

Pancreatic Trauma; 3 Years Experience at Allied Hospital, Faisalabad

Muhammad Akram, Muhammad Faisal Bilal Lodhi, Sumaira Kanwal, Asadullah Malik

Abstract

Introduction: Pancreatic injuries remain a clinical enigma. Minor injuries are easy to treat but if missed are associated with significant morbidity & mortality. Blunt trauma to upper abdomen is often associated with pancreatic injury. Isolated injury to pancreas is rare. There are different protocols of managing the pancreatic trauma. In this article we are presenting different cases of pancreatic trauma managed by us according to severity of injury.

Objectives: 1. To define commonest mode of presentation of patients with pancreatic trauma. 2. To suggest appropriate investigations in suspected pancreatic injuries. 3. To suggest the treatment strategy in different types of pancreatic injuries.

Study Design: Descriptive prospective study conducted in Surgical Unit III, Allied Hospital Faisalabad from Feb 2008 to Dec 2011. **Results:** Forty eight (48) patients (10 children, 38 adults)

included with median age 11 and 35 respectively. Male to female ratio 5:1. Blunt trauma was mechanism of injury in 62.5% of cases mainly due to road traffic accident. Serum amylase was raised in 59% of cases. CT scan was diagnostic in most of the hemodynamically stable patients. Roux-en-Y Pancreatojejunostomy, distal pancreatectomy and Whipple's procedure were performed depending upon the grade of injury. Postoperative pancreatic fistula formed in 26% of cases, which was managed conservatively. Overall mortality was 37.5%.

Conclusion: Pancreatic injuries commonly occur due to blunt abdominal trauma. High index of clinical suspicion is required for timely decision making. CT Scan is useful in hemodynamically stable patients. Early diagnosis and timely management according to the severity of injury improves morbidity and mortality.

INTRODUCTION

Injuries to pancreas are uncommon and account for 1-4% of severe abdominal injuries¹. Pancreatic injuries usually result from blunt abdominal trauma. Injuries following penetrating trauma are mainly due to gun shot injuries. Both types of injuries are associated with other visceral involvement². Liver, spleen, duodenum and major vessel injuries are usual association with this injury making the operative decision more complex. These injuries are often missed during the initial assessment of trauma victim. A high index of clinical awareness with due consideration to mechanism of injury is necessary to ensure that pancreatic injuries are not overlooked or missed^{2,3}. Blunt pancreatic injuries are notoriously difficult to diagnose, mostly because of retroperitoneal location of pancreas. During the physical examination seat belt marks, flank ecchymoses or penetrating injuries should alert the treating surgeon to the potential for pancreatic

injuries⁴. Use of serum amylase have been advocated for such injuries, but it is neither sensitive nor specific^{5,6}. Computed tomography has become widely accepted in the evaluation of hemodynamically stable patients with the sensitivity of this modality reported to be 60-80%⁷. Several operative maneuvers have been described to deal with complex pancreatic injuries. These procedures include distal pancreatectomy. Whipple's procedure, duodenal diverticulization, duodenal exclusion, pancreatojejunostomy and pancreaticogastrostomy. With the development of "damage control" surgery in serious trauma victims, the management of pancreatic injuries on elective list is gaining fame.

OBJECTIVES

The objectives of this study include

1. To define commonest mode of presentation of

- patients with pancreatic trauma.
2. To suggest appropriate investigations in suspected pancreatic injuries.
 3. To suggest the treatment strategy in different types of pancreatic injuries.

MATERIALS AND METHODS

This is a descriptive prospective study of all the patients with pancreatic injury admitted and managed in Surgical Unit III, Allied Hospital Faisalabad. This study covers a period of 3 years and 9 months (Feb 2008 to Dec 2011). Trauma victims (male and female) with age above 08 years were included. Patients with head injury (GCS < 9) and chest trauma were excluded from the study. The patients were resuscitated according to the principals of ATLS® by a certified ATLS® provider. Special attention was given to the mechanism of injury, diagnostic tools used, associated abdominal injuries, surgical procedure, post-operative complications and mortality. FAST (focused assessment sonography in trauma) and DPL (diagnostic peritoneal lavage) were helpful in operative decision making. Abdominal CT (computed tomography) was used in hemodynamically stable patients to detect and grade the pancreatic injuries. Pancreatic injuries were classified according to the American Association for Surgery of Trauma (AAST).

GRADE	DESCRIPTION
I	Hematoma Laceration
II	Hematoma Laceration
III	Laceration
IV	Laceration
V	Laceration

Midline laparotomy was done in all the patients, once decision for surgery was made. Damage control surgery to stop major hemorrhage and gross intestinal spillage was performed in hemodynamically unstable patients. Definitive operative procedures were performed in those who responded well to initial resuscitation.

RESULTS

A total of 48 patients were found to have pancreatic injury. There were 10 children with median age 11 years (8-12 years). For 38 adult patients median age was 35years (18-50 years). Out of these 48 patients, 40 patients were male and 8 were females. (M: F = 5: 1). Thirty patients (62.5%) in this study had pancreatic injury due to blunt abdominal trauma as a result of steering wheel and bamboo cart injury. Low velocity gunshot injury to pancreas was noted in 10 patients (21%) and stab injury in 8 (16.5%). Initial diagnosis of intraabdominal visceral injury was made by clinical findings in 28 patients (58%). Diagnostic peritoneal lavage was helpful in 4 patients (8%) to decide operative management. CT scan was performed in 6 patients (12.5%). It detected pancreatic injury in four patients preoperatively. FAST detected free fluid in 24 patients (50%). Serum amylase performed within 4 hours of injury in 22 patients and was raised in only 13 patients (59%). Thirty six patients (75%) had multiple organ injuries whereas twelve (25%) had isolated pancreatic injury. The commonest organ damaged along with pancreas was the liver (12 cases, 33%). Organs involved according to frequency are listed in table-1.

Table-1
Frequency of associated organ injuries

Organs involved (n=36)	Frequency (%)
Liver	12 (33%)
Spleen	6 (16.6%)
Colon	6(16.6%)
Stomach	4 (11%)
Left Kidney	3 (8%)
Doudenum	3 (8%)
Rt.kidney	2 (5.5%)

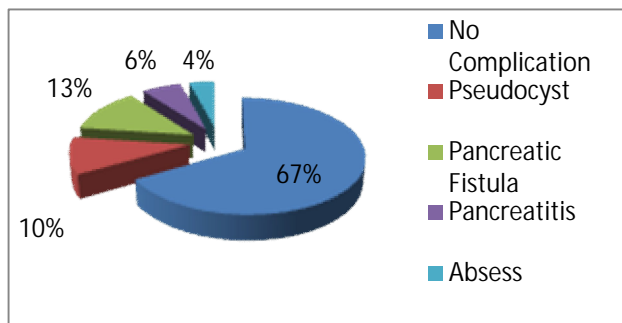
Table-2
Distribution of pancreatic injuries according to AAST scale and their management

Grade	No. Of Patients (n=48)	Management
I	3 (6.25%)	Non-operative
II	10 (20.8 %)	Drainage
III	09 (18.75)	Distal pancreatectomy
	06 (12.5)	Distal pancreatectomy with splenectomy
IV	16 (33.3 %)	Pancreatojejunostomy
V	4 (8.3%)	Whipple's procedure

Grade I pancreatic injuries were managed conservatively. Grade II injuries were managed by drainage of the lesser sac except in one case where pyloric exclusion was done. In Grade III injuries distal pancreatectomy and splenectomy was performed in 6 cases and spleen preservation was done in 9 cases. Grade IV injuries were managed by pancreatojejunostomy with ROUX-en-Y reconstruction. In Grade V, Whipple's procedure was performed in 4 patients; two of these patients were initially managed in the concept of damage control in emergency department. After 24 hours extensive surgical intervention was performed in the form of pancreaticoduodenectomy (whipple's).

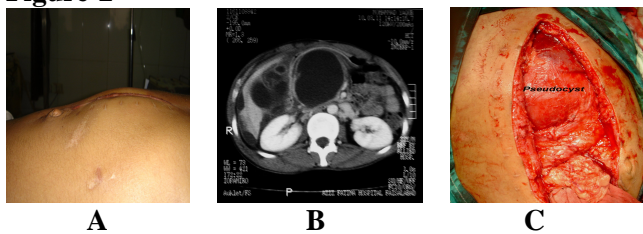
Overall mortality was 6.25 % (03 patients out of 48). All these patients had multiple organ involvement supporting the fact that multiple organ injuries have high mortality. Major postoperative complications included pancreatitis, pancreatic fistula, intraabdominal abscess and pseudocyst formation (Figure.1).

Figure-1
Complications of Pancreatic injuries



Patients developing pancreatic fistula were managed conservatively and recovered within 6-8 weeks. Two patients with abscess formation required surgical drainage. Out of five patients having postoperative pseudocyst only one required cystogastrostomy which was done two months after initial surgery. (Fig.2 a,b,c).

Figure-2



- Preoperative picture of patient showing scar of midline laparotomy and swelling due to pseudocyst
- CT Scan of the same patient
- Peroperative picture showing the retrogastric pseudocyst

DISCUSSION

Pancreatic injuries are still a challenge for trauma surgeon. Difficulties in timely diagnosis are associated with high mortality and morbidity. Overall mortality ranges from 9-34% and complication rate is reported to be 30-60%⁸. Male population is affected more during trauma and more so in 3rd decade of life. Our study have shown male to female ratio of 5: 1. Almost similar male preponderance has been noted by Scollay JM et al⁹. The mean age in our study is 11years in pediatric age group and 35years in adult age group. Similar frequency has been noted in different multiinstitutional studies^{10,11}. A high index of suspicion is required for making the diagnosis. All the patients who receive a high energy direct trauma to the epigastrium, such as a child who receive a handle bar injury or an adult sustaining a steering wheel injury and bombo cart injury should be investigated for pancreatic injury¹¹. Blunt abdominal injuries were responsible for pancreatic injuries in majority of the patients in our study. Isolated serum amylase is not a reliable indicator of pancreatic trauma. Serum amylase performed within 4 hours of injury in 22 patients and was raised in only 13 patients (59%). Serial values of serum amylase are more significant than a single value^{5,6}. Abdominal CT Scan in diagnosing pancreatic injuries has a reported sensitivity and specificity of 70% and 80% respectively. But the accuracy of investigation is dependent on the quality of the scanner, time since injury and the interpreter⁷. In our study CT confirmed pancreatic injury in four out of six hemodynamically stable patients.

Majority of patients in this study were diagnosed to have pancreatic trauma on exploratory laparotomy indicated by Zone-I hematoma. The most important point in the management of the pancreatic injury is to identify the major duct injury usually associated with complete transaction of pancreas. MRCP and early ERCP are used at advanced centers for such injuries. Diagnostic laraoscopy with laparoscopic ultrasonography and endoluminal (transesophageal) ultrasonography are the emerging investigations for

preoperative diagnosis of pancreatic injuries^{12,13}. We managed pancreatic injuries according to severity and grade of injury. This management has shown good results in terms of low morbidity and mortality. Similar management has been documented in different studies^{14,15}. In Grade I & II injury simple drainage with wide bore catheter in the lesser sac was provided. In Grade III injury distal devitalized pancreas was removed and stump of pancreatic duct was identified and ligated. Grade IV injuries were managed by Roux-en-Y Pancreaticojejunostomy. We managed four patients with Grade V injury. In two patients emergency whipple's operation was done and two cases were operated on next elective list after damage control surgery in emergency. Pancreatic fistula is the commonest post-operative complication. In our study 12.5 % (06) of the patients developed pancreatic fistulae, we managed these cases conservatively and these closed spontaneously within 6-8 weeks. This management included replacement of fluid and electrolytes, partial parenteral nutrition and use of octreotide. In current practice total parenteral nutrition is used. It has the advantage of eliminating pancreatic stimulation caused by enteral feeding and may speed the resolution of pancreatic fistula^{13,14}.

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AUTHORS

- **Dr. Muhammad Akram**
Assistant Professor Surgical Unit-II
PMC/ Allied Hospital, Faisalabad
- **Dr. Muhammad Faisal Bialal Lodhi**
Associate Professor Surgical Unit-II
PMC/ Allied Hospital, Faisalabad
- **Dr. Sumaira Kanwal**
Senior Registrar Surgical Unit-II
Allied Hospital, Faisalabad
- **Prof. Dr. Asadullah Malik**
Professor of Surgical Unit-II
PMC/ Allied Hospital, Faisalabad