

Conservative surgical treatment of pancreatic injuries

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Seven cases of pancreatic injuries of various severity ranging from grade I to grade IV treated by closed tube drainage are presented. Only one patient (14%) developed pancreaticoduodenal fistula postoperatively which was managed conservatively and closed within four weeks. Simple drainage is a satisfactory method in the treatment of pancreatic injuries. [Turk J Med Res 1994; 12(2): 83-86]

Key Words: Injury, Pancreas, Surgery

Pancreatic injury is one of the uncommon intra-abdominal injuries, usually induced by forcible compression of the pancreas against the vertebral column, with disruption of pancreatic tissue and possibly interruption of the ductal system and release of pancreatic enzymes leading to necrosis of the neighbouring tissues and retroperitoneal irritation.

Various surgical procedures have been used in management of pancreatic injuries ranging from simple drainage to most demanding surgical operation such as pancreato-duodenectomy with a significant morbidity and mortality.

Results of simple drainage in management of seven cases of pancreatic injuries are presented.

PATIENTS AND METHODS

Seven patients with pancreatic injuries with signs and symptoms of peritoneal irritation and internal bleeding that warranted exploration of the abdomen, were treated in Kirkuk Hospital during the period from Oct. 1987 to Jan 1990. They were all male and their age ranged from 6 to 28 years. Mechanism of the injury was blunt in 5 patients and penetrating injury by gunshot in 2 patients. In all patients of this series, the diagnosis of pancreatic injury was done intra-operatively. The patients were graded according to the Locas classification (1):

Grade I: Simple superficial contusion with minimal parenchymal damage (3 patients).

Grade II: Deep laceration, perforation or transection of the body or tail of pancreas (One patient).

Grade III: Severe crushing, perforation or transection of the head of the pancreas (0).

Grade IV: Combined pancreato-duodenal injuries (3 patients).

Basic principles of the management of the patients included: active resuscitation, hemostasis, proper treatment of associated injuries, adequate drainage and supportive post operative care. Emergency exploratory laparotomy was performed through a long midline incision. The priority was to arrest the haemorrhage and limitation of any further contamination of the peritoneal cavity. The pancreas approached through the gastrocolic omentum and any haematoma around the pancreas and duodenum were explored by Kocherization of the duodenum. The pancreatic head and retroperitoneal portion of the duodenum were examined for any injury. This policy was successful in detection of the retroperitoneal rupture of the duodenum by blunt mechanism in Case No 3, which would have been easily missed otherwise. Duodenal tears were repaired in two layers and all other associated injuries were dealt on appropriately. A tube drain was left adjacent to the site of the pancreatic injury and the abdomen closed with continuous monofilament Nylon. All patients had uneventful post-operative course apart from a pancreato-duodenal fistula and wound sepsis that developed in Case No 1 and pulmonary atelectasis that occurred in Cases No 1 and No 2.

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RESULTS

Pancreatic injuries are uncommon, caused by either blunt (71.5%) or penetrating injury (28.5%), with predominance of young males (all patients in this series) and accompanied with high incidence of associated intra-abdominal injuries that included; duodenum in 3 patients, spleen in 3 patients, colon in 2 patients, stomach in 2 patients, small intestine in 1 patient and kidney in one patient (Table 1). Colonic injuries are common in penetrating injuries and this increases the incidence of wound sepsis as it is evident in Case No 1. Combined pancreato-duodenal injuries were more common in penetrating injuries.

All patients were managed by closed tube drainage and all did well apart from case No 1 who developed pancreato-duodenal fistula (14%) which was managed conservatively by total parenteral nutrition, protection of the skin and maintenance of the fluid and electrolyte balance. The fistula closed spontaneously toward the end of the 4 th week. Pancreatic fistula is more common in pancreatic injuries involving the head of the pancreas and this occurred in one out of three patients with pancreato-duodenal injuries (33%). Hospital stay of all patients were about 10 days with excep-

tion of Case No 1 who developed pancreato-duodenal fistula and stay in hospital for 32 days.

DISCUSSION

Retroperitoneal position of the pancreas is unique that the diagnosis of pancreatic injury is generally delayed unless other intra-abdominal injuries necessitating laparotomy are present where the diagnosis of pancreatic injuries is usually made as in our cases. Pancreatic injuries were associated with high incidence of intra-abdominal injuries which correlates well with other reports (2). Different diagnostic tools were used with varied limitation in diagnosis of pancreatic injuries. Serum amylase is generally unreliable and peritoneal lavage with measurement if amylase level may be useful. Although detection of abnormal thickening of anterior renal fascia by computed tomography is helpful in diagnosis of pancreatic injury but it may be normal in 40 % of patients (3). Endoscopic retrograde cholangiopancreatography are of more value in diagnosis of remote complications of a -missed injury (4-6). Various surgical procedures-are designed for pancreatic duct, the degree of parenchymal damage and the anatomic location of, the injury (7). Simple

Table 1. Demonstrates the mechanism, anatomic locatior, grade of the pancreatic injury, the associated intra-abdominal injuries, the operative procedures which were carried out and the main postoperative complications that followed such procedures.

	Case No 1	Case No 2	Case No 3	Case No 4	Case No 5	Case No 6	Case No 7
Age (years)	16	19	20	23	28	6	10
Mechanism of Injury	Gun Shot	Gun Shot	Blunt	Blunt	Blunt	Blunt	Blunt
Location of injury in the pancreas	Head	Head	Head	Body	Body	Tail	Tail
Grade of injury	IV	IV	IV	I	I	I	
Associated injuries	Duodenum Right Kidney Colon Stomach Small intestine	Duodenum Colon Stomach	Duodenum Retroperitoneal	Liver	Spleen	Spleen	Spleen
Operative Procedures	Duodenal repair R.Nephrectomy Colostomy	Duodenal repair Colostomy Repair of stomach	Duodenal Repair	Hepatic repair	Splenic repair	Splenectomy	Splenectomy
Post-operative	Pancreato duodenal Fistula Wound sepsis Pulmonary	Pulmonary Aelectasis					

drainage as used in our cases is considered a proper method in management of grade I and grade II pancreatic injuries when the main duct is intact (7), while pancreatic injuries with disruption of pancreatic duct to the left of the mesenteric vessels are usually treated by distal pancreatectomy and drainage (8-12) and only Roux-en-Y loop to drain injuries of the duct at the head of the pancreas (10). For visualisation of the ductal system, intra-operative pancreatography through amputated tail of pancreas or by cannulation of the ampulla of Vater through a duodenostomy is advocated by some surgeons, (2,8) but this was not found necessary in our cases. Pancreato-duodenectomy for grade IV injuries is a radical operation with considerable mortality rate. Duodenal diversion by pyloric exclusion (13) or duodenal diverticulization method is satisfactory in dealing with grade IV injuries is a radical operation with considerable mortality rate. Duodenal diversion by pyloric exclusion (13) or duodenal diverticulization method is satisfactory in dealing with grade IV injuries. These are designed to divert the stream of gastric contents away from the duodenum, thus allowing healing and decreasing pancreatic and biliary secretions. In our cases pancreato-duodenal injuries (Case No 1,2,3) were managed by repair of duodenal injury in two layers and closed tube drainage of the pancreatic injury. This was succesful in two cases (Case No 1 and No 3) and failed in case No 1 who developed pancreato-duodenal fistula that closed spontaneously with administration of total parenteral nutrition for four weeks. It is well known that pancreatic fistula resulting from a missed injury to ductal system will close spontaneously by conservative management (14). It is also reported that fistula with incidence ranging from 20 to 47%, are more common in injuries involving the pancreatic head, especially when the main duct is injured (9), corresponding with our result of fistula in one out of three patients with pancreático duodenal injuries (33.3%).

It is well established that postoperative abdominal complications are related to the grade of the pancreatic injury (15), mechanism of the injury (2) and presence of associated intra-abdominal injury especially the colonic injury (16). In our cases post operative intra-abdominal complication was limited to case No 1 (fistula and wound sepsis) who had sustained a bullet injury with grade IV pancreatic injury and was associated with multiple intra-abdominal injuries (Table No 1).

Other complications of pancreatic injury that are reported includes: Abscess formation with an incidence of 10 to 25%, usually develops as a result of associated injuries to adjacent viscera (9,11,12,14,15,17,18) especially colonic injury (16), pseudocyst 2% (9,12,17,18) postoperative hemorrhage

5-10% (12,17,18) and panceatitis with high risk of death (12,17). It is also stated that septic complications after pancreatic injury are significantly reduced by closed drainage, in contradiction to sump suction drainage which is considered as major source of intra-abdominal infections via bacterial contamination of the sump catheters (19). None of these complications were observed in our patient. Isolated pancreatic injuries have mortality rate of 3-10% (9,20) but this rate is generally higher when associated injuries are present. It is higher in penetrating injuries (22%) compared with blunt injury (19%) (8). No death have occurred in our cases.

The closed tube drainage was effective in drainin of pancreatoduodenal secretions and in prevention of soiling of the peritoneal cavity and abdominal pañetes by pancreatic juice. Therefore closed tube drainage is a satisfactory method in management of the pancreatic injuries and we advocate it especially when the circumstances does not permit to add more risk to the qpatient by performing a more complicated surgical procedures in inconvenient situations.

Pankreas yaralanmalarının konzervatif cerrahi tedavisi

Grade I ile grade IV arasında değişen şiddette pankreas yaralanması olan ve kapalı tüp drenajı ile tedavi edilen yedi vaka sunulmuştur. Sadece bir hastada (% 14) postoperatif dönemde pankreatikoduodenal fistül gelişti ve konservatif olarak tedavi edildi ve 4 hafta içinde kapandı. Pankreas yaralanmalarının tedavisinde basit drenaj yüz güldürücü bir metoddur. [Turk J Med Res 1994; 12(2): 83-86]

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