Mesenteric Ischemia

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KEYWORDS

- Acute mesenteric ischemia • Chronic mesenteric ischemia • Arterial embolism
- Arterial thrombosis • Mesenteric venous thrombosis
- Nonocclusive mesenteric ischemia

KEY POINTS

- Mesenteric ischemia is an uncommon disease most often seen in the elderly and is classified as either acute or chronic.
- Mesenteric ischemia results from blood flow in the mesenteric circulation that inadequately meets metabolic demands of visceral organs and can lead to bowel wall necrosis.
- Vague symptoms, comorbid conditions, and diagnostic or management delays contribute to extremely high mortalities associated with mesenteric ischemia.
- Computed tomography angiography is the most accurate diagnostic tool for both types of mesenteric ischemia.
- Revascularization via endovascular therapy is the recommended treatment of symptomatic patients who have not yet developed bowel ischemia or necrosis.

INTRODUCTION

Mesenteric ischemia is an uncommon disease most often seen in the elderly.[1] This disease results from blood flow in the mesenteric circulation that inadequately meets metabolic demands of the visceral organs[2] and, if untreated, eventually leads to necrosis of the bowel wall.[3] Mesenteric ischemia is divided into 2 types: acute mesenteric ischemia (AMI) and chronic mesenteric ischemia (CMI).[3] AMI can be further subdivided into 4 different types: nonocclusive mesenteric ischemia, mesenteric venous thrombosis, arterial thrombosis, and arterial embolism,[1,4] depending on the mechanism of insufficient blood flow (**Fig. 1**).[5] When there is a delay in diagnosing CMI, acute-on-chronic mesenteric ischemia may ensue.[6] Regardless of the cause, early diagnosis of mesenteric ischemia is crucial to avert intestinal necrosis and death.

According to the literature, the mortality for AMI is extremely high,[5] ranging from 60% to 80%.[7] Vague symptoms associated with AMI can lead to delayed diagnosis

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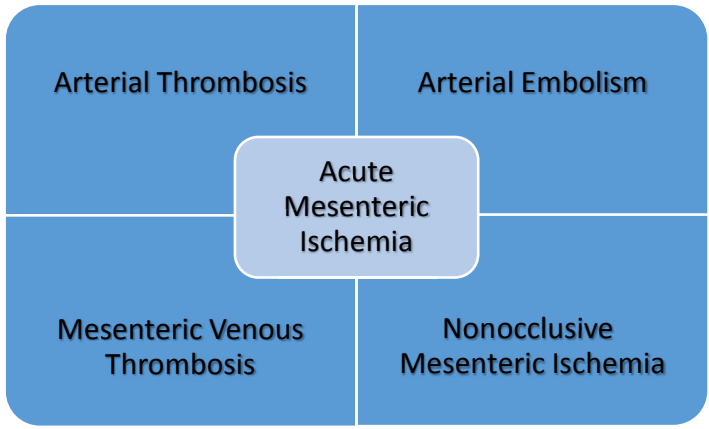

Fig. 1. Types of acute mesenteric ischemia.

and increased mortality.[4,8,9] Diagnostic and management challenges combined with patient comorbidities further contribute to the high mortality.[10] This article highlights recent advances in the early diagnosis and management of mesenteric ischemia that have been shown to be effective in decreasing morbidity and mortality.

PATHOPHYSIOLOGY

Three main arteries comprise the mesenteric circulation: the inferior mesenteric artery (IMA), the celiac trunk, and the superior mesenteric artery (SMA).[11] The celiac trunk predominantly delivers blood to the foregut (stomach and proximal duodenum).[11] The IMA delivers blood to the proximal anal canal, the rectum, the sigmoid and descending colon, and the hindgut (includes distal third of the transverse colon).[11] The SMA delivers blood to the transverse colon (proximal), the ascending colon, the cecum, the small intestine, and the midgut (includes distal duodenum).[11]

The mesenteric vessels are interconnected to adjacent areas by means of collateral vessels.[12] Typically, these vessels accommodate increased perfusion during the postprandial period in order to meet increased physiologic demand during digestion.[11] The ability of the collateral vessels to deliver sufficient blood flow to adjacent areas in times of acute occlusion varies and can be affected by the pattern of occlusion.[12] In acute total occlusion, the collaterals are usually not able to meet the physiologic demands of the gastrointestinal tract.[12,13] An acute single-vessel occlusion, which is usually of the SMA, can lead to profound ischemia very quickly as a result of decreased blood flow through this essential vessel and its collaterals. Because additional collaterals develop over time in CMI, symptoms usually do not develop until 2 or more primary vessels are totally occluded.[2]

ACUTE MESENTERIC ISCHEMIA

Causes

Mesenteric ischemia always occurs secondary to some other type of preexisting disease process.[12] AMI most frequently affects elderly individuals[4,14,15] with numerous atherosclerotic risk factors.[15] The most common causes of AMI are arterial thrombosis and embolism[4,9,16] within the SMA.[9] Nonocclusive mesenteric ischemia is not as common.[1,9] Venous thrombosis represents even fewer cases.[1] Each type of mesenteric