

ACUTE MESENTERIC ISCHEMIA (AMI)
2017 guidelines of the World Society of Emergency Surgery – 2022 update

- **Occlusive AMI**
 - **Arterial embolism** – previously 50% of cases, decreased to 25%
 - Afib
 - Poor ejection LV function
 - Endocarditis
 - Occasionally generated from an atherosclerotic aorta
 - **Arterial thrombosis** – 25% of cases, increased to 40% (many of these patients have a history consistent with chronic mesenteric ischemia including postprandial pain, weight loss, or “food fear.”
 - Pre-existing chronic atherosclerotic disease leading to stenosis
 - Vasculitis
 - Mesenteric dissection
 - Mycotic aneurysm

- **Non-occlusive AMI (NOMI)** – 20% of cases, increased to 25%
 - Usually due to vasoconstriction associated with low splanchnic blood flow
 - Typically in pts with decompensated heart failure associated with sepsis, hypovolemia and use of vasoconstrictive agents
 - The compromised SMA blood flow also affects the proximal colon due to involvement of the ileocolic artery

Mesenteric venous thrombosis (MVT) – less than 10% of cases

- Attributed to a combination of Virchow’s triad (stagnant blood flow, hypercoagulability, and endothelial damage)
 - Acute pancreatitis
 - Inflammatory bowel disease
 - Surgical trauma such as splenectomy or bariatric surgery
 - Underlying hypercoagulable state
 - Idiopathic in young patients, 36% of MVT occurs without an obvious cause

Clinical scenarios

- Severe abdominal pain out of proportion to physical examination findings should be assumed to be AMI until disproven.
- If the physical exam demonstrates signs of peritonitis, there is likely irreversible intestinal ischemia with bowel necrosis.
- Non-occlusive mesenteric ischemia (NOMI) should be suspected in critically ill patients with abdominal pain or distension requiring vasopressor support and evidence of multi-organ dysfunction.
- Unexplained abdominal distension or gastrointestinal bleeding may be the only signs of acute intestinal ischemia in NOMI and may be undetectable in sedated patients in the ICU.
- Patients surviving cardiopulmonary resuscitation who develop bacteremia and diarrhea (with or without abdominal pain) should be suspected of having NOMI. Right-sided abdominal pain

associated with the passage of maroon or bright red blood in the stool is highly suggestive of NOMI in these patients

Computed tomography angiography (CTA)

- Should be performed as soon as possible for any patient with suspicion for AMI despite the presence of renal failure
 - The consequences of delayed diagnosis, missed diagnosis, or mismanagement are far more detrimental to the kidneys and the patient than exposure to the contrast agent
- Findings suggesting irreversible ischemia
 - Combination of the following (especially the Combination all)
 - Intestinal loop dilatation and thickness
 - Reduction or absence of visceral enhancement
 - Pneumatosis intestinalis
 - Portal venous gas
 - Portal or mesenteric venous gas strongly suggests the presence of bowel infarction
 - Free intraperitoneal air
- Findings in NOMI
 - Bowel ischemia and free fluid in the face of patent mesenteric vessels
- Findings in MVT
 - Thrombus in the superior mesenteric vein on venous phase is the most common
 - Associated findings that suggest MVT include
 - Bowel wall thickening, pneumatosis, splenomegaly, and ascites
- The clinical significance of pneumatosis intestinalis as a single radiological finding remains challenging
 - In up to 60% of patients may be a benign finding
- Angiography can differentiate occlusive (embolic and thrombotic) from NOMI
- Oral contrast is not indicated and even harmful

General treatment

- IVF resuscitation should commence immediately to enhance visceral perfusion
- Nasogastric decompression
- Broad-spectrum antibiotics should be administered immediately. Intestinal ischemia leads to early loss of the mucosal barrier, which facilitates bacterial translocation
- Anticoagulated with intravenous unfractionated heparin unless contraindicated
 - Full dose anticoagulation should be initiated on all patients prior to the surgical procedure
 - It should be emphasized, however, that any evidence of bowel ischemia or infarction precludes the use of systemic thrombolytic therapy
- The finding of massive gut necrosis requires careful assessment of the patients underlying comorbidities and advanced directives in order to judge whether comfort carries the best treatment

Occlusive AMI treatment

- Endovascular revascularization procedures are the primary option in cases of arterial occlusion

- Percutaneous mechanical aspiration or thrombolysis
- Angioplasty, with or without stenting
 - Patients with CTA evidence of acute partial or complete occlusion of the SMA and without clinical or imaging evidence of advanced bowel ischemia.
- Prompt laparotomy should be done for patients with overt peritonitis
 - There is overwhelming evidence that peritonitis secondary to bowel necrosis mandates surgery without delay
 - The most important argument in favor of the early laparotomy approach is the ability to assess bowel viability directly and thereby, minimizing delays in restoring mesenteric blood flow.
- Damage control surgery is an important adjunct
 - Patients who require intestinal resection due to the necessity to reassess bowel viability
 - Refractory sepsis.
- Planned re-laparotomy is required after restoration of SMA flow, with or without resection of ischemic bowel (and no anastomosis or stoma) following resuscitation in the ICU
 - Most often, re-exploration should be accomplished within 48 h and decisions regarding anastomosis, stoma, or additional resection can be made with plans for sequential abdominal closure.

NOMI treatment

- Treat the underlying cause
- Improve mesenteric perfusion
- Infarcted bowel should be resected promptly

MVT treatment

- Continuous infusion of unfractionated heparin
- Patients with peritonitis require emergency surgery
- The first-line treatment for mesenteric venous thrombosis is anticoagulation. Systemic thrombolytic therapy is rarely indicated. When clinical signs demand operative intervention, one