

Pancreatic Trauma - A Management Conundrum, whether to Operate or Not to Operate and Management of Complications: A Study from a Tertiary Care Hospital in South India

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Abstract

Introduction: Abdominal trauma has become one of the leading causes of mortality and morbidity around the world. There is much confusion about the management of pancreatic trauma. We present our data on the management of pancreatic trauma.

Materials and Methods: A retrospective analysis of trauma patients between October 2002 and October 2018 was carried with analysis of demographics, mode of trauma, grade of pancreatic trauma, and treatment and management of complications.

Results: A total of 506 patients with abdominal trauma were admitted with abdominal trauma, 32 patients with pancreatic injuries. 28 patients suffered blunt trauma and 4 patients had penetrating trauma. All patients with penetrating injuries underwent emergency laparotomy. Nine patients suffered Grade I injury, seven Grade II injury, eight with Grade III, and four each with Grade IV and Grade V injuries. All patients with Grade V injuries were operated with one mortality due to laceration of retrohepatic trauma. All patients with Grade I and II injuries with blunt injury were managed non-operative management (NOM). Four patients with Grade III injuries were operated initially due to sepsis. Four patients with Grade III injuries were managed initially with NOM with three operated later failure of NOM due to complications.

Conclusion: Pancreatic injuries should be managed non-operatively initially except for Grade V injuries and complications arising out of NOM could be managed later with lower morbidity and mortality.

Key words: Complications, Management, Non-operative management, Pancreatic trauma

INTRODUCTION

Trauma has become quite an important cause of morbidity and mortality around the world. Around 1.35 million people die in road traffic accidents every year and have become one of the leading causes of death among young people.^[1] Abdominal trauma forms an important cause of these mortalities. Injury to the pancreas is a rare occurrence, as the pancreas is a well-protected retroperitoneal organ.

Pancreatic injuries take a heavy toll as it is associated with high morbidity and mortality. We present our data and analysis on pancreatic injuries in a tertiary care hospital in South India.

MATERIALS AND METHODS

The case records of abdominal trauma patients admitted in a single unit in our hospital between October 2002 and October 2018 were retrieved. The demographic profiles of these patients were recorded and out of these those patients who had suffered pancreatic injuries were segregated. Apart from the demographic details, we investigated the mode of injury, grade of pancreatic injury, and modality of treatment and management of complications. The American Association for the Surgery

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of Trauma (AAST) classification was used to grade all pancreatic injuries.

RESULTS

A total of 506 patients with abdominal trauma were admitted between October 2002 and October 2018. 354 of these were male and 152 were female. The median age was 28 years. Of these patients, there were 32 patients with pancreatic injuries. 20 were male and 12 were female patients [Figure 1]. The median age was 26 years. There were nine patients with Grade I injuries, seven with Grade II, eight with Grade III, four with Grade IV, and four patients with Grade V injuries [Figure 2]. 24 patients had suffered blunt trauma, four had fallen from height while four patients had suffered penetrating injuries [Figure 3]. All Grade V injuries were associated with disruption of the second part of duodenum. Other associated injuries were liver injuries in 18 patients, splenic injuries in 14 patients, rib fractures in 20 patients, fracture of lumbar vertebrae in 20 patients, and pelvic fractures in 6 patients [Figure 4]. Four patients, who had penetrating injuries, underwent emergency laparotomy. There was extensive small and large bowel injury in one patient, gastric perforation in

one patient, and other two had mesenteric injuries of small bowel. Of these four patients, two patients had pancreatic contusions to the left of superior mesenteric vein amounting to Grade I injury and one patient had laceration of the pancreas to the left of the superior mesenteric vein without ductal injury accounting for Grade II injury. One patient had laceration of retrohepatic vena cava. The rest of the three patients were not bleeding intraoperatively and no further intervention was carried out. We could not clearly ascertain bowel contusions or mesenteric tears among blunt injury patients as most of the patients were managed non-operatively. Among the Grade V injuries, three injuries were due to blunt trauma and one was due to penetrating trauma. The incidents of injury of all these patients had taken place within a radius of 4 kms around our hospital and all these patients were operated with an hour of reaching the hospital. Emergency Whipple's pancreaticoduodenectomy was carried out in three of these patients. For the remnant pancreatic stump, the anastomosis carried out was pancreaticogastrostomy in two and pancreaticojejunostomy in one patient. One patient had an associated laceration of retrohepatic vena cava and had unfortunately died intraoperatively due to hypovolemic shock. All Grade IV patients except one were managed conservatively. One patient with Grade IV injury had complete avulsion of common bile duct and underwent hepaticojejunostomy with pancreatic duct stenting. Patients with Grade I and Grade II injuries due to blunt trauma with no ductal disruption were managed conservatively without

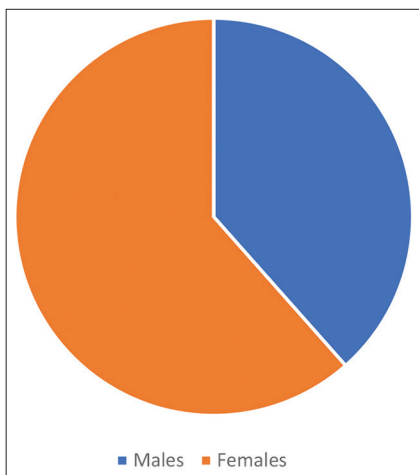


Figure 1: Gender distribution of pancreatic trauma

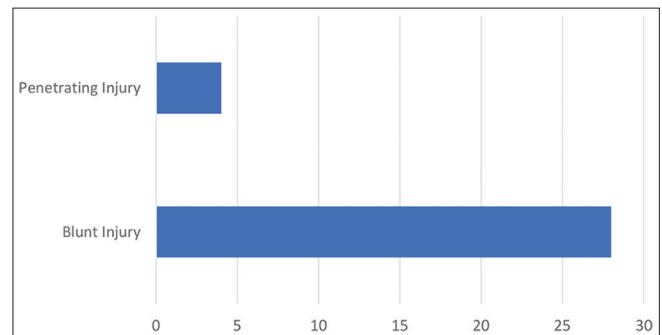


Figure 3: Modes of injury

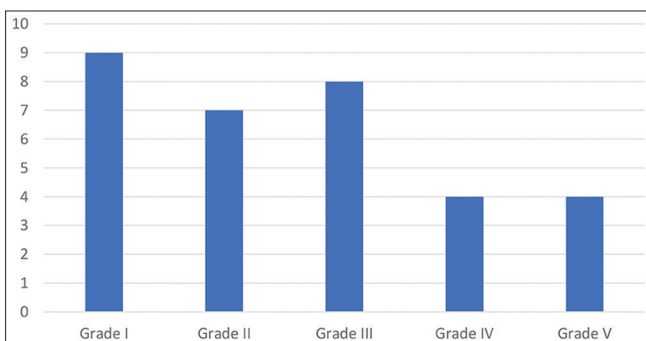


Figure 2: Grades of pancreatic injuries

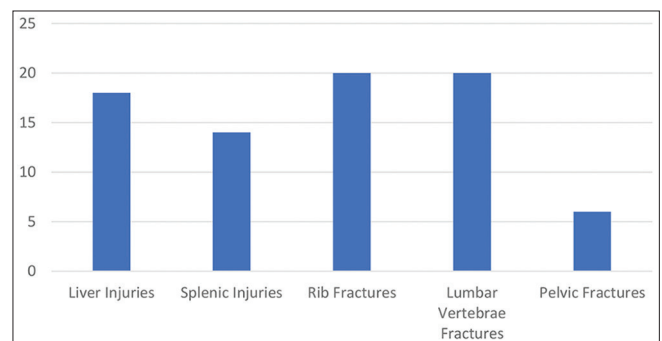


Figure 4: Associated injuries of other organs

developing any complications. Among the eight patients with Grade III injuries with pancreatic duct disruption, four patients presented to us late beyond 1 week of injury after they were managed initially in another hospital and referred to us for the associated complications such as fever, pancreatic ascites, necrosis, and localized collections. Of the eight patients with Grade III injuries, four patients developed high-grade fever due to necrosis and collection; they underwent necrosectomy and drainage. One of these four patients required further two laparotomies and drainage of collections. Of the remaining four patients, two were pigtailed for peripancreatic collection and underwent subsequent laparotomy and debridement of walled of the necrosis later. One patient developed pancreaticopleural fistula and was treated with intercostal drainage and pigtail drainage of peripancreatic collection. One patient developed pancreatic ascites due to complete disruption of main pancreatic duct to the left of superior mesenteric vein. A pigtail drainage of the peripancreatic collection was carried out followed by necrosectomy later.

DISCUSSION

The study is a retrospective study on pancreatic injuries in a tertiary care hospital in South India. We have used the AAST classification^[2] for assessing the pancreatic injuries. In our series, pancreatic injuries form about 6.3% of abdominal trauma. Grade I injuries form the most common presentation making up to 28.12% of injuries, closely followed by Grade III injuries with 25%. There was equal number of Grade IV and Grade V injuries each with 12.5% share. In a large series by Siboni *et al.*,^[3] pancreatic injuries formed 3.1% of abdominal injuries with Grade II injuries forming the bulk of the injuries at 82.7% followed by Grade II with 7.9% injuries with Grade IV and V making 5.5% each. In a series by Gupta *et al.*^[4] from India, looking into 4 years data with 53 pancreatic injuries, blunt trauma was the most common cause of pancreatic injuries as in our series. The study reveals Grade III injuries as the most common presentation of pancreatic injuries. This is comparable to data from our series. Both our series and the data from Gupta *et al.* are from referral institutes in India where more complex injuries tend to present, whereas the series from Siboni *et al.*, sf from a National Trauma data bank that is representative of the whole population from a western.

Solid organ injuries of the abdomen due to blunt trauma are increasingly being managed by non-operative management (NOM).^[5] There has been a significant shift in the management of blunt injuries of the pancreas from operative management to NOM. In a national trend reported by Ragulin-Coyne *et al.*^[6] in 27, 216 patients with pancreaticoduodenal trauma, patients, the percentage of

patients managed by operative management showed a significant decline from 21.7% to 19.8% overtime, whereas non-operatively managed patients showed a significant increase from 56.7% to 59.1%. There was a significant decline in mortality among the non-operatively managed patients. The study reported the presence of combined pancreatic and duodenal injury, penetrating trauma, and age >50 years as independent predictors of mortality.

All our Grade I and Grade II injuries were managed non-operatively and they did not show any further complications. There is not much controversy regarding management of Grade I and II injuries as there is no duct disruption and could be managed non-operatively. It is with Grade III injuries upward that there has been a change from operative to NOM.^[7] The options of NOM would be observation (NO-endoscopic management [EM]), EM, and pigtailling. In a study on 132 patients,^[8] Kong *et al.* showed the proportion of the failure of NOM (FNOM) to be 20%, with 30% in NO-EM group and 9% in EM group. Addition of EM significantly reduced the FNOM rates in Grade III patients. The success rate of NOM is higher among Grade I and II patients compared to Grade III, IV, and V patients. NOM management carries the risk of pseudocyst formation which can, however, be managed conservatively later on.^[9] The presence of necrosis and necrosis and associated other organ injuries seem to predict the failure of NOM of pancreatic trauma.^[10] In our series, we had eight patients with Grade III injuries. Four of these had developed sepsis and had to undergo necrosectomies. The remaining four were managed non-operatively, with pigtailling initially. Two patients underwent necrosectomies late as their sepsis had not controlled with NOM. One patient with pancreatic fistula^[11] was treated with intercoastal drainage, whereas one patient who had developed pancreatic ascites, had pig tailing initially, and underwent necrosectomy due to the failure of NOM. Thus, we had FNOM in seven of eight patients in Grade III injuries. Distal pancreatectomy has been described for Grade III injuries with significant ductal disruption.^[12] However, distal pancreatectomy has shown higher morbidity and mortality than by treating the patient with initial NOM and later deal with pseudocyst or walled of necrosis.^[13]

We had three patients with Grade V injuries. All these patients had suffered their injuries within a radius of 4 km from the hospital. All these patients had undergone emergency laparotomy. However, unfortunately, one patient had died on the operating table due to exsanguination from an injury to major vessel. We had one mortality that was due to injury to retrohepatic vena cava. Mortality in pancreatic trauma in the earlier stages is due to bleeding and in later stages due to infection and sepsis.^[12]

CONCLUSION

Pancreatic injuries are rarer injuries in abdominal trauma. The injuries should be managed non-operatively initially except for Grade V injuries, and complications arising out of NOM could be managed later with lower morbidity and mortality.

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