

“Spleen preserving distal Pancreatectomy for Pancreatic trauma. “A case report- with review of literature”.

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Abstract: *Spleen preserving distal pancreatectomy is a well accepted procedure for benign tumors of distal pancreas due to its safety and feasibility. Currently, there are not many reports in the literature to validate feasibility and safety of the procedure in trauma. Here in we report a case of distal pancreatic trauma where we managed to preserve the spleen during distal pancreatectomy in an emergency procedure.*

I. Introduction

Distal Pancreatectomy for major pancreatic trauma has traditionally involved removal of the spleen as an integral part of the procedure. The main advantage of removing the spleen during a distal pancreatectomy are the ease of performing this procedure and the shortened operating time. However, in the hemodynamically stable patient with an isolated pancreatic injury, splenic salvage should be considered. Splenic salvage is preferable because it eliminates the rare but potentially fatal complication of overwhelming infection with encapsulated bacterial organisms¹.

II. Case Report:

Suresh 18 year old male student admitted as Road traffic accident case with complaint of pain left hypochondrium and umbilical region of abdomen since accident i.e. 2 hours. Examination detected tenderness at left hypochondrium, epigastrium and lumbar region along with presence of pallor. Investigations revealed Haemoglobin -8 gm %, total leucocyte count 12000 cells/cmm and rest other investigations were within normal range. Patient managed conservatively. CECT abdomen done next day detected transection of pancreas. Patient was operated next day and a midline laparotomy performed revealed haemoperitoneum of about 800 ml; contusions were present near duodenum, splenic flexure, descending colon, mesentery and splenic hilum. Pancreas was completely transected at Junction of proximal one third and distal two third of body.

Pancreatic duct identified in proximal segment closed by interrupted sutures and subsequently divided proximal segment of body of pancreas closed by interrupted sutures. Distal transected pancreatic segment was lifted from retroperitoneum meticulously after making control of all vascular interconnections, keeping in view maintaining integrity of splenic vasculature. Post operative period was uneventful, repeat contrast CTscan done on 12th postoperative day revealed normal left over pancreas and spleen.

III. Discussion:

Even in the modern trauma center, pancreatic trauma remains a source of significant morbidity and mortality². Blunt trauma to the pancreas and duodenum is usually the result of a direct blow to the upper abdomen caused by assault, pedestrian road traffic accidents or deceleration of the torso against an unyielding surface or steering wheel, as in an unrestrained driver or passenger without seat belts^{3,4,5}. Blunt midline upper abdominal trauma results in posterior compression of the anterior abdominal wall against the spine, with injury to the intervening pancreas overlying or to the left of the portal vein and superior mesenteric vessels⁴.

Delay in diagnosis and intervention is the most important cause of increased morbidity and mortality. The retroperitoneal position of the pancreas contributes to delay in diagnosis, as clinical signs may be subtle and late in onset. Blunt trauma to the pancreas may be clinically occult, and parenchymal and duct injury may go unrecognized during initial evaluation. Awareness of this factor and recognition of the mechanism of injury should therefore lead to a high index of suspicion for pancreatic injury. On plain abdominal radiograph gas bubbles in retroperitoneum, adjacent to right Psoas muscle, around the kidneys or anterior to the upper lumbar vertebrae seen on frontal or cross table radiographs may indicate a duodenal injury⁶. Fractures of the transverse process of lumbar vertebrae are collateral evidence of significant retroperitoneal trauma. Other indirect signs of pancreatic injury are displacement of the stomach or transverse colon, or a general “ground glass” appearance⁶. However, ultrasound has proved to be an effective and reliable imaging technique for assessing abdominal trauma patient, but evaluation of pancreatic trauma is frequently difficult owing to associated abdominal injuries, overlying bowel gas, obesity or subcutaneous emphysema^{7, 8}. The main indications for CT are in haemodynamically stable patients with abdominal pain or tenderness following trauma who have a suspected pancreatic injury, and in assessment of late complications of pancreatic trauma.

Unless the two edges of a fracture or transected pancreas are separated by low attenuation fluid or haematoma, the diagnosis of pancreatic transection may be difficult on CT².

MRCP is a valuable additional imaging modality providing a non-invasive, accurate and rapid means of assessing the pancreatic duct. MRCP sequences depict the fluid filled pancreatic and bile ducts as high signal structures without the use of any contrast material, avoiding the risks of ERCP-related complications⁹.

The initial management of the patient with pancreatic trauma is similar to that of any patient with severe abdominal injury^{4,5}. The mechanism and type of injury are established while physical examination and resuscitation are in progress. In patients with blunt abdominal trauma, information should be sought regarding the mechanism of injury and the vector of force (eg steering wheel, bicycle or motorcycle handle bar, sports injury or assault). The injury may seem trivial or innocuous and the initial assessment may be misleading with scant clinical signs because of the retroperitoneal location of the pancreas.

In most patients the diagnosis of pancreatic injury is made at laparotomy. Gross inspection and palpation of the pancreas alone can be misleading as retroperitoneal or subcapsular haematoma and peripancreatic odema may mask major parenchymal and duct injuries⁵. Clues suggesting the presence of a pancreatic injury include a lesser sac fluid collection, retroperitoneal bile-staining, or crepitus or haematoma overlying the pancreas at the base of the transverse mesocolon or visible through the gastrohepatic ligament. Fat necrosis of the omentum or retroperitoneum may be present if there has been undue delay before laparotomy³.

Injury to the neck, body or tail of the pancreas with major lacerations or transections and associated pancreatic duct injury is best treated by distal pancreatectomy. Optimal management of the divided pancreatic duct and the resection margin after distal pancreatectomy remain controversial. Some surgeons have advocated the use of a Roux-en-Y pancreatojejunostomy to incorporate and drain the resection margin to prevent the development of a pancreatic fistula^{4,5}. However, in multiple trauma, the added risk of anastomotic leak is not warranted and this procedure is therefore not recommended¹⁰. A visible pancreatic duct at the resection margin should rather be ligated with a transfixing suture. Oversewing or stapling the resected end of the pancreas and using simple methods to buttress or seal the cut margin are sufficient, and have not led to increased fistula formation¹⁰.

In a case of transection of the pancreas to the left of the mesenteric vessels, a distal pancreatectomy should be performed^{11,12}. Ideally, an attempt at splenic salvage should be considered, but this is not often feasible in multiple injury patients. Spleen preservation during distal pancreatectomy was described in the

1940's by French surgeon Mallet-Guy³. Recognition of the immunological and hematological functions of the spleen and the risk of overwhelming sepsis in splenectomized patients has led to the concept of splenic preservation. A review of the English literature available revealed very few instances of this procedure having been performed for pancreatic trauma^{14,15,16,17}.

Since our patient was hemodynamically stable with an isolated pancreatic injury, so splenic salvage was considered. First, the splenic artery and vein exposed and isolated with umbilical tapes. The transection of the pancreas was completed with division of the remaining parenchyma near lower border. Next, with cephalad retraction of the splenic vessels and caudal retraction of the pancreatic specimen, multiple small branches between these structures are exposed. After ligation and division of all the branches, the body and tail of the pancreas removed with salvage of the spleen¹². Postoperative period was unremarkable and a repeat contrast CT scan done on 12th Post operative day revealed normal left over pancreas and spleen.

concern for the possibility of post splenectomy sepsis has prompted several authors to describe distal pancreatectomy without splenectomy¹⁸. The technical challenge in pancreatectomy with splenic salvage is in isolating and ligating the pancreatic branch vessels off the splenic vein and artery yet preventing injury to the splenic hilum and thrombosis of the splenic vein. Generous mobilization of the entire pancreatic gland and spleen is a prerequisite. An average of 22 tributaries of the splenic vein and eight branches of the splenic artery must be ligated¹⁹. Patton and colleagues reported splenic salvage in almost two-third of trauma patients (64%) who underwent distal pancreatic resection²⁰.

The increased operative time and potential blood loss incurred while performing pancreatectomy without splenectomy must be balanced against the slight risk of overwhelming post splenectomy sepsis. The balance would seem to favor splenic salvage only when the patient is completely hemodynamically stable and normothermic and the pancreatic injury is isolated or present with only minor associated injuries. Hence, more and more splenic salvage should be performed in such selected trauma patients.

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