

## Case Report

# Acute Celiac Trunk Thrombosis Treated with Open Thrombectomy

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**Abstract**

We present a case of a fifty-five year old male with acute thrombosis of the celiac trunk secondary to alcohol-induced pancreatitis. He was treated emergently with open thrombectomy and post-operatively has been maintained on oral anticoagulation. Although it is an uncommon abdominal emergency, acute thrombosis of the celiac axis carries a high risk of morbidity and mortality if not aggressively treated and should be included in the differential of any patient with a history of chronic pancreatitis that presents with sudden deterioration.

**Keywords**

- Thrombosis
- Celiac trunk
- Thrombectomy
- Acute pancreatitis
- Celiac axis

**ABBREVIATIONS**

**ERCP:** Endoscopic Retrograde Pancreaticocholangiography

**INTRODUCTION**

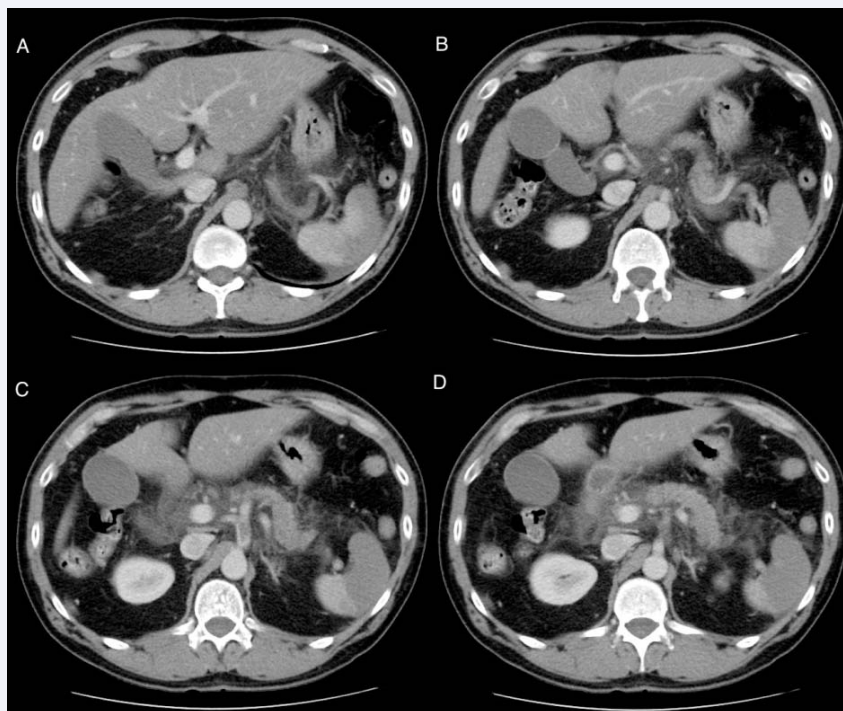
Acute thrombosis of the celiac trunk is an uncommon event, but carries a high mortality and morbidity when diagnoses and treatment are delayed [1]. Pancreatitis is an inflammatory process, well known for putting surrounding visceral vessels at risk for thrombosis. Pancreatitis secondary to an alcoholic etiology has been shown to have a higher propensity of such an acute thrombosis when compared to pancreatitis caused by gallstones, but nonetheless both are rare [1, 2]. Angiography is the gold standard for diagnoses and the goal of treatment is to reestablish blood flow to the mesentery via medical or surgical management [1]. We present a case involving acute occlusion of the celiac trunk secondary to acute alcoholic pancreatitis and a review of the current literature to determine the optimal standard of care for this pathology.

**CASE PRESENTATION**

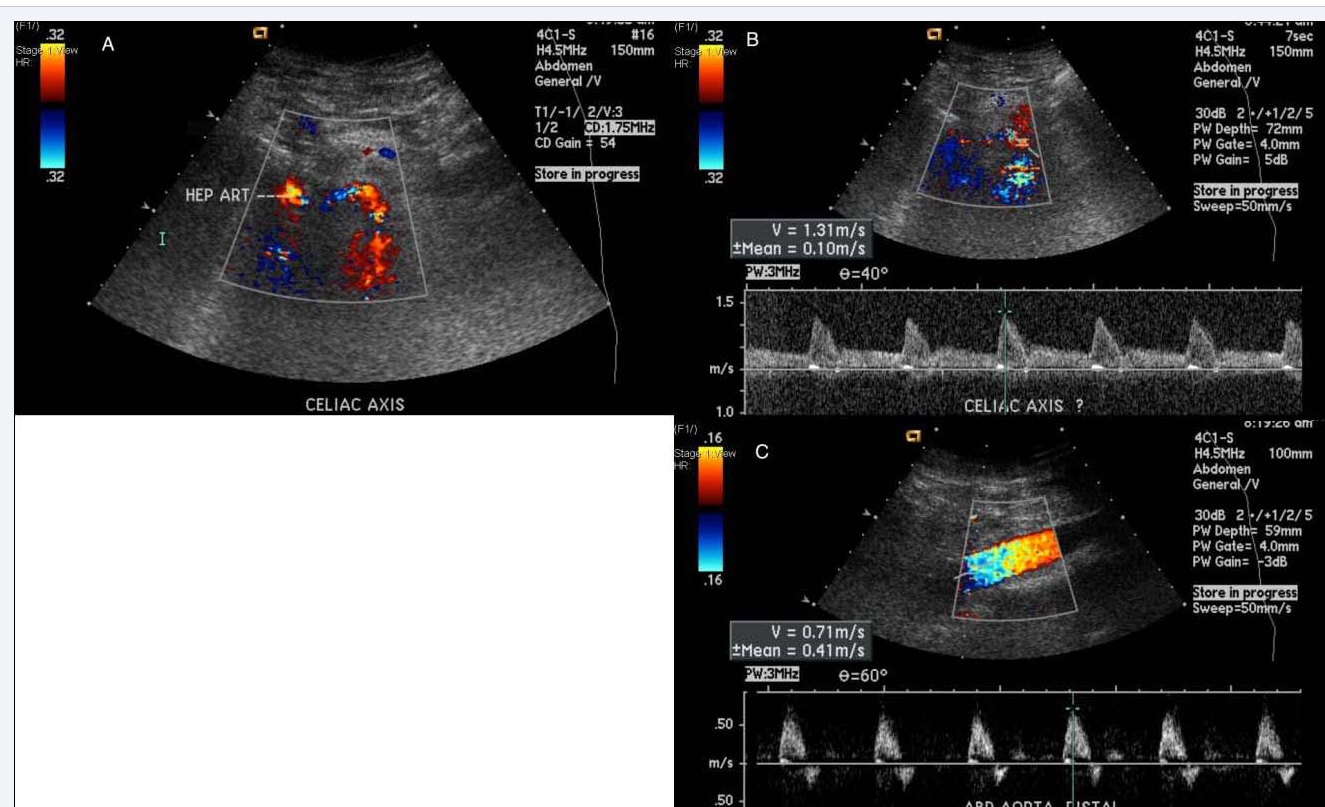
A fifty-five year old male presented to the Emergency Department (ED) complaining of new onset abdominal pain. He had a past medical history of anxiety, depression and chronic alcoholism. As per the patient, he admits to have been drinking heavily for the past six weeks. Abdominal exam done by the ED attending was significant for diffuse abdominal tenderness, but no peritoneal signs were appreciated on initial exam. Complete metabolic panel and lipase were significant for hypokalemia (2.9 mM/L), hypochloremia (88 mM/L), elevated AST/ALT (1432 U/L and 585 U/L respectively), and a lipase of 893 U/L. CT scan of the abdomen/pelvis with IV contrast was performed and showed

a filling defect within the celiac artery trunk extending to the common hepatic, left gastric and splenic artery; however the superior mesenteric artery was patent.

Figure 1 shows occlusion of the celiac axis including left gastric, common hepatic and splenic arteries. Vascular Surgery was consulted and by this time the patient had developed peritonitis. His CT scan results were discussed and given his change in clinical exam urgent surgery was recommended. The patient successfully underwent open thrombectomy of the celiac artery with extension into the splenic and proper hepatic arteries. Upon entry into the abdomen the liver appeared small and ischemic and significant pancreatic inflammation was appreciated. Arteriotomy was performed in the celiac trunk at the bifurcation of the common hepatic and splenic arteries. A #4 Fogarty catheter retrieved a large clot from within the celiac trunk. The Fogarty was passed three additional times, but no further clot was appreciated. Fresh, new clot was also retrieved from the hepatic artery while a more organized, chronic clot was removed from the splenic artery. A #8 feeding tube was introduced into these arteries and irrigated with heparinized saline and good back bleeding was present. The arteriotomy was repaired with 5-0 prolene sutures and intra-operative Doppler signals were present suggestive of good flow throughout the celiac trunk and its' branches. The liver did look ischemic, but had improved since the thrombectomy. Inspection of the bowel was unremarkable, with no signs of ischemia. Lower extremity pulses were present at the end of the case. The patient's post-operative course was complicated by alcohol withdrawal. After remaining in the hospital for five days, he was discharged on oral anticoagulation. The patient underwent mesenteric duplex studies at one-month follow-up and demonstrated patency of the celiac axis.



**Figure 1** A. (Top left): complete occlusion of the celiac trunk. B: (Top right): left gastric is partially occluded, common hepatic with extensive filling defect. C: (Bottom left): filling defect appreciated in all three branches, fat stranding present throughout liver and pancreas. D: (Bottom right): continued filling defect of the celiac trunk and its' branches. Again seen is fat stranding throughout pancreas and liver and flow heterogeneity throughout spleen.



**Figure 2** A: (Above): One month follow-up, Doppler color flow confirms patent hepatic artery and celiac trunk. B: (Top right): Adequate flow velocity is appreciated within the celiac trunk. C: (Right): Distal abdominal aorta with appreciable flow velocity.

## DISCUSSION

Although it is an uncommon abdominal emergency, acute mesenteric ischemia carries a high mortality. Thrombosis of the celiac arterial trunk is an uncommon etiology of acute mesenteric ischemia where diagnosis with immediate angiography and revascularization is life saving [1]. Multi-detector row CT arteriography (CTA) with accurate timing of contrast and 3D reconstruction can show extremely accurate images of the vessels for both acute and chronic mesenteric ischemia [3]. CTA studies are judged to be satisfactory up to second order branches of both the celiac and SMA [3]. Operative management for celiac trunk thrombosis remains the gold standard. This is traditionally achieved via surgical bypass, however, endovascular techniques have been further described [1]. Jens et al. performed aortohepatic bypass on a patient with celiac trunk thrombosis secondary to hypercoagulable state due to platelet receptor abnormalities and maintained on chronic anticoagulation [4]. However, Serck and Cogbill performed open thrombectomy and catheter-directed thrombolysis with little success in a celiac trunk thrombosis secondary to hypercoagulable state due to malignant colon adenocarcinoma [5].

The most common vascular complication of pancreatitis is splenic vein thrombosis. From the review of English literature, this is the fourth presented case of celiac trunk thrombosis in the setting of acute pancreatitis. This is the first article describing the utility of thrombectomy for celiac trunk arterial revascularization. Arleo et al. provided successful management to be followed and managed as an outpatient [6]. Challand et al. described necrosis of the stomach and spleen secondary to celiac trunk thrombosis. The patient underwent a total gastrectomy and splenectomy with Roux-en-Y reconstruction [8]. Kumaran et al. report a middle-aged Malaysian male who developed celiac trunk thrombosis secondary to gallstone pancreatitis. After a failed ERCP the patient was managed conservatively, but eventually underwent laparotomy, which revealed complete infarction of the stomach and patchy necrosis of the pancreas and left lobe of the liver. He also underwent total gastrectomy, pancreatic and hepatic debridement followed by placement of feeding jejunostomy with Roux-en-Y reconstruction [7].

It is important for the clinical exam to remain the major determinant in deciding which therapeutic approach to take. Volume resuscitation and correction of acidosis are also of paramount importance [3]. Our patient developed an acute abdomen with overt peritonitis and therefore we elected to go to the operating room. Verdonk et al. describe a case of celiac trunk thrombosis secondary to metastatic testicular cancer. The patient developed abdominal pain, but not peritonitis and he was successfully treated with systemic anticoagulation [9].

Endovascular interventions show promise, but more studies need to be undertaken.

## CONCLUSIONS

Arterial thrombosis should be included in the differential of any patient with a history of chronic pancreatitis that presents with sudden deterioration [2]. Celiac trunk thrombosis carries a high risk of morbidity and mortality if not quickly treated. Our patient successfully made a full recovery aided in part to early presentation and access to appropriate providers. Multiple factors are involved in determining appropriate management of an acute ischemic event, however surgical intervention remains the definitive treatment modality if the patient develops an acute abdomen with peritonitis. Otherwise, it has been safely shown that systemic anticoagulation combined with endovascular can be successful in the appropriate patient population. Our case proves the importance of having a high index of suspicion for vascular injury in the patient with a history of multiple episodes of pancreatitis.

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### Cite this article

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