

Case Report

A rare case of blunt trauma abdomen leading to isolated grade 4 pancreatic injury

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ABSTRACT

Isolated pancreatic injury due to blunt trauma abdomen is a rare case in children and is associated with higher morbidity and mortality rates. We present a case of isolated grade 4 pancreatic injury in a 12 years old male child, presented with history of trauma to abdomen by bicycle handle, pain in abdomen, abdominal distention and vomiting. Ultrasonography of revealed hemoperitoneum with peri-pancreatic fluid collection, Contrast enhanced Computed tomography of abdomen and pelvis showed grade 4 pancreatic injury with mild hemoperitoneum. Emergency exploratory laparotomy was done and saponified part of pancreas along with omentum was debrided and Roux-en-Y pancreaticojejunostomy was performed. Procedure was uneventful and patient recovered well in post-operative period. In conclusion, isolated grade 4 pancreatic injury is a rare presentation following blunt trauma to abdomen and conservative approach as well as many operative procedures have been described for treatment of such injury. Roux-en-Y pancreaticojejunostomy procedure can be considered as a definitive treatment in such cases and to avoid long term complications.

Keywords: Blunt trauma abdomen, Isolated grade 4 pancreatic injury, Pancreaticojejunostomy

INTRODUCTION

Pancreatic injuries are rare in children.¹ They occur commonly with injuries of duodenum because of their anatomical proximity, so isolated pancreatic injuries are rare clinical presentation.² As pancreas is retroperitoneal organ, diagnosis of pancreatic injury by clinical examination is difficult, which causes further delay in the diagnosis and management which is believed to contribute in higher morbidity and mortality rates.⁵ Pancreatic injuries range from mild contusion to complete transection with ductal disruption.² Injuries are treated according to Organ Injury Scale (OIS) system of American Association of the Surgery of Trauma (AAST).³ However, the best surgical approach and treatment options remain controversial. We present a case of traumatic pancreatic injury in a child who presented

within 24 hours and prompt diagnosis was made by using CT scan, for whom Roux-en-Y pancreaticojejunostomy was done. There are many cases of blunt trauma abdomen seen but it is rare case presentation in peripheral tertiary care hospitals to be presented as isolated pancreatic injury.

CASE REPORT

12 years old male child, presented to surgical casualty with history of blunt trauma abdomen due to fall from bicycle leading to injury to abdomen with bicycle handle approximately 12 hours back. He had chief complains of abdominal pain, abdominal distention and vomiting following trauma. Patient's general condition was stable, afebrile and there were no abnormalities in his vital signs. Abdomen was mildly distended, circular abrasion was present in epigastric region, tenderness and guarding in

epigastric, umbilical and left hypochondriac region. The provisional diagnosis was kept as blunt trauma abdomen with hollow viscus perforation. Patient was evaluated further to come to a final diagnosis and further line of management.

Blood investigations showed WBC count of 10,920/ ml with increase in pancreatic enzymes (Sr. amylase – 510 U/l, Sr. lipase – 485 U/l). X ray abdomen erect was performed to rule out hollow viscus perforation, and it demonstrated the evidence of dilated bowel loops with 4 – 5 air fluid levels s/o paralytic ileus (Figure 1) and ultrasound abdomen and pelvis revealed peri-pancreatic collection (hematoma) with hemoperitoneum. So, contrast enhanced computed tomography scan of abdomen and pelvis was performed which showed the evidence of full thickness laceration in neck and proximal body of pancreas with peripancreatic fluid collection and complete transection of main pancreatic duct (Grade 4 pancreatic laceration / fracture of pancreas) with mild hemoperitoneum with no evidence of injury to other organs (Figure 2-4).



Figure 1: X-ray abdomen erect showing dilated bowel loops.



Figure 2: CT showing axial view of pancreatic laceration.

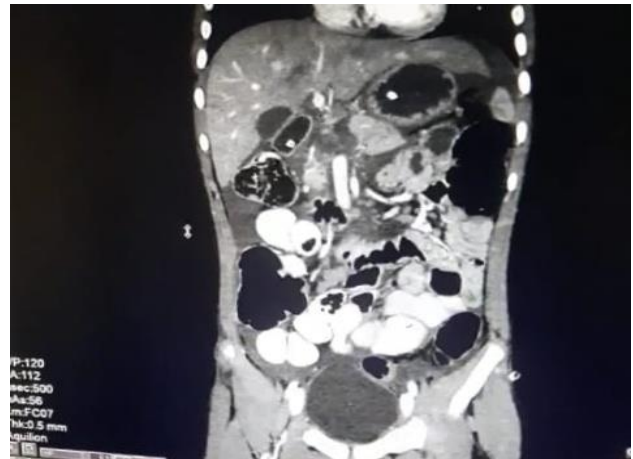


Figure 3: T abdomen coronal view showing pancreatic laceration at the level of body of pancreas.



Figure 4: CT abdomen coronal view showing pancreatic laceration with peripancreatic fluid collection.

After initial management, decision to perform operative procedure was taken. Emergency exploratory laparotomy was performed using midline vertical incision under general anesthesia. There was mild hemoperitoneum with evidence of fat saponification of greater omentum, on kocherisation, peripancreatic fat saponification was present with peripancreatic fluid collection and a laceration measuring 6×3 cm was identified at neck and body of pancreas involving superior border of pancreas with complete transection of main pancreatic duct. There was no evidence of injury to any other organ as well as major blood vessels. The saponified fat was separated from pancreatic surface.

As there was no injury to the duodenum, spleen, stomach, biliary system and pancreatic tissue embedded in 'C' of duodenum was preserved, decision to perform Roux en Y pancreaticojejunostomy was taken. As it was difficult to

use lacerated pancreas for anastomosis, anastomosis was performed by revising the pancreatic margin on distal side. The pancreatic duct was opened head to tail and the Roux jejunal limb was sutured to pancreatic capsule around the filleted duct to provide a drainage route. Later jejunojejunostomy was completed and feeding jejunostomy was performed. Abdominal drains were kept

for peritoneal drainage, one at anastomosis site and other in the pelvis. After reviewing hemostasis, abdominal wall was closed in layers without problems. The operative time was 420 min and blood loss was 300ml. The child was transferred to intensive care unit and was extubated 2 hours after the surgery and remained in ICU for observation for 5 days.

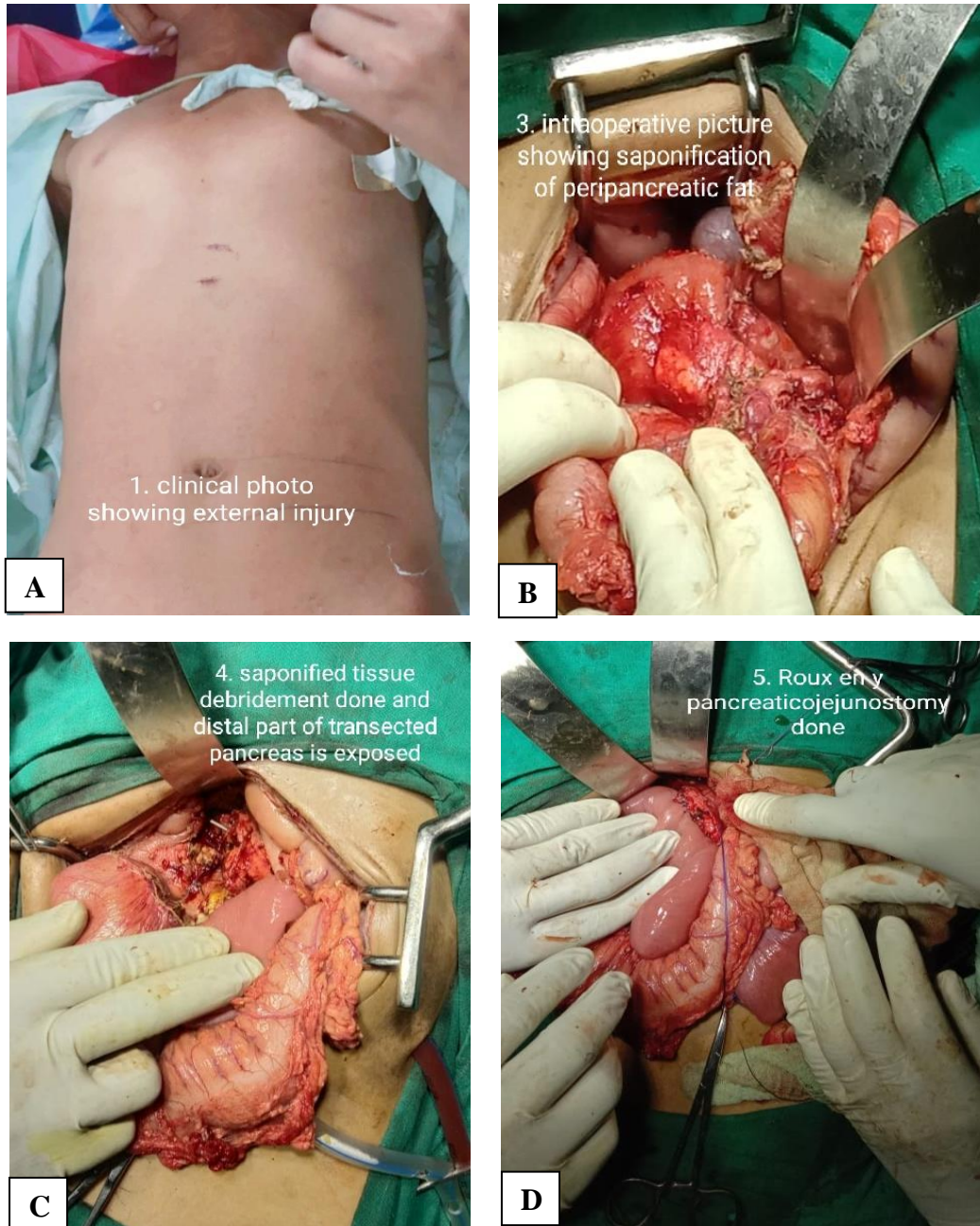


Figure 5: Intra operative images showing step wise procedure; (A) clinical photo showing external injury; (B) intraoperative picture showing saponification of peripancreatic fat; (C) intraoperative picture after saponified tissue debridement, distal part of transected pancreas exposed; (D) intraoperative picture of Roux-en-Y pancreaticojejunostomy.

The patient was haemodynamically stable throughout post operative stay. Feeding through feeding jejunostomy tube was started from post operative day 4. Oral feeding with clear liquids was started on post operative day 6. Patient was discharged with one drain on post operative day 10, exhibiting normal and uneventful feeding, healthy post operative wound and normal day to day activities. Histopathology of resected pancreatic tissue revealed acute necrotizing pancreatitis with fat necrosis and neutrophil infiltration of parenchyma. Serial drain fluid amylase and lipase levels monitoring was done to rule out leak at anastomosis site and pancreatic fistula formation. Patient returned for outpatient visit within 15 days and presented with accidental removal of intra abdominal drain, showing no signs of any distress or disease. No post operative abnormality like abscess formation, pseudo aneurysm formation, peri-pancreatic collections etc. Feeding jejunostomy tube was removed after 1.5 months of surgery. Patient recovered well. Currently, the child remains asymptomatic and practicing usual activities.

DISCUSSION

Isolated Pancreatic injuries are rare and can occur due to blunt trauma as well as penetrating abdominal injuries.⁴ Compression of the pancreas against rigid spine or by discrete intrusion forces are proposed mechanisms of pancreatic injury. Missed or underestimated pancreatic injury can lead to significant morbidity and mortality.³ For diagnosis of pancreatic injury contrast enhanced computed tomography scan of abdomen and pelvis is the method of choice in adults and children.^{5,6,8,11} CT scan can demonstrate pancreatic injuries, hematoma, complications like peripancreatic fluid collections, pancreatitis, abscess, fistula, pseudocyst formation and injuries of other abdominal organs.⁶⁻⁸ It can also demonstrate main pancreatic duct disruption. However, use of Endoscopic Retrograde Cholangiopancreatography can accurately demonstrate injury to main pancreatic duct and associated bile duct injury, especially in children.^{8,9,11}

Diagnostic relevance of CT scan can be limited. Magnetic resonance Cholangiopancreatography (MRCP) can be used with CT scan to exclude pancreatic duct injury. Use of multimodality approach for diagnosis of pancreatic injury can be helpful to overcome limitations in diagnosis.^{7,8} Pancreatic duct injuries are rare in children.⁹ The presence of main pancreatic duct injury and time of presentation of the patient are two major determinants of further management and outcome.^{15,16,18} As previously mentioned, AAST – OIS grades are useful to determine management of pancreatic trauma. Non operative management is recommended for grades I and II and more proximal ductal injuries involving head of pancreas.^{10,12} Accurate treatment for grade III or IV is controversial.

Surgical intervention varies from external drainage, suturing repair to pancreatic resection with or without

immediate reconstruction. External drainage with eventual pseudocyst formation which was dealt with electively can be an option for low grade injury.^{9,10}

Operative management depends upon the site of injury. Injuries to neck, body or tail of the pancreas with pancreatic duct injury are commonly treated with distal pancreatectomy.^{10,12} Splenic conservation can be considered in haemodynamically stable patients. Pancreatic duct injury can be successfully treated with operative management. However, management should be individualized. Endoscopic retrograde cholangiopancreatography guided pancreatic duct stenting can be performed in selected patients.^{10,11} Preservation of pancreatic tail either by primary duct repair or distal pancreaticojejunostomy, which can prevent post-operative endocrine compromise has also been described. Avoiding resection of pancreas in case of injury to the right side of mesenteric vessels and performing Roux-en-Y pancreaticojejunostomy can avoid further complications.¹⁷ For higher grade injury operative procedure can be better to avoid long term complications.²⁰

Post-operative complications include intra-abdominal abscess formation in high grade injuries which nearly always resolve with percutaneous drainage. Other is pancreatic fistula formation which most of the cases resolve on its own,² pseudocyst and rarely pancreatitis.¹⁶ Integrity of main pancreatic duct is major determinant of patient outcome.

Table 1: American Association of the Surgery of Trauma classification of pancreatic trauma-Organ Injury Scale (AAST-OIS).¹⁹

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

CONCLUSION

Isolated grade 4 pancreatic injury is a rare presentation following blunt trauma to abdomen and conservative approach as well as many operative procedures have been described for treatment of such injury. Roux – en – Y Pancreaticojejunostomy procedure can be considered as a definitive treatment in such cases and also to avoid long term complications.

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