

## Surgical Treatment of Acute Occlusion of Mesenteric Artery

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### Abstract

**Background:** Acute mesenteric ischemia accounts for 0.1% of emergency hospitalizations but has a very high morbidity and mortality. Diagnosis needs to be fast to initiate treatment and to avoid diffuse bowel necrosis. Availability of CT scans in most emergency hospitals now days is of enormous help for clinicians to identify this condition. At our best knowledge, bowel revascularization has not been performed in Albania and surgery for acute bowel ischemia has been limited to bowel resection. We report a successful case treated with revascularization by us more than 6 years ago.

**Case report:** A 71 years old male presented for acute limb ischemia but the disease had begun two days before with intermittent abdominal pain and limb numbness. There was no clinical emergency so the patient was anticoagulated and

a CT scan was planned for the next morning. Immediately after such examination the patient experienced intense abdominal pain and the CT resulted with occlusion of the origin of Superior Mesenteric Artery. Surgical thrombectomy was performed within three hours. The bowel had no sign of necrosis but a small mesenteric hematoma obviated a limited resection. Direct bowel reconstruction was performed. The patient recovered completely.

**Conclusion:** A careful anamnesis is perhaps a better tool for diagnosis of acute mesenteric ischemia. A CT scan is better than time consuming observation in emergency ward. Mesenteric thrombectomy is feasible, easy to perform and very effective to prevent massive bowel necrosis.

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## INTRODUCTION

Acute mesenteric ischemia accounts for 0.1% of emergency hospitalizations but has a very high morbidity and mortality. (1, 2, 3) Diagnosis needs to be fast to avert treatment and to avoid diffuse bowel necrosis. Availability of CT scans in most emergency hospitals now days is of enormous help for clinicians to identify this condition. At our best knowledge, bowel revascularization has not been performed in Albania and surgery for acute bowel ischemia has been limited to bowel resection. We report a successful case treated with revascularization by us more than 6 years ago.

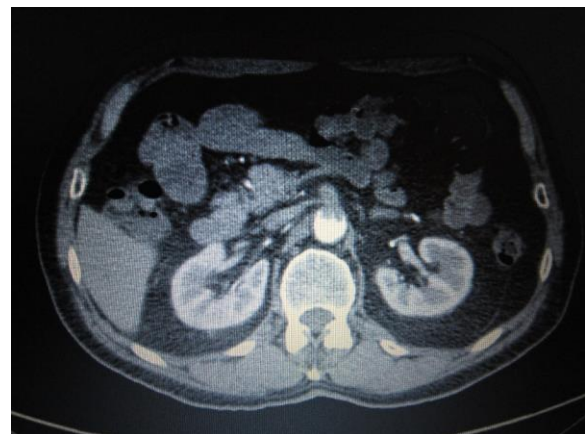
The medical history, diagnose, surgical treatment and outcome are reported.

## CASE REPORT

S.K., a 71 years old male, was hospitalized on 10 April 2012 for acute right leg ischemia. Two days earlier the patient had been at regional hospital emergency for a sudden acute abdominal pain associated with numbness and coolness of the right foot. His complains had resolved after symptomatic medication and he was sent home. The next evening the right leg pain recurred and he was referred at our service. He had experienced some vomiting on the way to hospital but at admission his abdominal and leg pain had vanished again. There were no distal pulses on his right leg and no pathological sign on physical abdominal examination. Doppler examination showed sufficient flow on the foot which excluded critical leg ischemia.

The patient was in sinus rhythm. He was taking Amiodarone for arrhythmia but no antiplatelet or anticoagulant. Our first diagnosis was embolization of right popliteal artery with possible micro-embolization in mesenteric artery territory. Anticoagulation with intra venous Heparin was administered. Routine blood count and biochemical analyses were normal. CT angiography of abdominal aorta and its branches was planned for the next morning since the clinical situation presented no emergency. The night passed eventless but the next morning, on return from the CT examination the patient experienced intense abdominal pain associated with nausea. A non occlusive parietal thrombus in abdominal aorta occluding the origin of the superior mesenteric artery (Fig. 1) and also an occlusion of the right popliteal artery were evident on CT.

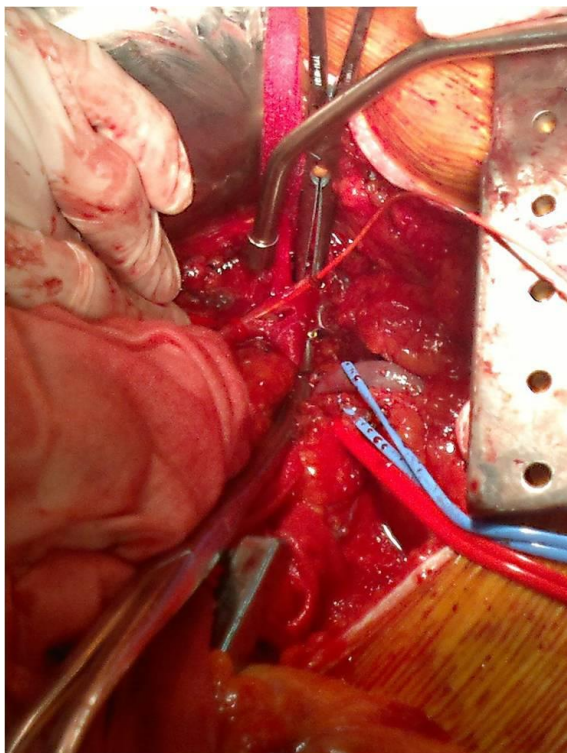
**Figure 1** CT scan showing thrombus in aorta and SMA origin



Surgical intervention was carried on within 3 hours. We performed median laparotomy under general anesthesia. There was cyanotic

discoloration of ileum and the majority of jejunum with only the first jejunum loops being pink. A little clear and odorless fluid was found in abdomen. Exploration continued through Mattox maneuver in order to insure good control of supra-renal aorta and superior mesenteric artery (SMA). After aorta was clamped we performed thrombectomy with Nr 4 Fogarty catheter through a transverse aortotomy at the level of SMA origin (Fig. 2).

**Figure 2** Operation view: exposure, aortotomy and Fogarty catheter during thrombectomy



Aortotomy was closed with running Polypropylene suture. Bowel resumed normal color, but hematoma developed in a triangular segment of mesentery corresponding to one ileum loop (fig. 3). The decision of the consultant general surgeon was for resection of

that loop with primary bowel anastomosis because of bowel perfusion impairment possibility. The laparotomy was closed after thorough rinsing of peritoneal cavity and drains left in place. A standard Fogarty thrombectomy of the right popliteal artery was performed through a femoral approach.

**Figure 3** Mesenteric hematoma



The patient was put at bowel rest. Treatment continued with intravenous Heparin in treatment doses, antibiotics and perfusions to maintain hydration.

No major event happened in the post operative period. Intestinal transit was restored on the 4<sup>th</sup> post operative day. ALP, GGT and LDH levels got higher the first 10 days and began to lower thereafter. Amylase, Lipase and PCR had the higher levels the first day and a lowering curve continuously.

The patient had diarrhea for two weeks. PCR, hepatic and pancreatic enzymes got normal within two months. Acenocoumarol was given for continuous anticoagulation. 9 months later the patient presented an incision hernia which

was surgically repaired. He had no other medical event for 6 and half years. He died from a stroke on August 2018.

## DISCUSSION

A high index of suspicion is the cornerstone for timely diagnose of acute mesenteric ischemia. Sudden intense abdominal pain with few to no physical signs is the clue to diagnosis. Other symptoms like bowel voiding (nausea, vomiting and diarrhea) and blood in the stools are present in less than half the cases (2, 3, 4). An associated embolic event or possible source should alert the surgeon (4, 5). Our patient history was very suggestive since he had an acute abdominal pain and another embolic event, the leg ischemia. Further more his history of treatment with Amiodarone suggested atrial fibrillation as a possible embolic source although he had sinus rhythm at presentation. Self limiting and intermittent abdominal pain would suggest micro embolization with no clinically important mesenteric involvement, so conservative treatment with Heparin and rehydration was reasonably instituted. The intense abdominal pain and nausea immediately after CT scan examination was “a lucky” circumstance for the patient. His disease was photographed before the signs appeared.

Based on the gradual evolving of the situation in three consecutive days and the location of thrombus partially occluding the aortic lumen and the origin of superior mesenteric artery we may speculate that the thrombus was located in

the aortic wall at first, and lately moved in a lower position occluding the SMA origin. The abdominal pain experienced on the previous days might have been related to a partial occlusion of the SMA. Part of this thrombus seems to have logged in the popliteal artery.

The view of thrombus and the lack of atherosclerotic signs on CT examination made clear the embolic etiology. Emboli are the cause of mesenteric ischemia in up to 30% of cases. In recent literature more than 50% are “in situ” thrombosis due to atherosclerotic lesions of the SMA (3, 86).

Endovascular treatment is recommended for early mesenteric ischemia especially for “in situ” thrombosis and partial or distal emboli although with a high rate secondary of surgical exploration (2, 3, 5, 7). Local thrombolysis, angioplasty and stenting or mechanical thrombectomy are possible endovascular methods. Hybrid procedures with distal thrombectomy and retrograde stenting of ostial stenotic lesion is another method used for atherosclerotic disease of SMA. Different bypass procedures are frequently used in atherosclerotic induced acute thrombosis. However, according to recent guidelines of American Gastroenterological Association the standard treatment for major SMA emboli remains surgical embolectomy. Thrombolytic agents have been used with some success in case reports and small series (7, 8). Surgical thrombectomy was the only treatment available to us.

The normal surgical technique for SMA thrombectomy is much simpler than what we used. SMA is exposed at the base of transverse mesocolon and abdominal aorta needs not to be exposed, but we had to remove also the parietal thrombus on the aorta. This situation made it necessary to us to expose the supra-renal aorta and to perform thrombectomy through aortotomy.

Damage of fragile small mesenteric branches from Fogarty catheter was the cause of mesenteric hematoma. This could be prevented by use of smaller catheters (Nr 2 or 3) and a more gentle technique. Perhaps no resection with a “second look surgery” in case suspicion for bowel necrosis might had been a better choice, however bowel resection is expected at some extent in most cases of arterial mesenteric ischemia. The extended post operative diarrhea and enzymatic imbalances at our opinion were linked to the exposure approach we chose and possible related pancreatic trauma.

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**Conflict of Interest Disclosure:** None declared.

## REFERENCES

1. Stoney RJ, Cunningham CG. Acute mesenteric ischemia. *Surgery* 1993;114:489-490.
2. Roussel A, Castier Y, Nuzzo A, Pellenc Q, Sibert A, Panis Y et al. Revascularization of acute mesenteric ischemia after creation of a dedicated multidisciplinary center. *J Vasc Sur* 2015;62(5):1251-6.
3. Corcos O, Castier Y, Sibert A. Effects of a Multimodal Management Strategy for Acute Mesenteric Ischemia on Survival and Intestinal Failure. *Clinical Gastroenterology and Hepatology* 2012;11(2):158-165.
4. Carver TW, Vora RS, Taneja A. Mesenteric ischemia. *Crit Care Clin* 2016;32:155-71.
5. Park WM, Gloviczki P, Cherry KJ Jr, Hallet JW Jr, Bower TC, Panneton JM, et al. Contemporary management of acute mesenteric ischemia: Factors associated with survival. *J Vasc Surg* 2002;35:445-52.
6. Ryer EJ, Kalra M, Oderich GS, Duncan AA, Gloviczki P, Cha S, Bower TC. Revascularization for acute mesenteric ischemia. *J Vasc Surg* 2012;55(6):1682-1689.
7. Brandt LJ, Boley SJ. AGA technical review on intestinal ischemia. *Gastroenterology* 2000;118 (5):954-968.
8. Bala M, Kashuk J, Moore EE, Kluger Y, Biffl W, Gomes CA, et al. Acute mesenteric ischemia: guidelines of the World Society of Emergency Surgery. *World Journal of Emergency Surgery* 2017;12:38.