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CASE REPORT

COMPLETE PANCREATIC TRANSECTION FOLLOWING BLUNT ABDOMINAL TRAUMA: CASE REPORT

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A B S T R A C T

Complete transection of the pancreas following a blunt abdominal trauma is rare, and the diagnoses can be missed easily because of the retroperitoneal position of the pancreas. We were presented with this rare case of 31 years old Saudi lady who was kicked in her abdomen by one of her relatives and this caused complete transection of the pancreas. This was augmented by the fact that she had spinal surgery for her kyphosis 20 years ago. She had distal pancreatectomy, but her post-operative period took six stormy weeks. We are presenting the literature review for this type of rare injury and its management.

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INTRODUCTION

Pancreatic injuries are not common injuries and account for up to 10% of all major trauma cases with nearly 25% of these injuries result from blunt injuries [1]. The delay in presentation and diagnosis in milder form is attributed to its protected retroperitoneal site. The prognosis is affected by the delay in diagnosis, and even with use of modern CT scan, these injuries can be missed in the early hours. High index of suspicion is needed for prompt diagnosis since even the serum amylase is not sensitive or specific. CT with contrast remain the best tool for diagnoses and in our case because of the severity of the injury where the pancreas was completely transected it was easily picked. These types of injuries can be managed both surgical and non-surgical according to the grade of the injury, however both modalities are accompanied with various complications among which are Haemorrhage, development of pseudocyst, and pancreatic fistula.

Case Report

A 31 years old Saudi female was presented to our accident and Emergency department with central abdominal pain following sustained a blunt trauma, (a kick), by one of her relatives in her abdomen two days ago. The pain was severe, associated with nausea and vomiting and aggravated by lying down flat, and relieved by sitting up. The lady was under psychiatric treatment for schizophrenia, for which she was taking haloperidol 1.5mg.

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She also had Spinal surgery, for her kyphosis 20 years ago where it was fixed with internal metal rods. There were no other symptoms, no urinary, bowel or gynaecological problems. On Examination, she was in pain, otherwise conscious and alert. Her pulse was 120 / min, Blood pressure was 116/69, temperature was 36.9 ^{o} and her oxygen saturation was 96% on air. Her FAST scan in the A&E showed fluid in the Morrison pouch. Her blood works showed she had a Hb of 9.1, WCC of 19.2, total Bilirubin of 6.7 of which the direct was 4.1. Her serum amylase was 842 and her serum lipase was 3841. She had an immediate CT scan of her abdomen with contrast which revealed complete transection of the body of the Pancreas with 6.7 x 5 cm retroperitoneal haematoma causing pressure on the splenic vein (fig 1). She also had a large amount of hemoperitoneum collected in the pelvis, para-colic gutter, peri-splenic, Morrison pouch and the subphrenic region. Other injures included laceration in the left lobe of the liver.

Following fluid resuscitation, she was taken to the operating theatre where subtotal pancreatectomy and splenectomy was done. Her post-operative period was very stormy, and she was brought back to the operating room twice in two separate occasions, for control of bleeding. Drains were left in the Pancreatic beds for three weeks, and removed just prior to discharge. This created a controlled pancreatico-cutaneous fistula, which closed spontaneously in week four. Patient was discharged home in week six.

DISCUSSION

Pancreatic injury following blunt abdominal trauma is rare [1,2,3,7] with incidence of 0.2% – 5%, and carries a morbidity

of 30-40% and mortality of 9-34% [2,4,5]. Penetrating trauma like gunshot and stab wounds on the other hand are commoner and carry an incidence of 20-30% [5]. The early mortality is usually due to associated to vascular injury while delayed mortality is due to sepsis and multi-organ failure [2].

Adult Pancreas is about 15-20 cm long, 1-1.5 cm thick and weighs about 90 -100 g [5]. The main pancreatic duct (MPD) of Wirsung traverses the entire length of the gland. The blood supply of the head is from the superior and inferior pancreaticoduodenal artery, while the neck, body and tail are supplied by the pancreatic branches of the splenic artery. The proximity of the Pancreas to Inferior Vena Cava (IVC), Portal vein and Aorta makes management of pancreatic injuries very difficult because of risk of exsanguinating haemorrhage.

The pancreas is relatively protected by its retroperitoneal location, however sudden localised force e.g as in our case a kick, or a steering wheel or in the case of children, a bicycle handlebar, will compress the pancreas against the vertebral column (fig 2 & 3)[5,1]. In our case the magnitude of the damage was exacerbated by the presence of the metal rod, which provided a relative sharp edge abutting on the posterior part of the body of the pancreas. In addition to this the patient claimed that she was kneeling on the wardrobe at the time of the injury, a fact which would have added a rebound force from the back, as explained by Newton law of mechanics," for every action there is an equal and opposite reaction".

The commonest part of the pancreas to be injured is the body, which was consistent with our case, followed by the head then the tail. 90% will involve another abdominal organ, and 60% will involve the duodenum. [5]. Though elevated serum amylase and lipase are neither sensitive nor specific [1,5,6] specially in the first 24 hours of the injury, the triad of upper abdominal pain, leucocytosis and elevated serum amylase following blunt abdominal trauma should alert to pancreatic injury [5]. Early Symptoms are mild epigastric pain, this is due to the retro-peritoneal location of the organ and a a defence mechanism by which the pancreas transiently decreases its secretion there by limiting pancreatic inflammation and edema [8]. Our lady did have the complete triad of pain, leucocytosis and elevated serum amylase and lipase, which fitted with the scenario of pancreatic injury , and this was confirmed by the CT scan. Elevated peritoneal amylase in peritoneal lavage (DPL) is more sensitive, but this test is used less frequently nowadays with the advent of modern CT scanners. Other source of raised serum amylase in trauma include trauma to the salivary gland, duodenum, liver, head and face [1,5].

There are several classification of Pancreatic injuries, like modified Lucas classification [1] , however the commonest used one is the American Association for the Surgery of Trauma Organ Injury Scale (AAST) (table 1) [2,3,6] (fig 4)

Table 1

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

Contrast CT is the most reliable method or diagnosis pancreatic injury [3,6] and has sensitivity and specificity as high as 90%. It can show inter pancreatic laceration, complete transection, enhanced pancreas with unenhanced haematoma, presence of peri-pancreatic fluid [6] fat stranding, fluid between splenic vein and pancreas [5]. However, 20-40% of CT scans might be normal if performed within 12 hours after the trauma. Pancreatic contusion on CT will appear as focal or diffuse low attenuation, while laceration appear as linear hypodense line perpendicular to the long axis, pancreatic fracture on the other hand will appear as a clear separation of fragments [5] A CT grading of pancreatic injury has been devised (table 2).

Table 2

Grade	Description
Grade A	Pancreatitis or superficial laceration (<50% pancreatic thickness
Grade B1	Deep laceration (>50% pancreatic thickness) of the pancreatic tail
Grade B2	Transection of pancreatic tail
Grade C1	Deep laceration of the pancreatic head
Grade C2	Transection of the pancreatic head

Endoscopic retrograde pancreatography (ERP) provides detailed images of the pancreatic duct, however, it is an invasive technique requiring patient cooperation and conscious sedation which is hard to achieve in trauma patient [7]. Alternatively, Intraoperative ERCP is an invaluable tool in the overall management of pancreatic trauma, it can show the extent of the duct injury or stenosis and can aid with stenting. MRCP on the other in a hemodynamically stable patient can give a rapid, non-invasive and accurate depiction of the pancreatic duct, but the disadvantage is that it does not allow for therapeutic intervention such as stent placement [7], however, its diagnostic sensitivity is increased when combined with Dynamic secretin stimulation (DSS) [5]. Ultra Sound is good for follow up of complication like pseudocyst. Plain XR is non-specific, however, it can show foreign bodies in penetrating wounds like bullet fragment, pulmonary parenchymal injury, gastric dilatation and pneumoperitoneum [5]. Widening of the duodenal sweep and "colon cut off" signs, sentinel loop of the duodenum are among other signs that can be seen on plain XR.

The management of pancreatic injury depends on the integrity of the MPD, extent of the pancreatic parenchymal damage, anatomical location, stability of the patient and degree of associated organ damage [6,7]. Grade I and II injuries are treated conservatively or by simple drainage, while grad III and IV require resection or possible whippel procedure [7]. The stump following distal pancreatectomy can be hand sewn after ligation the duct or use a mesh or omental patch. Occasionally, a Roux en Y is indicated following distal resection to prevent pancreatic fistula and pseudocyst [6] .A more conservative approach in distal injury would be abstention of resection of distal pancreas and performing a pancreaticoenterostomy or pancreaticogastrostomy [8]. Incomplete disruption of the MPD or disruption without obstruction can be managed by pancreatic duct stenting. For complete transection of the body, a distal pancreatojejunostomy and closure of proximal end is the procedure of choice [1]. Pancreatic head injuries on the other hand can be managed by external drainage if there is no devitalization and duodenum and ampulla are intact.

In the event of major trauma involving pancreatic injury, the best outcome is by applying the concept of damage control

where stomach, jejunum, and pancreatic stump are closed and bile duct ligated and reconstruction is performed after 48 hours when the patient is stable [8]. Children should be managed as much as possible by conservation of the pancreas, and those who develop pseudocyst as a complication can be treated external drainage [7].

Among patients treated by surgery for pancreatic trauma, complication are found in 20-40 %. Complications include [8]:

1. Pancreatic fistula
2. Bile leak
3. Intraperitoneal abscesses
4. Anastomotic dehiscence
5. Haemorrhage
6. Pseudocyst
7. Hemorrhagic pancreatitis
8. Diabetes Mellitus
9. Steatorrhea

In Conclusion, pancreatic injuries following blunt abdominal trauma is uncommon, but carries high morbidity and mortality. CT with contrast is the investigation of choice and the management depends on the grade of the injury.

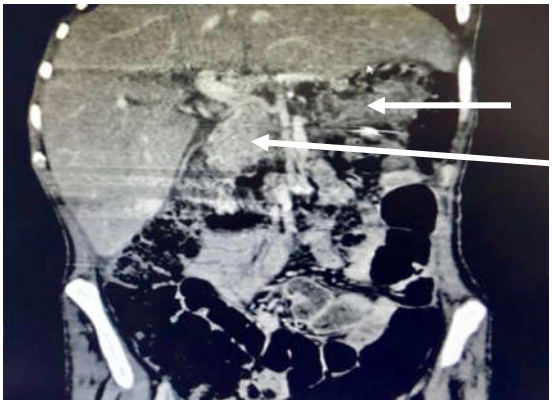

Fig 1

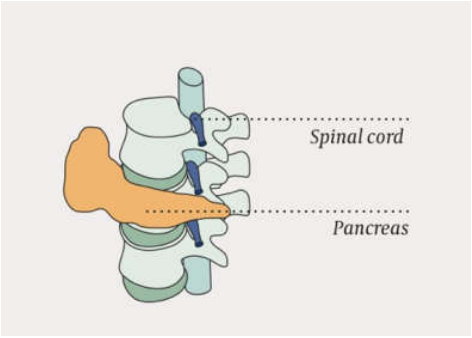

Fig 2

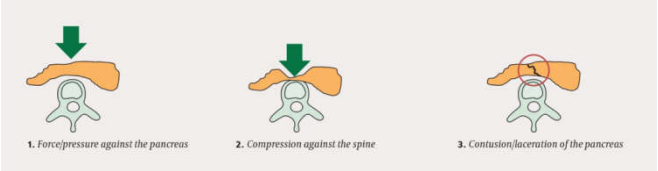

Fig 3

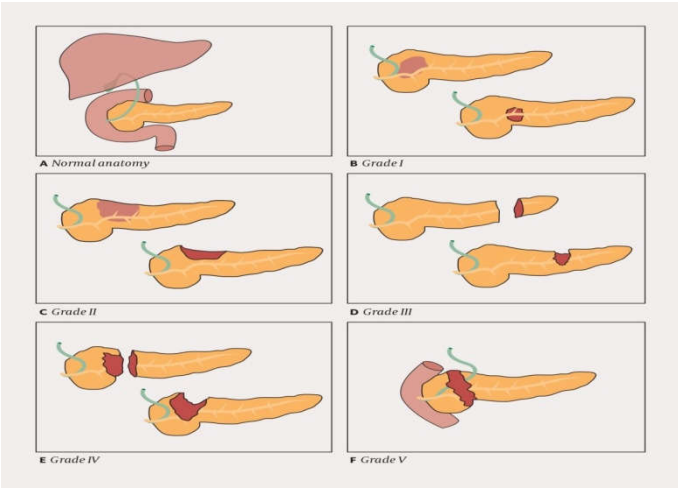

Fig 4

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