[7,11].

In the index case, intraoperative findings of saponification and inflammatory changes around the pancreas and splenic hilum denoted the severity, necessitating a distal pancreatectomy and splenectomy. The splenic preserving procedure was not considered as there was a suspicion of splenic vein thrombosis. Even though the postoperative period was uneventful initially, the later stage was complicated by a pancreatic leak, which is a well-recognized outcome of pancreatic surgery. Management of pancreatic leakage is mainly based on a conservative approach with external drainage. This case scenario highlights the need for clinical vigilance on possible pancreatic injury in blunt abdominal trauma with the given mechanism of injury even when the imaging may be inconclusive. Additionally, it underscores that early detection, coupled with timely intervention can prevent serious consequences.

CONCLUSION

Pancreatic injuries, although rare in the context of blunt abdominal trauma, can present considerable diagnostic and therapeutic challenges. This case emphasizes the importance of maintaining a high level of suspicion, especially when clinical symptoms persist despite initially normal imaging findings. Early diagnosis is facilitated by serial imaging and biochemical investigations, such as serum amylase levels. Timely surgical management, along with meticulous postoperative monitoring, thorough follow-up, and a multidisciplinary approach, is critical for achieving optimal patient outcomes.

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