

# GI Symposium 2020

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## **Acute Mesenteric Ischemia:**

*A rare but deadly complication*

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# Case Presentation



RC is a 77 yo male with h/o CHF (AICD placement), chronic Afib (on Eliquis), with ongoing tobacco use.

- Has had multiple orthopedic surgeries with revision of right TKA 1 week prior to admission.
  - Eliquis was held for 3 days prior to surgery and had not been restarted yet.

Presented to ER with sudden onset of severe diffuse, cramping abdominal pain, N/V and dark stools (heme + only).

- Found to be in Afib with RVR and hypertensive urgency.

# Case presentation (cont)



Initial evaluation showed:

- T 100.8, P 129, R 18, BP 160/100, 88% saturation on RA
- PE: revealed mild diffuse abdominal tenderness without guarding
- Labs: WBC 13.3, Hg 13.2, BUN 20/Cr 1.1, normal LFTs, Lactic acid 2.2
- CT abd/pelvis: distended bladder, diverticulosis, aortic calcifications, no acute process

Hospital course: Became febrile with progressive hypotension and worsening abdominal pain.

- Started on multiple vasopressors, broad spectrum antibiotics.
- Amiodarone drip for Afib/RVR.
- Intubated for respiratory failure.
- Physical exam remained relatively benign.

# Case presentation (cont)



Repeat CT abd/pelvis: 75% stenosis of celiac axis with acute SMA thrombus with diffuse small bowel distension.

- Surgical and interventional radiology consults urgently obtained.

SMA thrombolysis performed urgently with catheter directed TPA given and maintained on heparin infusion overnight.

- Follow up arteriogram showed improved flow to SMA distribution next day.

# Case presentation (cont)



Despite apparent reperfusion, clinical condition worsened over.

- Progressive sepsis, hypotension and distended abdomen.
- Repeat CT: diffuse SB ileus with pneumatosis, portal venous gas and diffuse mesenteric edema.

Patient had cardiac arrest ~48 hours following thrombolysis and was made DNR and **passed away** shortly after.

# Overview of intestinal ischemia



Intestinal ischemia can be caused by any process that reduces blood flow.

- Arterial occlusion- thrombotic, embolic, trauma
- Venous occlusion - venous thrombosis, portal hypertension, hypercoaguable state, etc...
- Nonocclusive - due to vasospasm.

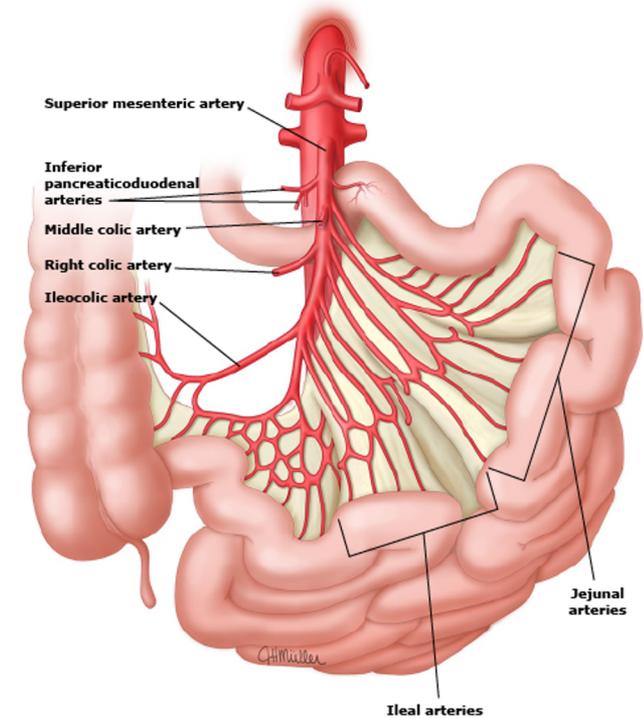
Classified according to time course of onset, degree of which blood flow is compromised and the segment of affected bowel.

- SB ischemia is referred to as mesenteric ischemia
- Large intestinal ischemia is referred to as colonic ischemia

# Blood Supply of the Upper GI



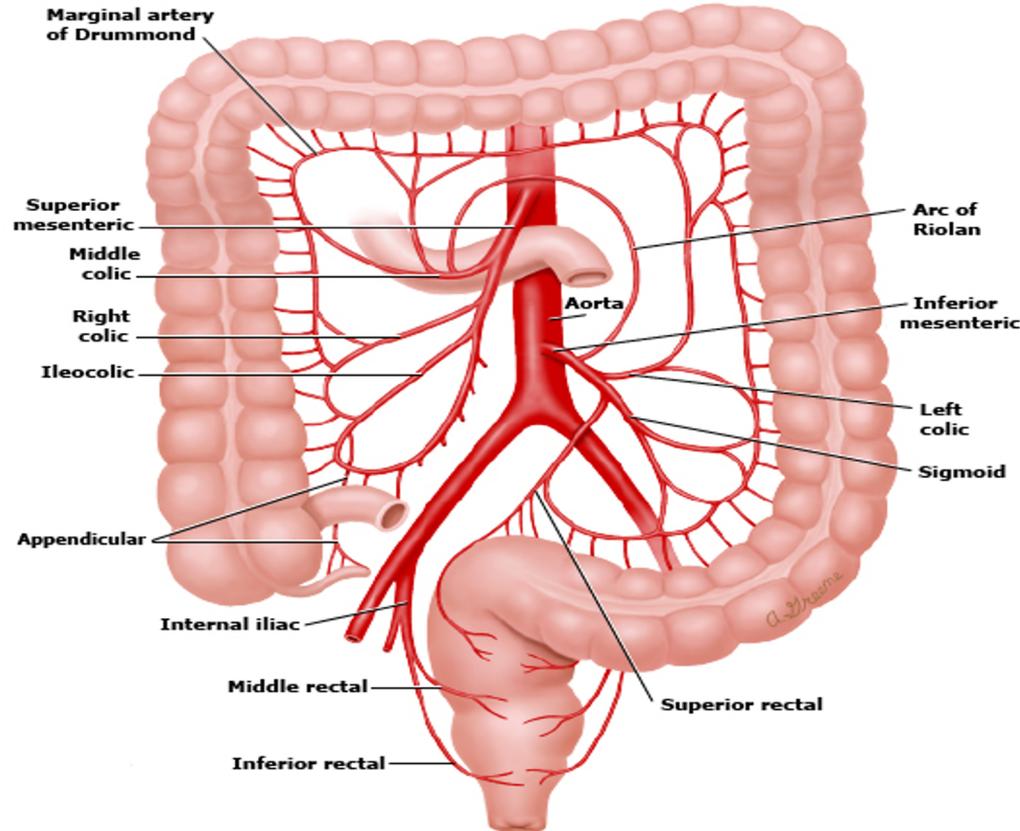
- Blood supply to the small and large bowel is derived from the celiac artery and SMA.
- The celiac axis primarily supplies the stomach, liver, spleen, pancreas and proximal duodenum.
- The SMA supplies the majority of small bowel and proximal colon.

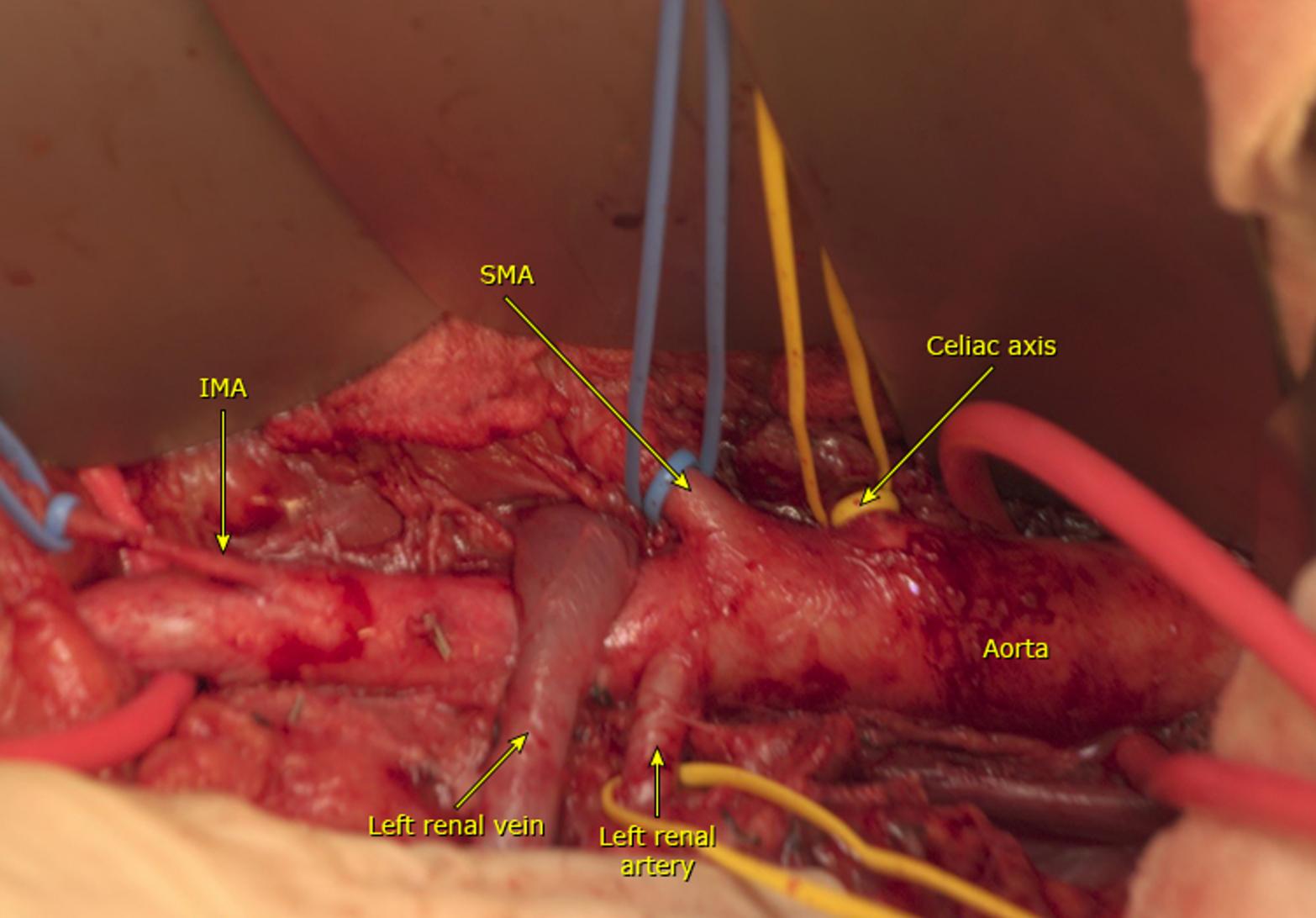


# Blood Supply of the colon



- Colon is supplied by the SMA and IMA and forms collateral supply with watershed areas at the splenic flexure and rectosigmoid regions







## Major etiologies:

- **Mesenteric arterial embolism (50%)**
  - Dislodged thrombus from LA/LV, valves, proximal aorta
- Mesenteric arterial thrombosis (15-25%)
  - Due to chronic intestinal ischemia from atherosclerotic disease, trauma, infection
- Mesenteric venous thrombosis (5%)
  - Hypercoagulable states, malignancy, prior abdominal surgeries
- Nonocclusive mesenteric ischemia due to hypoperfusion (20-30%)

# Risk Factors



- Advanced age (>50)
- Cardiac disease- arrhythmia (Afib), valvular disease, poor cardiac function
- Peripheral artery disease - atherosclerosis of the celiac trunk, SMA, IMA.
- Tobacco use
- Recent surgeries
- Acquired and hereditary thrombotic conditions - prior history of DVT, CVA, etc...

# Clinical Features



## History:

- prior embolic event, personal or FH of DVT/PE, prior symptoms of chronic mesenteric ischemia.

## Physical exam:

- May be initially normal or only show mild distention but will progress...

## Abdominal pain: “Out of proportion to physical exam”

- Sudden, severe, intense pain with N/V common in SMA occlusion.
- Tenderness in lower abdomen (LLQ commonly) with abrupt onset of rectal bleeding suggest colonic ischemia.

## Lab studies:

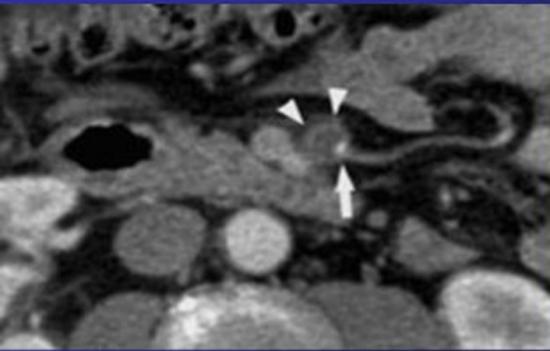
- Nonspecific but acidosis, elevated WBC, elevated Hct are all suggestive

# Diagnosis and Management

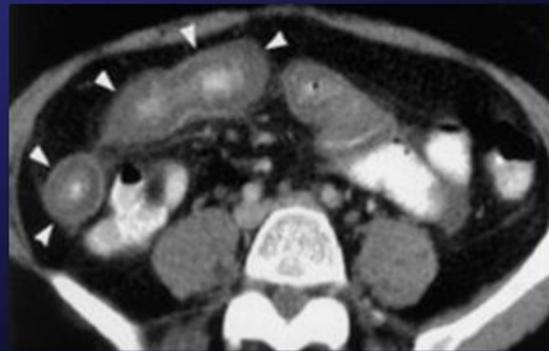


- Strong clinical suspicion in patients at risk.
- Plain radiography is nonspecific:
  - Distension of small bowel with wall thickening, pneumatosis intestinalis, free air
- CT is best for evaluation of abdominal pain.
  - CT angiography vs. direct angiography
- Initial management includes GI decompression, fluid resuscitation, hemodynamic monitoring, pain control, antibiotic therapy, anticoagulation.
- Requires multidisciplinary approach by GI, Radiology, Surgery, etc...

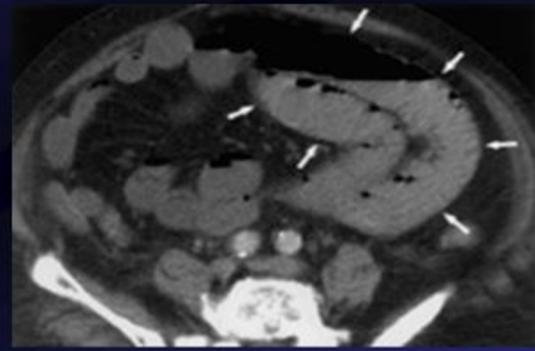
# Features on CT



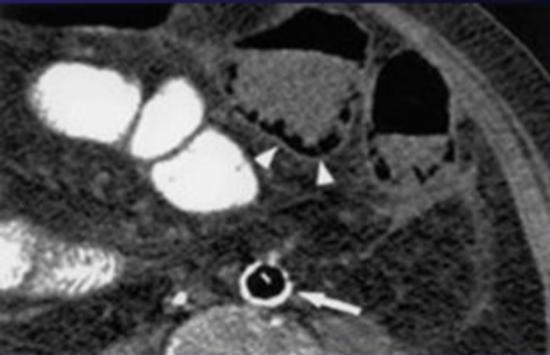
SMA thrombus



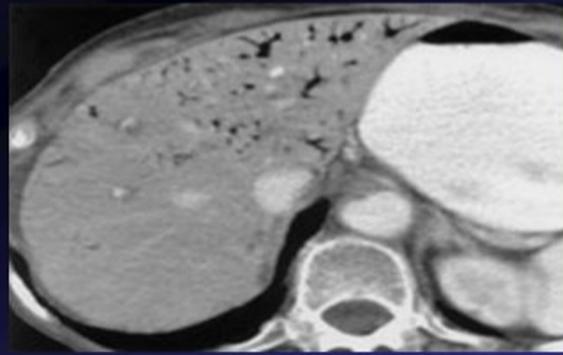
Bowel wall thickening



Non-enhanced bowel wall



Pneumatosis intestinalis



Portal venous gas

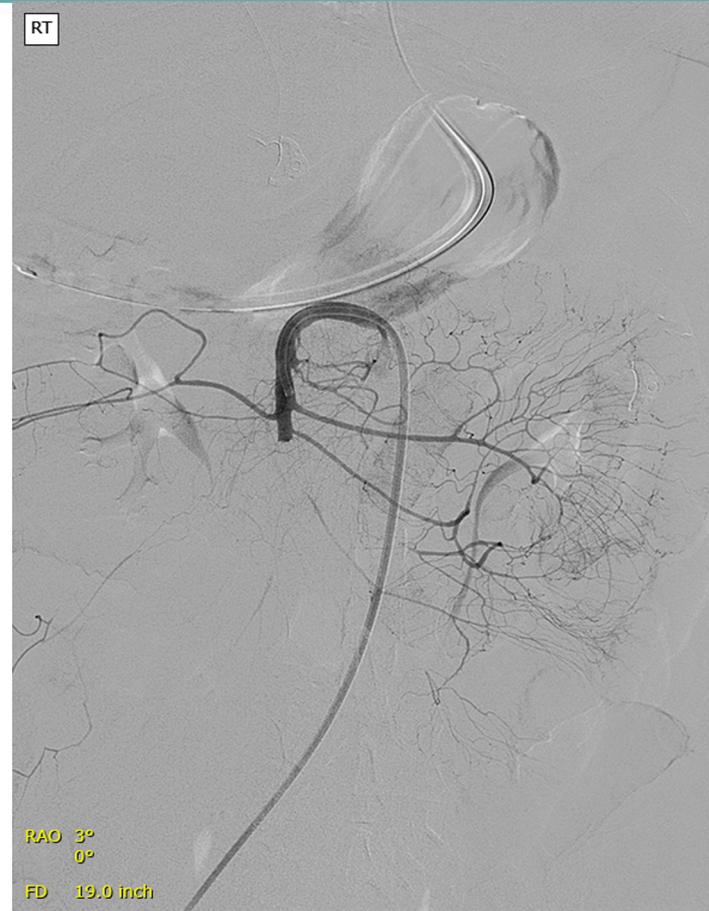


Fluid collection

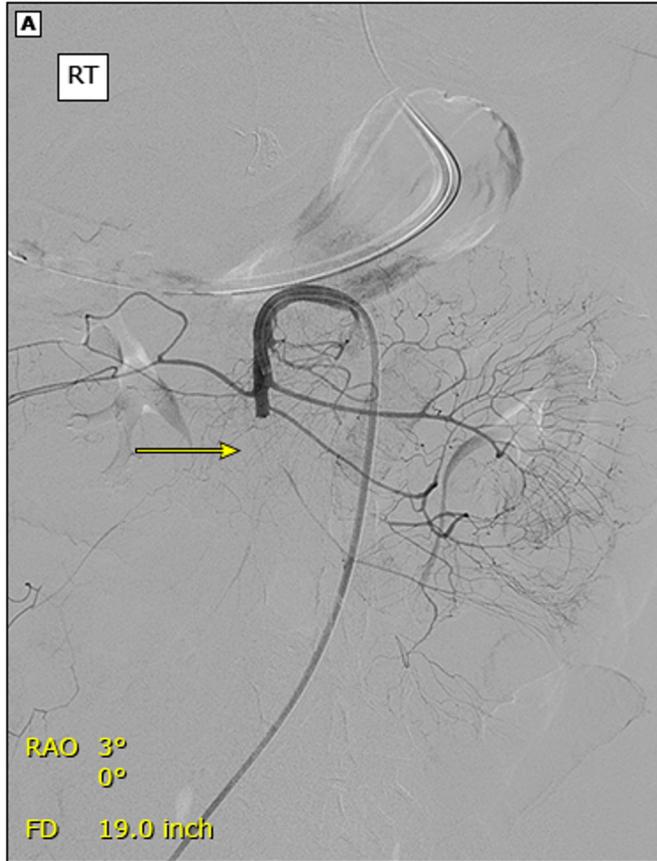
# Angiography



Catheter in SMA shows abrupt cut off due to embolism.



# Catheter directed thrombolysis



# Surgical Exploration



Required urgently if there are signs of perforation or emergent necrosis.

- Resection of any nonviable tissue for damage control.

Revascularization

- Embolectomy
- Mesenteric bypass

# Acute mesenteric ischemia

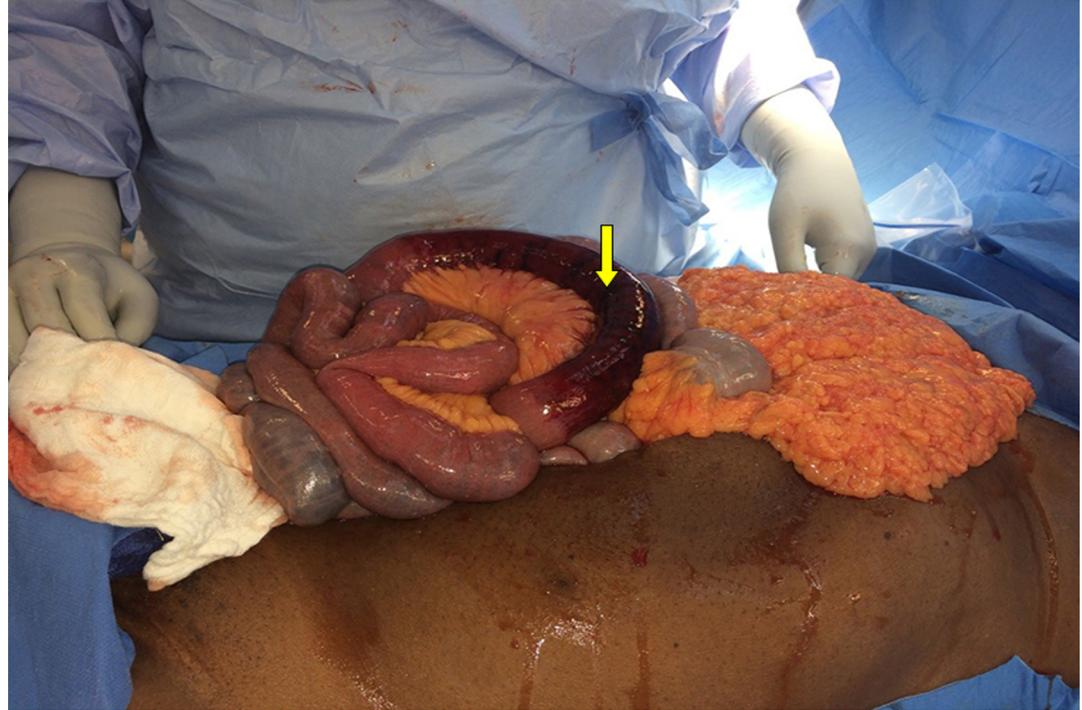


Holding jejunum (spared) while ileum is dusky and ischemic but still viable.

Due to acute SMA embolic occlusion.



# Necrotic bowel...



# Outcomes...



Survival is worse for arterial etiology vs. venous.

Acute mesenteric ischemia results in >60% mortality.

Early recognition is essential and must maintain a high clinical suspicion for patients that are at risk.

Swift multidisciplinary approach is imperative.

# References



G. Pearl and R. Gilani. Acute Mesenteric arterial occlusion. UpToDate. Waltham, MA: UpToDate Inc. <https://www.uptodate.com> (accessed on 01/03/2020).

D. Tendler and J. Lamont. Overview of intestinal ischemia in adults. UpToDate. Waltham, MA: UpToDate Inc. <https://www.uptodate.com> (accessed on 01/03/2020).