ORIGINAL ARTICLE

Pancreaoto-Dudenal Trauma: Our expeariance at King Abdullah Hospital, Bisha-KSA

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Abstract

Background: Pancreatic and duodenal injuries are uncommon and need high index of suspicion for diagnosis. Most duodenal injuries can be adequately managed with primary repair or resection and anastomosis. Surgical options for varying degrees of injury was evaluated in a large volume trauma unit in Kingdom of Saudi Arabia.

Patients and Methods: Records for 41 patients managed for pancreatoduodenal injury between 3rd January 2013 and 30th December 2016 were reviewed to identify Grades of pancreatoduodenal injury and their management.

Results: 41 patients had pancreatoduodenal injury. Patients were between the ages of 11 and 51 years. Male: female ratio was 3.2:1. 12 cases with Grade 1 injuries were managed conservatively. 17 patients with Grade 2 injuries had primary repair and 2 large bore drain placed in the peritoneal cavity and feeding jejunostomy done . 10 patients with Grade 3 injuries were also managed with primary repair and two large bore drain were placed one at the site of repair and one in the pelvic cavity and feeding jejunostomy done. 1 case with Grade 4 injury managed with pyloric exclusion.1 case with Grade 5 injury managed with Whipple's procedure. No mortality is noted in the present study.

Conclusion: Experience and multidisciplinary approach are essential to successful management of pancreatoduodenal injuries. Where possible, conservative approach and staged management should be adopted.

Keywords: pancreatoduodenal injury, pyloric exclusion, whipple procedure, triple ostomy drainage.

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Introduction:

Management of pancreatoduodenal injury is one of the most difficult challenges for a trauma surgeon. These injuries are not very common as the pancreas and duodenum are retroperitoneal structures. The abdominal injuries like solid abdominal organs injuries or hollow viscus injuries are usually diagnosed without much of a problem. As the symptoms become obvious in the early stage of management and signs of peritonitis become visible. There these injuries can be managed without much of a problem. In the case of pancreatoduodenal injuries the symptoms are masked as there are no symptoms indicating peritonitis. Therefore these injuries can be missed.

To diagnose these injuries a clinician should have high index of suspicion, careful history should be taken and clinical examination should be performed. Complete blood count, chemistry and plain abdominal radiography should be obtained. Focused abdominal sonography for trauma (FAST) should be done and contrast enhanced Computed Tomography of the abdomen should be performed. Endoscopic Retrograde Cholangiopancreatography (ERCP) and Magnetic Resonance Imaging should be done in selective cases.

Material and Methods:

This is a retrospective study, carried out at King Abdullah Hospital, Bisha, Kingdom of Saudia Arabia (KSA) from 3rd January 2013 till 30th

December 2016. 41 cases of pancreatoduodenal injuries were managed during this period. Careful history were taken from these patients followed by clinical examination. Demographic data, clinical presentation, findings at laparotomy and outcome were documented, on specially designed performa. This study was conduted after the approval of ethics committee of King Abdullah Hospital, Bisha. Data was then entered and analyzed on SPSS version 21.00. Statistical Package for the Social Sciences Software (SPSS, version 21) is used for analysis. Quantitative variables were presented as mean and standard deviation. Qualitative variables were presented in terms of frequency and percentages. All patient had routine investigation. Plain radiographs, ultrasound and contrast CT were done. ERCP and MRI were done in selected cases.

Results:

A total of 41 patients were managed over this period with a male/female ratio of 3.2:1. Injury mechanisms were gunshot (5 cases) and blunt trauma (36 cases) Figure 1.

Their ages range from 11 to 54 majority being between 20-30 years. Out of 41 cases, 12 had grade 1 duodenal and pancreatic injuries and were successfully managed conservatively with nil by mouth, intravenous fluid and rest to the bowel. Serial CT was done to see the progres 17 cases had Grade 2 duodenal injuries (Figures 3 and 4) which required laparotomy and primary closure of the duodenal injuries. Here we inserted two large bore drain in the peritoneal cavity one beside the repair and another in the pelvic cavity. Stomach is decompress by nesogastric tube and feeding jejunostomy performed (Figure 5). There were 10 cases of Grade 3 duodenal injury which was again treated with primary repair and draining of the the stomach was done with nasogastric tube. Feeding jejunostomy performed and two large size drain placed. There was 1 case of Grade 4 duodenal injury which was managed by pyloric exclusion and gastrojejunostomy and closure of the duodenal perforation was performed (Figure 6). Fortunately there was no injury to the papilla. Feeding jejunostomy was also performed. The patient had a smooth recovery. There was 1 case of Grade 5 pancreatic injury requiring emergency Whipple procedure. Gastrojejunostomy, choledochojejunostomy and pancreatojejunostomy done. Two of the patients developed duodenal fistula and were managed conservatively. Fortunately we had no mortality in the present study.

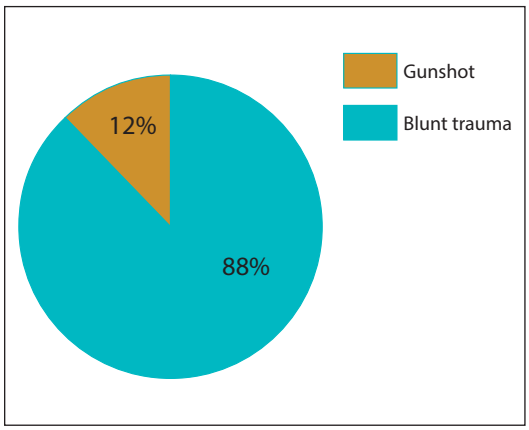

Figure 1: Mechanism of injury

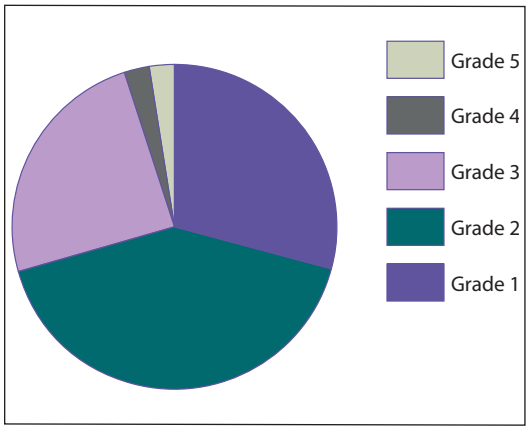

Figure 2: Grades of deudeno pancreatic injury in the present study

Discussion:

The incidence of pancreatic and duodenal injury is low with pancreatic injuries ranging between 1 to 9% and duodenal injuries 3 to 5% of all abdominal injuries. The penetrating injuries are 3 to 4 times more common than blunt injuries .

Though traumatic pancreatic and duodenal injuries are rarely isolated.[1] Identification requires

Table-1: AAST Classification of pancreatic trauma

	Grade	Injury description
I	Haematoma	Minor contusion without ductasl injury
	Laceration	Superficial laceration without ductal injury
II	Haematoma	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 trasnsection or pancreatic parenchymal injury involving the ampulla
V	Laceration	Massive disruption of the pancreatic head

Table-2: AAST Clasification of duodenum injury
Duodenum Organ Injury Scale According to AAST (American Association for the Surgery of Trauma)

	Grade	Injury description
I	Haematoma	Involving single portion of duodenum
	Laceration	Partical thickness, no perforation
II	Haematoma	Involving more than one portion
	Laceration	Disruption < 50% of circumference
III	Laceration	Disruption 50-75% of circumference of D2 Disruption 50-100% of circumferenceof D1, D3, D4
IV	Laceration	Disruption >75% of circumference of D2 Involving ampulla or distal common bile duct
V	Laceration	Massive disruption of duodenopancreatic complex
	Vascular	Devascularization of duodenum

D1: 1st portion; D2: 2nd portion; D3: 3rd portion; D4: 4th portion of duodenum

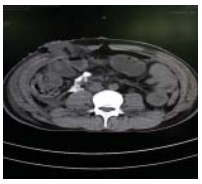

Figure 3 CT Abdomen with Oral contrast showing gunshot with duodenal leak (arrow)

Figure 4 CT Abdomen (coronal view). duodenal leak.

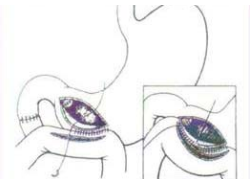

Figure 5 Pyloric exclusion

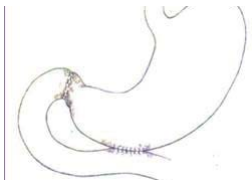

Figure 6 Pyloric exclusion

a high index of suspicion. A successful management requires an experienced surgical team, a specialized intensive care unit and a multidisciplinary team approach.[2] Several options are available. The choice of procedure depends on the site and degree of injury.

In pancreatic and duodenal injury, all ages are not exempt but most patients are young.[3] The vast majority of our cases (87%) followed blunt trauma from road traffic accidents. In countries with high rates of civilian violence the majority of the injuries follow penetrating trauma like stab and gunshot.

Our approach is to conserve whenever possible especially the spleen in children. Primary repair provides adequate surgical treatment for the majority of duodenal injuries.[4,5] Grades 1 and 2 injury can safely be treated conservatively. There is evidence in literature that a quicker and simpler pancreatoduodenal surgery is associated with better outcome in comparison to complex, prolonged and surgery.[6] Damage control surgery is an important and viable option in poor risk patients with multiple trauma. In the hemodynamic unstable patients, damage control surgery is necessary to control contamination by resection of the injured duodenum and pancreas head with stapling and adequate drainage of the bile duct and stomach.[2,7] Re-laparotomy should then be performed after obtaining physiologic control within 24-48 hours.

Management of combined pancreatic and duodenal injuries also depend on degree of damage and major pancreatic duct involvement.[8-10] Pancreatic duct injury occurs in about 15% of the patients, mostly from penetrating trauma.[11-13] If not recognized and treated early, duct disruption is almost always fatal due to pancreatitis and sepsis.[14-15] Hence drainage and lavage is an important part of pancreatic injury management.[16-17] Management range from conservative to resection and reconstruction. It includes primary duodenal injury repair and pancreatic drainage, duodenal exclusion and pancreatic drainage to distal pancreatectomy and Whipple's procedure.[17-18] ERCP and stent insertion may be necessary in pancreatic fistula. Pancreaticoduodenectomy (Whipple's procedure) is a formidable procedure when undertaken for severe pancreaticoduodenal injury.[18] Patients requiring Whipple's procedure most often need a damage control procedure initially, than staged procedure is advocated.[1,6] It is rarely carried out and has a mortality exceeding 30% in emergency situations.[18-19]

Conclusion:
Familiarity with complex surgical procedure and reconstruction is key to a successful management of duodenal and pancreatic injury. We still recommend adequate exploration of the pancreas and duodenum and conservative operative management where possible.

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Role and contribution of authors:

Dr Yasser Hussein, collected the data and references and wrote the initial writeup

Dr Dauda Bawa, collected the data, references and helped in introduction and discussion writing

Dr Sultan Al-Amri, critically review the article and made the changes in discussion and conclusion

Dr Fawzy Nasser, went through the article and made changes in introduction and discussion

Dr Saeed Abdallah Al-Ghamdi, critically review the article and made changes in introduction, discussion and conclusion

Dr Saleem Abdul Sattar, critically review the article and made necessary changes.

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