

Case Report

# Superior Mesenteric Artery Thrombosis; Rare complication after Pancreaticoduodenectomy

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## Abstract

Pancreaticoduodenectomy(PD) is the treatment of choice for malignant and some benign diseases of the pancreas and periampullary region. Common complications after PD include delayed gastric emptying, pancreatic fistula, anastomotic leak and intra abdominal collection. Postoperative medical complications include arrhythmia, renal failure, pulmonary complications, UTI and Deep vein thrombosis. Superior mesenteric artery (SMA) thrombosis is rarely been reported after PD. There is theoretical possibility of arterial thrombosis in patient with history of vascular disease, which may precipitate after postoperative hypovolemia. SMA thrombosis is difficult to diagnose in postoperative period due to nonspecific symptoms and associated with high mortality rate up to 80-90%. Our patient was a 68 years old female with lower end cholangiocarcinoma without any other co-morbidity. She underwent PD without any intraoperative complications. Post operatively she developed SMA thrombosis. Unfortunately patient could not be salvaged and she succumbs to death.

## Introduction

Pancreaticoduodenectomy(PD) is the treatment of choice for malignant lesions of the pancreas and periampullary region. PD consists of multi visceral dissection and associated with high morbidity. Common complications associated with this morbid procedure include delayed gastric emptying, pancreatic fistula, anastomotic leak and intra abdominal collection. Other medical complications include arrhythmia, renal failure, pulmonary complications, UTI and Deep vein thrombosis. Here we present a case of Superior mesenteric artery (SMA) thrombosis after PD done for Lower end cholangiocarcinoma, which has ever been reported in literature.

## Case Report

A 68 years old female presented with obstructive jaundice, anorexia and weight loss for 2 months. She was diagnosed with lower end cholangiocarcinoma. She had no other

comorbidity with ECOG1. Her serum bilirubin was 30mg/dl and CA19.9 level was 418.5. Preoperative imaging was consistent with cholangiocarcinoma without any evidence of vascular pathology. Preoperative biliary drainage was done and patient was optimized for surgery. She underwent classic PD with feeding jejunostomy. Intraoperatively, the lesion was well localized to periampullary region and there was no evidence of any vascular involvement. Patient tolerated the procedure well without any intraoperative complication.

Thromboprophylaxis was given in perioperative period with LMWH and pneumatic pump. She was started on enteral feeding by feeding jejunostomy on 4<sup>th</sup> POD, which she tolerated well. Her initial postoperative course was smooth, but she developed drowsiness on POD-8. Beside that she was haemo dynamically stable and her biochemical parameters were normal. In view of persistent drowsiness, neurological evaluation was done including CT

scan of head, which revealed no abnormality. On next day she became progressively unresponsive and developed abdominal distension. She had gastrointestinal bleed, which precipitate as malena and hemorrhagic aspirate from Nasogastric tube. CT abdomen was done which revealed SMA thrombosis without any evidence of bowel gangrene. In view of poor general condition, she was managed conservatively with anti-coagulative therapy. But patient progressively deteriorated and succumb to death within 24 hrs. We retrospectively evaluated for any predisposing factor for vascular thrombosis, but were unable to find any obvious cause for SMA thrombosis in this patient.

#### Discussion

Pancreaticoduodenectomy (PD) is recommended treatment for malignant diseases of periampullary region. In the past decades postoperative mortality rates upto 40% have been reported for this morbid procedure, but after improvement of technical and perioperative care, this has been reduced to less than 5% in high-volume centers. (1) Despite these advances, morbidity still remains high, with reported complication rate of 30% to 60%. The majority of perioperative complications after PD are not life threatening, though they result in prolonged hospital stay and readmissions. (2) The most common complication reported is delayed gastric emptying, seen in 30-35% cases. Other associated surgical complications are anastomotic failure, among which pancreaticoenteric anastomotic leak is most common followed by gastro-jejunostomy and choledoco/hepaticojejunostomy. Other nonsurgical complications in these patients consisted of cardiac complications like cardiac arrhythmias, pneumonia, hemorrhage and renal failure. Other reported complications after PD are pulmonary embolism, myocardial infarction and splanchnic vein thrombosis. (3)

Portal vein and superior mesenteric vein thrombosis has been reported after PD in literature. As increased experience with vascular resection and reconstruction during PD for borderline resectable tumors, there is an increasing trend toward these complications. SMA

thrombosis as a complication of PD, is rarely been reported in literature. Although there is theoretical risk of SMA thrombosis after SMA reconstruction, but there is paucity of data on this complication. Arterial thrombosis can be precipitated due to postoperative hypovolemia in patients with pre-existing atherosclerosis. Our patient underwent classical PD without any vascular intervention or intraoperative complication. Preoperatively patient was otherwise fit without any comorbidity and initial postoperative period was smooth. There was no evidence of any vascular disease including atherosclerosis in this patient.

SMA thrombosis is characterized by a high mortality rate. Although relatively less commonly seen in clinical practice, SMA thrombosis is the most common cause of acute mesenteric ischemia. Thrombosis in SMA most commonly occurs at the level of ostia and results in ischemia of the entire midgut, which consequently leads to infarction if left untreated. Prognosis of acute thrombotic ischemia is worse even after restoration of mesenteric blood supply (4).

Patients with SMA thrombosis share the common features associated with atherosclerotic disease such as hypertension, hyperlipidemia, diabetes and smoking. These patients often have a past history of other vascular event like myocardial infarction; stroke or peripheral vascular disease (5). Acute SMA thrombosis commonly occurs in a patient of chronic mesenteric ischemia and frequently precipitated by intravascular volume depletion from dehydration. This dehydration can occur after severe diarrhea or vomiting associated with gastrointestinal diseases, postoperative fluid losses and sepsis or due to third space fluid loss, such as acute pancreatitis. Clinical symptoms of SMA thrombosis are nonspecific, which can lead to delay in diagnosis. Patients often present with severe abdominal pain that is out of proportion to clinical finding. (6)

A high index of suspicion is required to diagnosis of SMA thrombosis. Angiography is considered as the "gold standard" for diagnosing mesenteric vascular occlusion.

But now a day's MDCT Angiography has become investigation of choice with high specificity. In a recent meta-analysis, MDCT Angiography had a sensitivity and specificity of 93.3% and 95.9% respectively (7). An aggressive approach to resuscitation and hemodynamic monitoring is strongly encouraged in these patients. Intra-arterial administration of thrombolytic agents has effectively restored mesenteric blood flow in selected patients when administered within hours of symptom onset. The goals of surgical therapy are to restore mesenteric blood flow, assess intestinal viability, and resect nonviable or necrotic intestine. Endarterectomy or ante grade bypass using a prosthetic conduit are the revascularization procedures of choice in the absence of enteric contamination. Endovascular treatments, such as thrombolysis, are generally avoided owing to the urgent need to restore intestinal perfusion and prevent intestinal infarction (8).

SMA thrombosis is associated with high mortality and earlier studies reported mortality rate up to 80-90%. Conservative treatment results in a mortality of 100% with rare exceptions. In patients treated with bowel resection, short term survival can be achieved in 49% of the cases. Despite advances in surgical and diagnostic management, literature reported a short-term mortality rate of 30-60% in patients undergoing revascularization of the SMA (9).

#### Conclusion

Pancreaticoduodenectomy is a morbid procedure and associated with some known complications. However, SMA thrombosis is a rare complication after PD. These patients often have unusual presentation, so investigations like CT abdomen are recommended earlier in case of any suspicion. SMA thrombosis is associated with high mortality and these patients are difficult to salvage.

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