Mesenteric Ischemia
A Deadly Miss

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KEYWORDS

• Mesenteric ischemia • Pain out of proportion • Time is bowel • Acute arterial emboli • Acute arterial thrombosis • Mesenteric venous thrombosis • Nonocclusive

KEY POINTS

- Mesenteric ischemia has a variety of etiologies, each with its own historical clues to assist in diagnosis.
- Early computed tomography angiography without waiting for administration of oral contrast should be pursued in suspected cases of mesenteric ischemia.
- Laboratory findings do not have sufficient sensitivity and specificity for ruling out or in the disease.
- Treatment requires surgery and interventional radiology consultation, intravenous antibiotics and fluids, and anticoagulation.

INTRODUCTION

Mesenteric ischemia is one of a few vascular abdominal catastrophes where rapid diagnosis and initiation of treatment are imperative to reduce long-term morbidity and prevent mortality. There are 4 major etiologies of acute mesenteric ischemia, namely, arterial embolus, arterial thrombosis, venous thrombosis, and nonocclusive, which are discussed in detail. The presentation of patients with mesenteric ischemia is usually nonspecific with a "benign" objective abdominal examination, which can provide a false sense of security because the late findings of this disease process (ie, absent bowel sounds, positive fecal occult blood test, focal or generalized peritonitis from visceral ischemia, elevated lactate, hypotension, fever) have not revealed

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themselves. In general, a high degree of clinical suspicion should be based on the combination of history, examination, laboratory results, and imaging studies to arrive to this diagnosis.

EPIDEMIOLOGY

Although a rare case of abdominal pain with an annual incidence of 0.09% to 0.2% per year and approximately 1% of acute abdomen hospitalizations,[1,2] this is offset with a 60% to 80% mortality within the first 24 hours.[3] With the ever-expanding geriatric population, this disease is expected to increase.

ANATOMY

The abdominal aorta gives off 3 major branches to the intestines, which are the celiac artery (CA), superior mesenteric artery (SMA), and inferior mesenteric artery.[4] The CA perfuses the foregut (distal esophagus to second portion of duodenum). Acute mesenteric ischemia of the foregut is very rare, because the CA is a short, wide artery with good collateral flow. The SMA perfuses the midgut (duodenum to distal transverse colon), which encompasses nearly the entire small bowel and two-thirds of the large bowel. This is the most common embolic site of mesenteric ischemia owing to a favorable take-off angle (approximately 45°) from the aorta. The inferior mesenteric artery perfuses the hindgut (transverse colon to rectum) and is rarely the sole vessel involved in mesenteric ischemia. Collateral circulation from the CA or inferior mesenteric artery generally allows sufficient perfusion in reduced SMA flow states, such as nonocclusive or thrombotic mesenteric ischemia.

PATHOPHYSIOLOGY

Beside the abdominal aortic anatomy, it is important to understand how the bowel layers are affected by mesenteric ischemia starting from the inner to most outer layer (mucosa, submucosa, muscularis, and serosa). With mesenteric ischemia early on, the furthest layer (mucosa) from the blood supply is the first to become ischemic and is the reason for extreme, visceral pain. However, because the outer structures (musclaris and serosa) have not become ischemic, there is minimal irritation of the parietal peritoneum when the examiner indents down against the serosa and the external layers of the bowel. Hence, there is pain "out of proportion" to examination early in the disease process, where there is no focal localization or peritonitis. Eventually, the muscularis and serosal layers become ischemic and infarct, leading to peritoneal irritation and guarding with rigidity. At this point, the pain is "in proportion" to the examination with development of peritonitis. It is also important to consider that, between the early and late presentations mentioned, there may be a deceptive pain-free interval of 3 to 6 hours caused by a decline in intramural pain receptors from hypoperfusion.

THE CLASSIC TYPES

Mesenteric ischemia can be classified as acute versus chronic or occlusive versus nonocclusive. The following are the major 4 etiologies of acute mesenteric ischemia[5]: Acute arterial emboli, acute arterial thrombosis, mesenteric venous thrombosis, and nonocclusive.

Acute Arterial Emboli

In the most frequent cause of mesenteric ischemia, accounting for 40% to 50% of cases, the embolus lodges in the SMA.[3] The proximal branches of the SMA (jejunal