

## CASE REPORT

# Combined Surgical Management of Ruptured Splenic Artery Pseudoaneurysm with Pancreatic-Duct Stricture in Complex Polytrauma Patient

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### ABSTRACT

**Objective** Pancreatic stricture in trauma or chronic pancreatitis leads to increased intraductal pressure and localised leak of pancreatic juices which causes pseudoaneurysm of splenic artery or other adjacent arteries. Simultaneous surgery for ruptured splenic artery pseudoaneurysm and drainage procedure for pancreatic duct stricture is not reported in literature. Attempts to classify peripancreatic pseudoaneurysm based on whether communication with pancreatic duct presents or absent, have been useful in selection of management strategy of this patient. Although embolization is first step in management of pseudoaneurysm but in a patient with dual pathology only splenic artery embolization alone is not a sufficient measure to cure. In such case the causative factor pancreatic duct stricture may lead to recurrence of bleed by similar mechanisms. **Case report** We hereby report lifesaving surgery done in a complex polytrauma patient for posttraumatic pancreatic duct stricture and ruptured splenic artery pseudoaneurysm - Excision of pseudoaneurysm with ligation of splenic artery with splenectomy and lateral pancreatico-jejunostomy were done in same operation. Postoperatively patient had uneventful course and remained symptom free for last 2.5 years of f/up. In past this patient underwent 4 surgeries after pancreatic trauma - laparotomy and necrosectomy for posttraumatic periancreatic necrosis (done outside), laparotomy and drainage with ileostomy, ileostomy closure (authors unit), arthroscopic fixation of cruciate ligaments of left knee joint. **Conclusion** Pancreatic duct strictures can lead to splenic artery pseudoaneurysm. In a hemodynamically stable, well evaluated patient, where localised pseudoaneurysm rupture is present along with pancreatic duct stricture, simultaneous surgery for pancreatic-duct drainage and pseudoaneurysm ligation can be safely done.

### INTRODUCTION

Pancreatic injuries which are conservatively treated may lead to pancreatic stricture in follow up. Posttraumatic pancreatic duct strictures can present similar to various complications of chronic pancreatitis. In such cases localized trauma of splenic artery at the time of primary trauma or gradual dissolution of arterial wall as a result of release of pancreatic juices from obstructed pancreatic duct may lead to development of following complications- pseudoaneurysm of splenic artery, pancreatico-jejunal fistula, pancreatico-gastric, pancreatico-colic fistula or chronic pseudocyst [1, 2, 3]. We hereby report a case of pancreatic trauma which was initially managed with laparotomy and drainage (done outside 5 yrs. back), which was subsequently reported in authors unit for multiple intraabdominal collections and sepsis after 10 days. On follow up after 2 yrs. after his first surgery he

developed PD stricture at neck of pancreas and ruptured splenic artery (SA) pseudoaneurysm. It was successfully managed with combined operation for ligation of SA and excision pseudoaneurysm + splenectomy with drainage of pancreatic duct (PD) with lateral pancreaticojejunostomy (LPJ) [4, 5]. Such cases need proper plan for bleeding control, as well as drainage of obstructed pancreatic duct. Combined management of such cases may consist of angiographic embolization or surgical ligation of aneurysm with either resection of distal pancreas or drainage of PD with LPJ. In world literature there few reports to suggest that management of pancreas via resection [2, 6] is indicated but there is no report in literature mentioning drainage procedure combined with pseudoaneurysm ligation, which makes this case unique.

### CASE REPORT

We Report that the Twenty-three-year-old male met accident with blunt abdominal trauma and complete dislocation of rt knee joint 5 yrs. back. Post trauma patient consulted a general surgeon (other hospital), a CECT abdomen done at that time showed pancreatic trauma grade 3 with periancreatic necrosis and collections. For this he was operated there - laparotomy and drainage was done (outside). Post operatively on day 10 patient developed multiple collections, gastric fistula via drain in left hypochondrium and sepsis with septic jaundice. He was referred to us for further management. We evaluated

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**Abbreviation** FJ feeding jejunostomy; LPJ lateral pancreaticojejunostomy; PD pancreatic-duct; SA splenic artery  
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with CECT abdomen which showed 400 cc collection in left perisplenic area with 300 cc collection in right retroperitoneal area and leakage of oral contrast via drain. So 2nd surgery was planned – findings were-400 cc pus near left perisplenic area with 300 cc pus at right retrocolec area with sloughed ileocecal junction and gastrocutaneous fistula at previous drain site. Surgery done was laparotomy and drainage of collections with diverting gastrostomy + closure of gastric fistula, Feeding jejunostomy (FJ) and resection of ileocecal junction and ileostomy. Postoperatively gastric juices were diverted via gastrostomy till gastric repair healed and nutrition was managed with FJ and TPN. After healing of all fistulas ileostomy closure was done after 6 months and arthroscopic fixation of cruciate ligaments was done after 7 months.

On follow up patient remained afebrile, 3 ultrasound done 6 months apart showed no collections. After 2.5 yrs. from initial events, he presented to us with c/o severe abdominal pain and tense cystic collection in left hypochondrium diagnosed outside as pseudocyst in ultrasound abdomen. Patient was admitted, he remained hemodynamically stable emergency CECT was done, which showed 20×20 cm size haemorrhagic collection near tail of pancreas with 3×3 cm size SA pseudoaneurysm. Patient underwent 5th surgery - 1000cc of clotted blood removed, resection of SA pseudoaneurysm with ligation of SA and splenectomy with LPJ extending from neck through body and tail of pancreas was done (Figures 1, 2, 3). Postoperatively drain fluid amylase was normal so drain removed on day 4, oral diet advanced on day 4. Patient was discharged on day 5. On follow up of 2.5 yrs. patient remained symptom free and there is no evidence of re-bleed.

## DISCUSSION

Pseudoaneurysm in any form of pancreatitis (acute/traumatic/chronic) is associated with different mechanisms. It can form due to intensive inflammatory process in the peripancreatic tissues secondary to the release of enzymes or due to initial trauma to vessel wall. The necrosis and infection destroys the vessel wall, leading to its perforation and life threatening haemorrhage in retroperitoneal, peritoneal spaces or GI tract [1, 2]. In cases of chronic pancreatitis due to any cause these peripancreatic focal changes may not be noticeable in imaging as these events can happen without causing gross changes typical in acute pancreatitis. Although embolization is the first line of management in stable patients, when expertise available. Surgery is reserved for failed embolization especially in unstable patients. Surgery is preferred over embolization when unsuitable vessel or lack of expertise for embolization and need for simultaneous drainage/respective operation is there as in our case [6]. In 2014 Pen *et al.* have given management based guidelines where they stated that "one should prefer embolization - if bleed is from a vessel which is 5 mm away from major vessels or from major vessel but can be sacrificed. One should prefer surgery if- patient is unstable or if there is communication with gut or in presence of pancreatic juices [2, 6]. This strategy has lead to less

mortality in small subset of patient in article published by Jun-Te-Hsu *et al.* in 2006, where they compared surgical vs. angiographic management of 9 such patients with bleeding from pseudoaneurysms [6]. Some authors have also stated that surgery can be performed in either an emergency setting for cataclysmic bleeding or in a planned manner if the patient manages to overcome the initial bleeding [4].

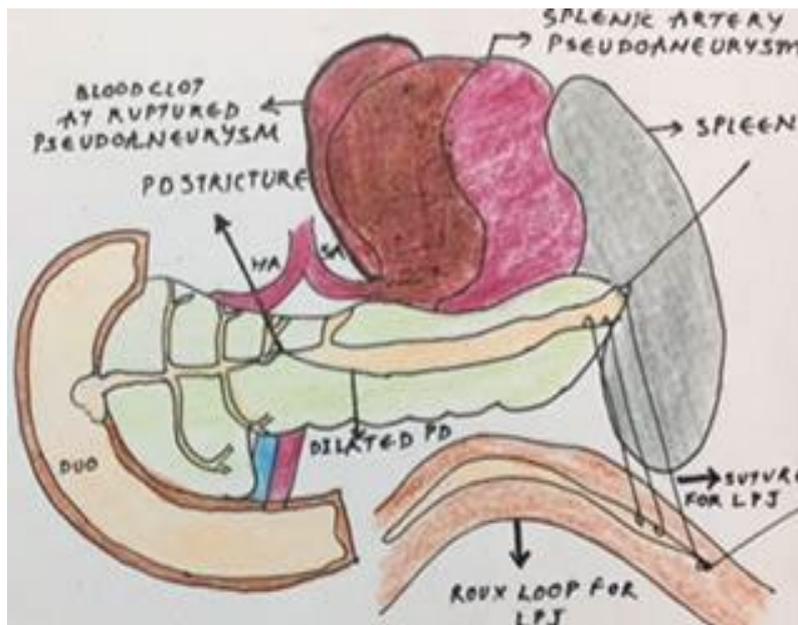
The success rates of angioembolization are varying from 80-100% even in expert hands. There can be failure in form of sac refilling in 25% of thrombin-based procedures, 25% of coil embolization and 33% of sandwich technique procedures [3]. Similarly endoscopic dilatation of PD strictures can be done especially in single dominant stricture in head of pancreas. When stricture is in neck of pancreas there is scarce literature which shows that it can be done. But when we see long term results its 60-70% success rate with multiple procedures needed for 1 patient along with no 10 yrs. follow up data available. In a young patient 10-20 yrs. results also affect his quality of life.



Figure 1. Dilated PD in body and tail of pancreas with perisplenic hemataoma and pseudoaneurys.



Figure 2. Pseudoaneurysm of Splenic artery with dilated PD in body and tail.



**Figure 3.** Diagram showing intraoperative appearance of bleeding pseudoaneurysm and starting steps of Roux-En-Y Lateral pancreaticojejunostomy.

The author wants to emphasize that instead of various non-invasive procedures like angioembolization along with endoscopic stricture dilatation in multiple sittings which have variable failure rates. For endoscopic dilatations strictures in neck are less suitable with overall 2 yr recurrence rates upto 38% [7, 8], so one should have curative surgical plan. Especially in a case of pseudoaneurysm which is well contained, patient is hemodynamically stable, who needs with simultaneous management of causative factor of pseudoaneurysm namely – PD stricture. Goal should be to combine both in one surgical plan and offer long term cure for both conditions in such patients.

We hereby present this rare case of combined surgical management of pseudoaneurysm with drainage of structured pancreatic duct which can offer near 100% cure of patient from bleeding pseudoaneurysm as well as from PD stricture. Regarding type of surgical procedure needed i.e., ligation of pseudoaneurysm only vs. distal pancreatectomy, location of vessel involved affects decision [4, 6]. When bleed is from pseudoaneurysm, if located in proximal part of the pancreas transfixing of the aneurysm from the cystic lumen with a subsequent drainage. If located in the distal part of the pancreas then distal pancreatectomy with cyst removal and splenectomy should be preferred [6]. In this case since pseudoaneurysm was located near body of pancreas combined drainage procedure was preferred [5].

In this case pseudoaneurysm was not present in initial presentation 5 yrs. ago, but developed later as a result of PD stricture in neck of pancreas and release of proteolytic enzymes. Since patient had contained bleed in peripancreatic area, he already underwent multiple surgeries leading to dense adhesions, stricture in PD was in neck so distal pancreatectomy could be more morbid and difficult operation and could have lead to diabetes in young patient of 25 yrs. age. As patient was stable it was possible to plan according to pathology and both pseudoaneurysm

bleed and PD stricture were dealt with simultaneously, following guidelines given in literature in few articles (2/6). Till now there are no such case report /series in literature which make this case unique for presentation.

### Conflict of Interest

The authors declare that they have no conflict of interest.

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