

A 67-year-old man is brought to the emergency department due to nausea, vomiting, and increasing abdominal pain over the last 3 hours. Four weeks ago he was discharged from the hospital following an inpatient admission for acute myocardial infarction. His other medical problems include type 2 diabetes mellitus, hypertension, hypercholesterolemia, and peptic ulcer disease. The patient quit smoking 2 years ago and does not use alcohol or illicit drugs. His temperature is 37.8 C (100 F), blood pressure is 150/90 mm Hg, pulse is 110/min and irregular, and respirations are 22/min. The patient appears to be in severe distress due to pain. The chest is clear to auscultation. Bowel sounds are decreased. There is diffuse abdominal tenderness, but it is more pronounced over the lower right quadrant. There is no peripheral edema. Initial laboratory results are as follows:

Serum chemistry

| | |
|---------------------|-----------|
| Sodium | 140 mEq/L |
| Chloride | 100 mEq/L |
| Bicarbonate | 14 mEq/L |
| Blood urea nitrogen | 25 mg/dL |
| Creatinine | 1.1 mg/dL |
| Glucose | 185 mg/dL |

Liver function studies

| | |
|---------|----------------------------|
| Amylase | 275 U/L |
| Lipase | 80 U/L (normal, 0-160 U/L) |

Urinalysis is within normal limits. Which of the following is the most likely diagnosis in this patient?

- ☐ A. Acute appendicitis
- ☐ B. Acute pancreatitis
- ☐ C. Bowel ischemia
- ☐ D. Diabetic ketoacidosis

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- ☐ E. Peptic ulcer perforation

Submit

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- ☐ A. Acute appendicitis [13%]
- ☐ B. Acute pancreatitis [6%]
- ☒ C. Bowel ischemia [75%]
- ☐ D. Diabetic ketoacidosis [2%]

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- ☐ A. Acute appendicitis [13%]
- ☐ B. Acute pancreatitis [6%]
- ☒ C. **Bowel ischemia** [75%]
- ☐ D. Diabetic ketoacidosis [2%]
- ☐ E. Peptic ulcer perforation [3%]

Proceed to Next Item

Explanation:

User Id: [REDACTED]

| Acute mesenteric ischemia | |
|---------------------------|---|
| Presentation | <ul style="list-style-type: none"> • Rapid onset of periumbilical pain (often severe) • Pain out of proportion to examination findings • Hematochezia (late complication) |
| Risk factors | <ul style="list-style-type: none"> • Atherosclerosis (acute on chronic) • Embolic source (thrombus, vegetations) • Hypercoagulable disorders |
| Laboratory findings | <ul style="list-style-type: none"> • Leukocytosis • Elevated amylase & phosphate levels • Metabolic acidosis (elevated lactate) |
| Diagnosis | <ul style="list-style-type: none"> • CT (preferred) or MR angiography • Mesenteric angiography, if diagnosis unclear |

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This patient's presentation is suggestive of **acute mesenteric ischemia**, which is most commonly due to abrupt arterial occlusion from either of the following:

- **Cardiac embolic events** in the setting of atrial fibrillation, valvular disease, or cardiovascular aneurysms
- Acute thrombosis due to peripheral arterial disease or low cardiac output states

Diagnosis

- CT (preferred) or MR angiography
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This patient likely developed a left ventricular thrombus after his recent myocardial infarction; this thrombus then embolized to the mesenteric artery.

Patients with acute mesenteric ischemia typically experience sudden onset of **severe periumbilical pain** that appears to be **out of proportion to examination findings**. If ischemia is prolonged, patients may develop more focal abdominal tenderness (due to local inflammation/infarction) or peritoneal signs (eg, guarding, rebound tenderness). Laboratory studies typically show leukocytosis, elevated hemoglobin (hemoconcentration), elevated **amylase**, and **metabolic acidosis** due to increased serum lactate levels. In this patient, metabolic acidosis is suggested by the very low bicarbonate level.

Patients with evidence of bowel infarction should undergo immediate operative evaluation; otherwise, diagnosis can be confirmed radiologically by **CT angiography**. Treatment includes open embolectomy with vascular bypass or endovascular thrombolysis. In addition, patients should be started on broad-spectrum antibiotics and, in the absence of active bleeding, anticoagulation to reduce the risk of clot expansion.

(Choice A) Acute appendicitis is uncommon in elderly patients; if it occurs, the presentation is less acute. In addition, in the absence of perforation and significant hypotension, patients with appendicitis rarely develop metabolic acidosis.

(Choice B) Although acute pancreatitis (AP) may present with nausea and abdominal pain, the pain often radiates to the back. A normal lipase result makes AP much less likely as lipase is both more sensitive and specific than amylase.

(Choice D) Diabetic ketoacidosis can present with gastrointestinal manifestations and acidosis, but it usually develops in patients with type 1 diabetes mellitus, does not tend to cause localized abdominal tenderness, and would be unlikely with a glucose level <250 mg/dL.

(Choice E) Peptic ulcer perforation does not commonly localize to the lower right quadrant and is not typically accompanied by metabolic acidosis unless there is

(hemocoagulation), elevated amylase, and metabolic acidosis due to increased serum lactate levels. In this patient, metabolic acidosis is suggested by the very low bicarbonate level.

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(Choice E) Peptic ulcer perforation does not commonly localize to the lower right quadrant and is not typically accompanied by metabolic acidosis unless there is hemodynamic instability with hypovolemia, hypotension, and impending shock.

Educational objective:

Acute mesenteric ischemia is commonly due to abrupt arterial occlusion from cardiac embolic events (eg, ventricular thromboembolism). If ischemia is prolonged, patients may develop more focal findings due to infarction, perforation, or peritonitis. Laboratory studies typically show leukocytosis, elevated hemoglobin, elevated amylase, and metabolic acidosis.

References:

1. **Mesenteric ischemia: Pathogenesis and challenging diagnostic and therapeutic modalities.**
2. **The diagnosis of acute mesenteric ischemia: A systematic review and meta-analysis.**
3. **Acute mesenteric ischemia: A vascular emergency.**