

Isolated Pancreatic Transection Secondary to Abdominal Blunt Trauma - A Case Report

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PRESENTATION OF CASE

An 8-year-old boy presented to the Emergency Department after trauma by a bicycle hand, with injury over inferior thoracic and epigastric region. GCS: 15/15. HR: 140/min. SPO₂: 98%. Past medical history was not significant. Clinically, his abdomen was soft with tenderness over the left hypochondrium and tenderness with a patterned bruise of approximately 3*1 cms over the epigastrium. There were no features of peritonitis. Laboratory tests reported raised leucocytic count of 14,400 per dL and raised levels of serum amylase (1478 U/L). A contrast enhanced computed tomographic study of abdomen and pelvis suggested a large peripheral enhancing collection measuring approximately 37 (AP)*45 (TRANS)*55 (SI) mm replacing the entire thickness of neck of pancreas and extending into the peripancreatic fat over anterior aspect of head, neck, uncinate process and proximal body of pancreas, with eccentric non-enhancing hypodense area within representing blood clots. Final impression was that of a full thickness pancreatic laceration in neck with MPD injury-Grade III. Isolated pancreatic injury following blunt trauma to the abdomen, is not a common condition. Diagnosis can often be tricky, and it requires multiple investigations including blood reports, physical examination and radiological tests. The following report is a case of an 8-year-old male child who presented with a complete transection of the pancreas, following blunt abdominal trauma.

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DOI: 10.14260/jemds/2019/576

Financial or Other Competing Interests:
None.

How to Cite This Article:

Patel B, Chauhan H, Savsaviya J, et al.

Isolated pancreatic transection secondary

to abdominal blunt trauma- a case report. J.

Evolution Med. Dent. Sci. 2019;8(33): 2649-

2651, DOI: 10.14260/jemds/2019/576

Submission 26-06-2019,

Peer Review 03-08-2019,

Acceptance 10-08-2019,

Published 19-08-2019.

DIFFERENTIAL DIAGNOSIS

- Peptic perforation.
- Intestinal perforation (small or large bowel).
- Liver or splenic Injury.
- Pancreatitis.
- Rupture of pseudo-pancreatic cyst.
- Rupture of liver abscess (subcapsular or intraperitoneal).
- Gastritis with ulceration.

DISCUSSION

During the physical examination, pancreatic injury can be suspected in a clinical picture of penetrating injuries with flank ecchymosis. However, in many cases, it can be without symptoms or may even present with a silent picture in the early post-injury period. Rarely, a contained fracture of spleen with retroperitoneal haematoma or leak manifests as dull epigastric pain or back pain, but the more common presentation is severe peritoneal irritation with positive abdominal examination findings, usually caused by injury to other organs. The presenting clinical picture of injury to other organs usually conceal that of pancreatic injury, in early as well as late hospital course. Hence, a high grade of clinical sentience is needed to ensure that pancreatic injuries are not superseded, either early or later in the course of treatment especially if the improvement in the patient clinically is not as per expectation.



Pancreatic rupture following blunt traumatic injury to the abdomen was first described by Travers.^[1] For the injury to occur, the impact must be of a high velocity resulting into compression of the pancreas to the vertebral column.^[2] Pancreatic injuries occur in 1-5% of all abdominal injuries due to blunt force (IPT occurring in less than 1%), with an increased occurrence -12% in abdominal injuries due to penetrating trauma and a high grade of morbidity (30-60%) and mortality (10-30%)^[1-6]

Pancreatic injuries involving the neck and body are approximately 65% with approximately 35% involving the head and tail.^[3] Concurrent small bowel lesions occur in approximately 90% of the patients with pancreatic injury due to anatomically proximal location with duodenal lesions being most common along with injury to vascular structures.^[1,3,5,7] In most cases, pancreatic trauma or injury to hollow viscus result into sepsis causing death in later stages.^[5]

Following is a classification of pancreatic injury according to AAST describing hematoma, laceration, site of lesion with integrity of the pancreatic duct and its complications.^[8]

Grading	Injury	Description
Grade I	Hematoma	Mild contusion without duct injury
	Laceration	Superficial laceration without duct injury
Grade II	Hematoma	Major contusion without duct injury
	Laceration	Major Laceration without duct injury or tissue loss
Grade III	Laceration	Distal transection or parenchymal injury with duct injury
Grade IV	Laceration	Proximal transection or parenchymal injury involving the ampulla
Grade V	Laceration	Massive disruption of the pancreatic head

Table 1. Pancreatic Injury Grading According AAST

Isolated pancreatic injury following blunt trauma to the abdomen, is not a common condition- diagnosis can often be tricky, and it requires multiple investigations including blood reports, physical examination and radiological tests. Prognosis improves with a decrease in rate of morbidity and mortality if managed within time- early diagnosis and treatment.

The diagnosis of pancreatic injury is more often done intraoperatively^[1-3] during laparotomy primarily because it is difficult to establish preoperatively owing to non-specificity of the radiological tests, non-reliability of biochemical tests such as serum Lipase and serum Amylase and retroperitoneal location of the pancreas^[2,5,9,10]. Delay in diagnosis and treatment for more than 24 hours causes an increase in the morbidity and mortality rates causing complications in at least one-third of the cases such as: 1) Pseudocysts, 2) Abscesses, 3) Haemorrhage, 4) Fistulas or 5) Sepsis with Multi-organ failure.^[1,3] Elevated serum Amylase and serum Lipase tests are inconclusive tests only used to indicate the possibility of pancreatic trauma.^[1,2,7] Serum Amylase levels are raised in approximately 66%-90% of all pancreatic injuries, but at an early stage, they could be within normal limits. There is no association between pancreatic trauma grades and biochemical analysis such as serum Amylase.^[1]

Ultrasound Scanning is useful as an inexpensive and non-invasive test for detecting free fluid in intraperitoneal region or a large hematoma, but due to the retroperitoneal location of the pancreas and its duct, any specific injury in that region cannot be seen clearly. The use of ultrasound screening in children is higher^[11] However, Sato et al, demonstrated that nearly 80% of lesions to the pancreatic duct can be diagnosed by abdominal USG if done by an expert^[12].

For a clinically stable patient, Computed Tomography (CT) is considered to be the best tool for diagnosis of pancreatic

injury.^[1-3] Sensitivity of the test is 60-85%, being lower (43%) to demonstrate the integrity of the pancreatic duct.^[1,3,4] The following are clear indications of pancreatic trauma: (1) Glandular contusion, (2) Glandular laceration, and (3) transection defined by lacerations involving 50% or more thickness of the pancreas with a risk of involving the main duct). The indirect signs are: (1) peripancreatic fluid in lesser sac, (2) pancreatic hematoma or partial laceration, (3) diffuse enlargement of the gland with pancreatitis or focal oedema at the site of injury, and (4) thickening of the left anterior renal fascia.^[1-3]

Magnetic Resonance Cholangio-Pancreaticography (MRCP) is another method used in cases where the CT shows an imprecise picture. It is more advantageous than Endoscopic Retrograde Cholangio-Pancreaticography in terms of less invasiveness, faster technique, increased sensitivity (due to stimulation with secretin), and can determine anomalies not visible through ERCP such as collection of fluid upstream of the site of injury to the duct, and for assessment of pancreatic trauma^[3,7,13]. ERCP is advised for therapeutic expertise rather than diagnosis, for its high sensitivity and specificity.^[1,3]

The decisive factor for treatment is integrity of the pancreatic duct which also forms the basis for deciding the morbidity.^[1-3,7] Any disruption in the integrity of the duct requires immediate intervention whether it is surgical or endoscopy. Deferral of action for more than 24 hours, increases the rate of morbidity to twice or even thrice as much. The following are intraoperative findings indicating ductal injury: complete pancreatic transection, central perforation, severe maceration or a direct view of the lesion/injury to the duct.^[5]

DISCUSSION ON MANAGEMENT

The basis of operative care is decided by three factors: site of injury, the degree or integrity of pancreatic duct and the AAST score. Injury to the head of pancreas is managed by drainage and in some case by Whipple's procedure in stages. Injury to the body and tail is managed in most cases by a pancreatectomy which may be combined with a Roux-en-Y pancreatojejunostomy for decreasing the occurrence of post-operative complications such as pancreatic fistula,^[6,14] and in many cases splenectomy owing to the proximity of its anatomical location. Other operative techniques reported with good results^[6] such as head and neck pancreatic transection with ductal section ventral to superior mesenteric vein, that is a central pancreatectomy with a distal pancreatojejunostomy done to preserve distal pancreatic tissue to prevent disruption of the endocrine and exocrine function.

Intraoperative Findings

Intraoperatively the degree of pancreatic injury was determined to be Grade III AAST- complete pancreatic transection through the neck which was managed by distal pancreatectomy with splenic preservation. The proximal part of pancreas was closed and omentoplasty was performed. After 12 days of a successful post-operative period, the patient was discharged. Histopathological examination showed pancreatic tissue with a large haemorrhagic infarct.

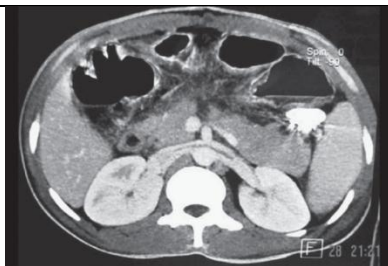


Figure 1. CT Complete Transection of Pancreas



Figure 2. Isolated Pancreatic Injury



Figure 3. Complete Pancreatic Transection through Neck



Figure 4. Distal Pancreatic Dissection



Figure 5. Pancreatic Tail Excision with Splenic Preservation

FINAL DIAGNOSIS

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