First Line of Defense: The Vital Role of Family Medicine Physicians in Preventing Acute Mesenteric Ischemia in High-Risk Patients

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# ABSTRACT

We present the case of a poorly-managed 70-year-old Caucasian woman with various comorbidities, presenting acutely to the ER with an atypical presentation and without any progressive symptoms. This patient was classified "very high risk", but despite a concerning clinical picture, had not been on any medications or monitored for any of her comorbidities. We highlight the essential and multifaceted role of primary care physicians in the prevention of bowel ischemia and recommend the use of routine outpatient monitoring, which along with a high index of suspicion, has clinical utility in preventing hospitalization, surgical interventions (bowel resection), and other serious sequelae of AMI. Timely detection, management, and specialist referrals from a family medicine physician can lower the overall burden on healthcare resources and personnel4

# **INTRODUCTION**

- → Acute mesenteric ischemia (AMI) is a life-threatening vascular emergency with an overall mortality of 60-80%, especially in "high-risk" population
- → AMI remains a diagnostic challenge despite pathophysiological understanding and modern treatment modalities
- → Various diagnostic challenges have led to a steady survival rate that has not improved in the last 70 years. This is owing to difficulty detecting AMI before bowel infarction ensues.
- → Bowel ischemia progresses to bowel necrosis and causes severe metabolic derangements leading to multiple organ dysfunction and death
- → Timely diagnosis and prompt therapeutic methods are essential for improved clinical outcomes
- → 50% survival when diagnosed within 24 hours of symptom onset as compared to <30% with delayed diagnosis</p>

### **CASE PRESENTATION**

70-year-old Caucasian woman presents with periumbilical abdominal pain and diffuse intermittent cramping for 6 hours. She <u>denies</u> post-parandial pain, aversion to meals, melena, hematochezia or any changes in bowel habits. A review of systems was negative. PMH was significant for CAD, DM, HTN, HLD, RA, Sjogren, CABG, silent MI, PVCs. FH is significant for stroke, Afib, RHD, and heavy tobacco use

#### Workup:

Trilium

- → PE revealed absence of rigidity, guarding and rebound tenderness
- → CBC significant for an elevated leuk count, ESR, glucose, PT, INR, pCO2 and troponin; and a decreased Ca, Albumin, and Lipase

Trigger

Hypovolemia Cardiac suroe

emodialysis

Low cardiac output syndrome

Early injury

Intestinal dysfunction



## DIAGNOSTIC CHALLENGES

Diagnostic challenges stem from the nonspecific nature of symptoms, the absence of a single definitive test, atypical presentations, and patient factors

- → Non-specific, subtle clinical presentations that have overlapping features with other GI pathologies such as pancreatitis, acute diverticulitis, small-bowel obstruction, acute cholecystitis
- → Gradual symptom onset may lead patients and healthcare providers to attribute the symptoms to chronic conditions rather than considering an acute vascular event
- → Atypical symptoms: older adults or individuals with compromised sensory perception may not experience severe abdominal pain
- → Patient factors: communication barriers, cognitive issues, or a lack of awareness about the significance of symptoms can impede the diagnostic process, especially in vulnerable populations
- → Physical exam does not differentiate between ischemic and infarcted bowel
- → Complications (ileus, peritonitis, pancreatitis, GI bleeding) mask initial signs and symptoms of AMI
- → No single definitive test for early disease stage: routine blood tests and imaging studies may not yet show definitive signs of mesenteric ischemia → Underlying Conditions: Patients with comorbidities such as cardiovascular disease, diabetes, or chronic kidney disease may already have symptoms that could be attributed to those conditions. Distinguishing between symptoms related to pre-existing conditions and those indicative of mesenteric ischemia can be challenging → Low clinical suspicion: Due to the rarity of acute mesenteric ischemia, clinicians may not always have it high on their list of differential diagnoses, leading to delayed or missed diagnosis



General signs	Stage		
	Early	Intermediate	Late
Mucosal hyperenhancement	$\checkmark$		
Target or Halo appearance	$\checkmark$		
Hyperattenuating wall (white pattern)	$\checkmark$	$\checkmark$	
Mural hypoenhancement (grey pattern)		$\checkmark$	$\checkmark$
Thickened bowel wall	$\checkmark$	$\checkmark$	
Paper thin wall			$\checkmark$
Gas pattern			$\checkmark$
Pneumoperitoneum			$\checkmark$



- → Multi-detector row computed tomographic angiography and mesenteric angiography is the current gold standard
- → Although computed tomographic angiography leads to an accurate diagnosis in many cases, early detection is a persistent problem
- → Because early diagnosis is vital to commence treatment, new diagnostic strategies are needed.
- → A <u>non-invasive simple biochemical test</u> is ideal to increase clinical suspicion of AMI and would improve patient selection for radiographic evaluation
- → final decision for management is made on the stage of the ABI with respect to the underlying pathophysiology, not the etiology (Table)
  - There is a correlation between pathologic staging and radiologic findings of ABI.
  - Reversibility-irreversibility of ABI spans a temporal continuum with areas of overlap
- → Experimental in vitro and in vivo studies show promise for <u>alpha glutathione S</u> <u>transferase and intestinal fatty acid</u> <u>binding protein</u> as markers for AMI
  ◆ Future research must confirm the clinical utility of these biochemical markers in the diagnosis of mesenteric ischemia







### **PRIMARY CARE**

- → Primary care is the first specialty that the patient encounters. PCPs are responsible for both delayed management and early survival of AMI.
- → To improve the outcomes of AMI, the first door to operation times need to be shortened.
- → Evidence suggests that patients fare better if they present directly to units with surgical expertise, instead of the ER (in cases of mismanagement and decreased monitoring)
- → The referral patterns need to be improved and all suspected AMI patients should find their way to units with multidisciplinary treatment at all times (radiology, surgery)
- → Future studies should try to identify simple clinical combinations of symptoms that could guide the triage and improve the outcome s