AMSER Case of the Month September 2022

72-year-old female with sudden onset altered mental status

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Patient Presentation

- HPI: Patient presented to ED after son noticed acute onset of altered mental status. 9-1-1 was contacted. On EMS arrival, patient with GSC of 7, oxygen saturation of 87%. Laryngeal mask airway placed after unsuccessful intubation. ET tube later placed in the ED.
- PMHx: COPD, Meningioma, Migraines, Tube feed dependent via G-tube secondary to cervical spinal surgery
- SHx: C5 corpectomy, tubal ligation
- ROS: Limited due to patient's condition
- Vitals: BP 114/97, HR 48, RR 14 SpO2 86%, 36.1℃
- Physical Exam: Pale, unresponsive. Sluggish pupils. Bradycardic. Soft abdomen with large ventral hernia. Thready carotid pulses.
  No facial asymmetry noted.

Pertinent Labs

CBC

- WBC: 13.7 (H)
- RBC: 5.57 (H)
- Hemoglobin: 17.6 (H)
- Hematocrit: 53.6 (H)
- MCV: 96.2
- Platelet: 202

CMP

- Na: 137
- K: 5.9 (H)
- Cl: 102
- CO2: 22
- Glucose: 244 (H)
- Creatinine: 1.22 (H)
- BUN: 24
- Calcium: 10.4 (H)
- Total bilirubin: 1.9 (H)
- AST: 66 (H)
- ALT: 85 (H)

EKG

- Third degree block with ST elevation in inferior-lateral leads

Other labs

- Troponin I: 13
- Lactic acid: 4.8 (HH)
- VBG
  - pH: 7.25 (L)
  - PCO2: 64.6 (H)
  - pO2: 28 (L)
  - HCO3: 28.4 (H)

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

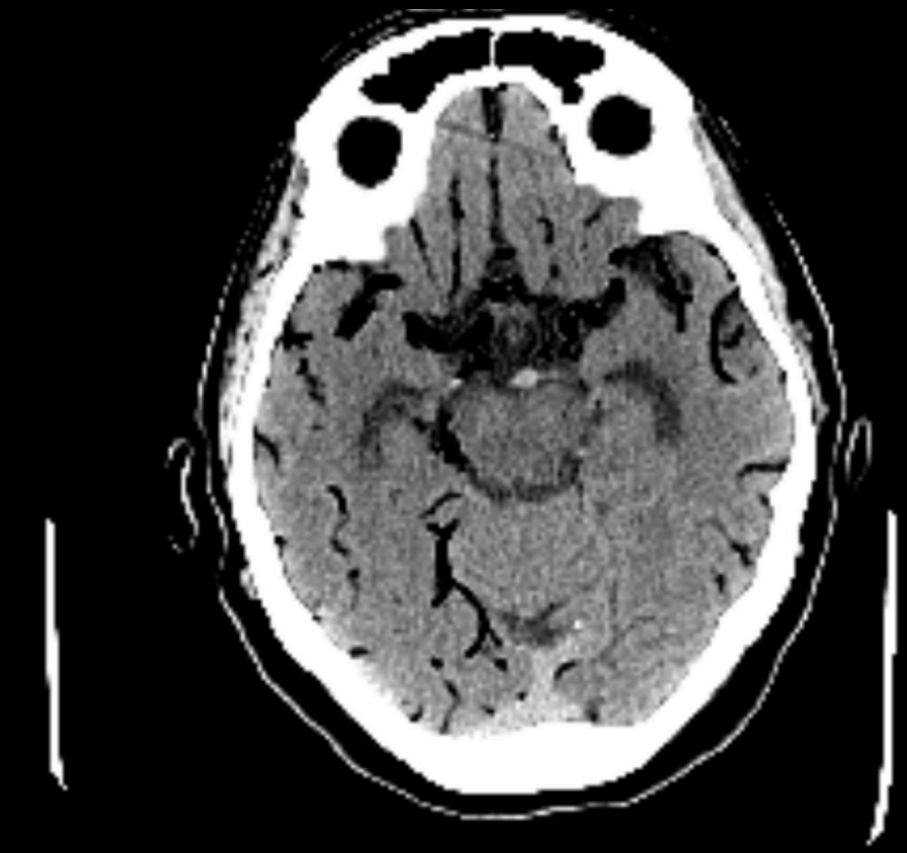
Variant 1: **Acute mental status change. Increased risk for intracranial bleeding (ie, anticoagulant use, coagulopathy), hypertensive emergency, or clinical suspicion for intracranial infection, mass, or elevated intracranial pressure. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
CT head without IV contrast	Usually Appropriate	☢ ☢ ☢
MRI head without IV contrast	Usually Appropriate	O
MRI head without and with IV contrast	May Be Appropriate	O
CT head without and with IV contrast	May Be Appropriate	☢ ☢ ☢
CT head with IV contrast	Usually Not Appropriate	☢ ☢ ☢

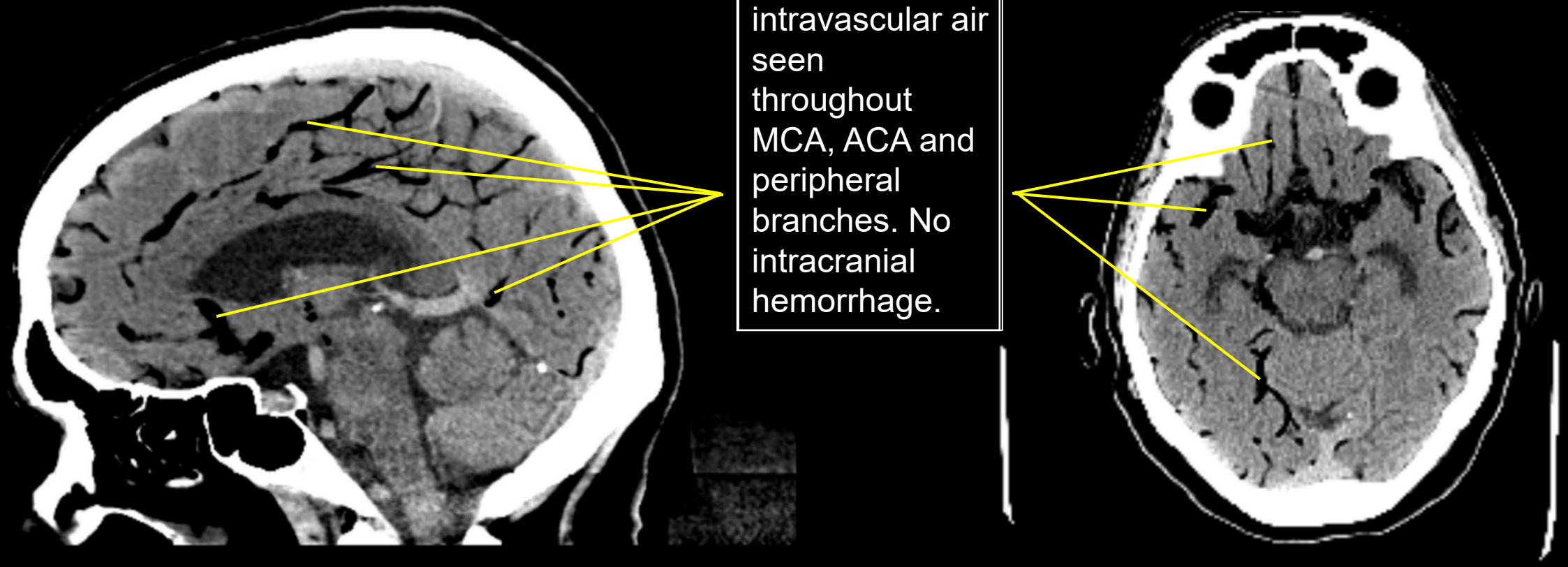
This imaging modality was ordered by the ER physician

American College of Radiology ACR Appropriateness Criteria

Findings CT Head without Contrast



Findings CT Head without Contrast (labeled)



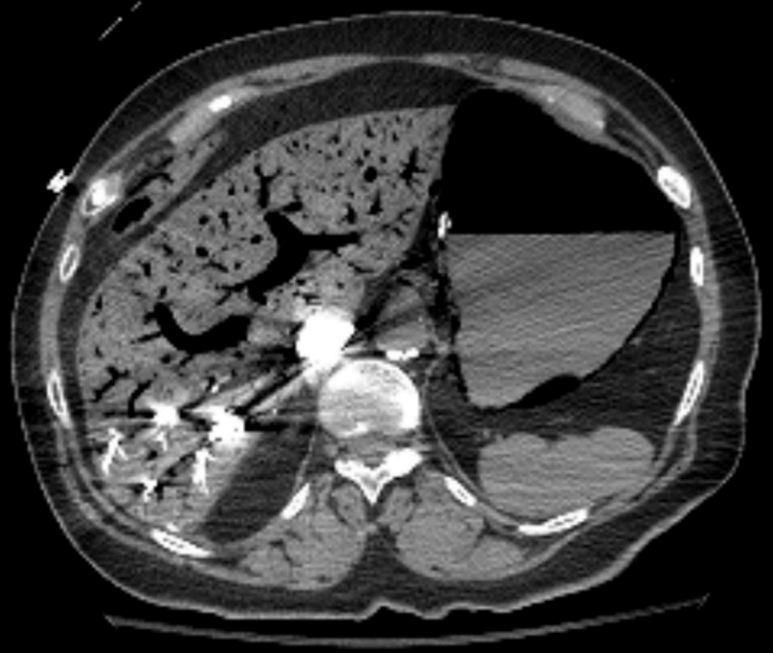
Diffuse intravascular air seen throughout MCA, ACA and peripheral branches. No intracranial hemorrhage.

Case Progression

- CTA of Chest/Abdomen/Pelvis completed to further evaluate for possible hemorrhage or perforation.
- Patient went to cardiac catheterization lab for presumed myocardial infarction where she was found with loss of pulses.
- CPR for 8 total minutes with 2 rounds of epinephrine.
- Patient remained pulseless, resuscitation stopped, and time of death was called.
- CTA chest/abdomen/pelvis later reviewed.

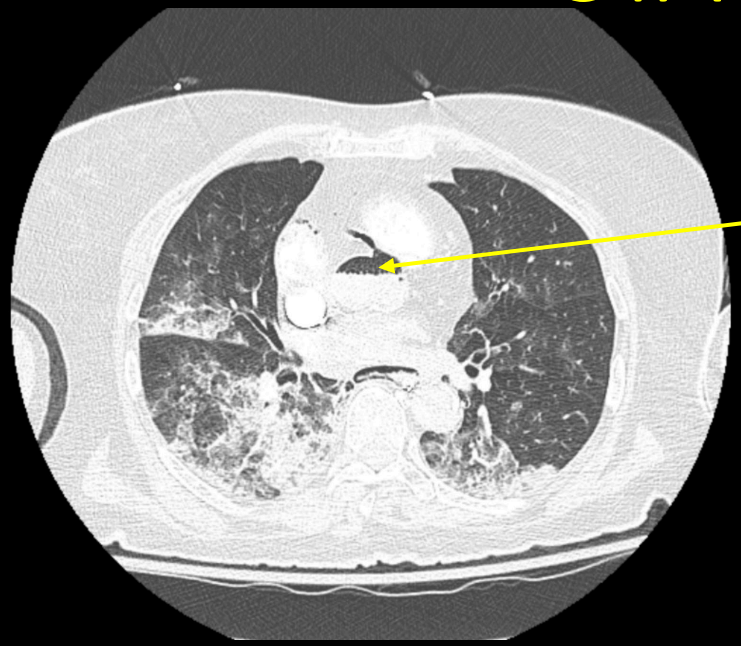
CTA Chest/Abd/Pelvis Findings

Lung window



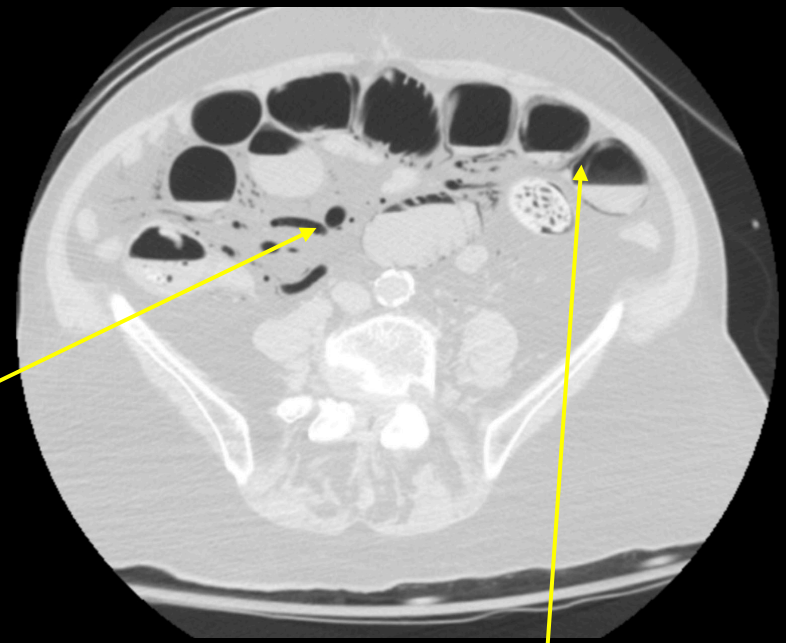
Lung window

CTA Chest/Abd/Pelvis (labeled)

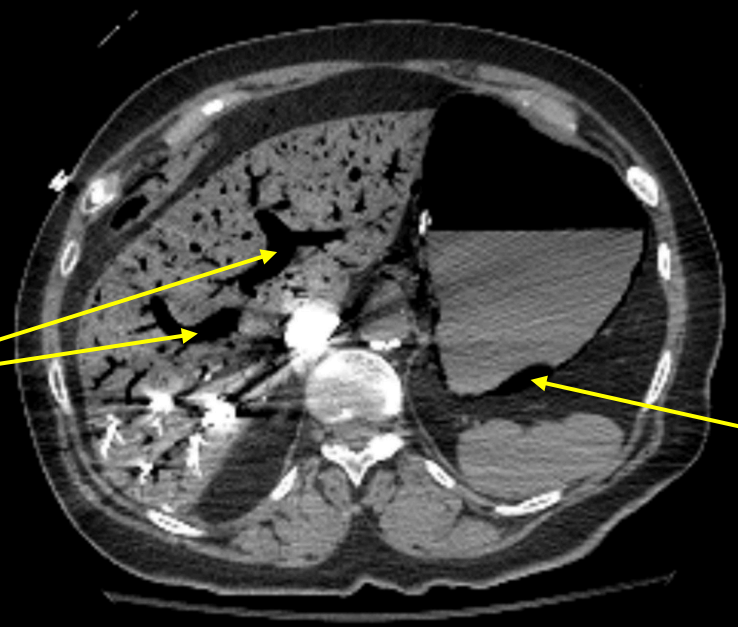


Intraarterial gas involving the aorta and right coronary artery

Mesenteric venous gas



Intramural bowel gas



Intrahepatic (portal) veins with intraluminal gas

Gastric pneumatosis

Final Dx:

Bowel Ischemia with Cardiac Arrest

Case Discussion (1/2)

- Typical acute bowel ischemia manifestations:
  - Abdominal pain is the most common presenting symptom
  - Classic clinical description of “abdominal pain out of proportion to the physical exam.”
  - Patients appear acutely ill and abdominal tenderness may not be prominent early
  - Laboratory studies may show signs of acidosis, with lactic acidosis indicating severe ischemia or irreversible bowel injury
- Etiologies of altered circulation
  - Often the result of diminished blood flow or obstruction (Table 1). Etiology in our patient remains uncertain.
  - Leading to insufficient oxygen delivery to meet metabolic demands
  - A further etiology to consider is nonocclusive mesenteric ischemia, thought to be due to splanchnic hypoperfusion and vasoconstriction

Table 1. Causes of Altered Mesenteric Circulation.

Atherosclerosis
Arterial embolus
Arterial dissection
Thrombosis
Vasculitis
Mesenteric venous thrombosis
Poor cardiac output leading to low mesenteric flow
Inflammatory or other conditions affecting mesenteric vessels (e.g., pancreatitis, perforated ulcer, tumor)

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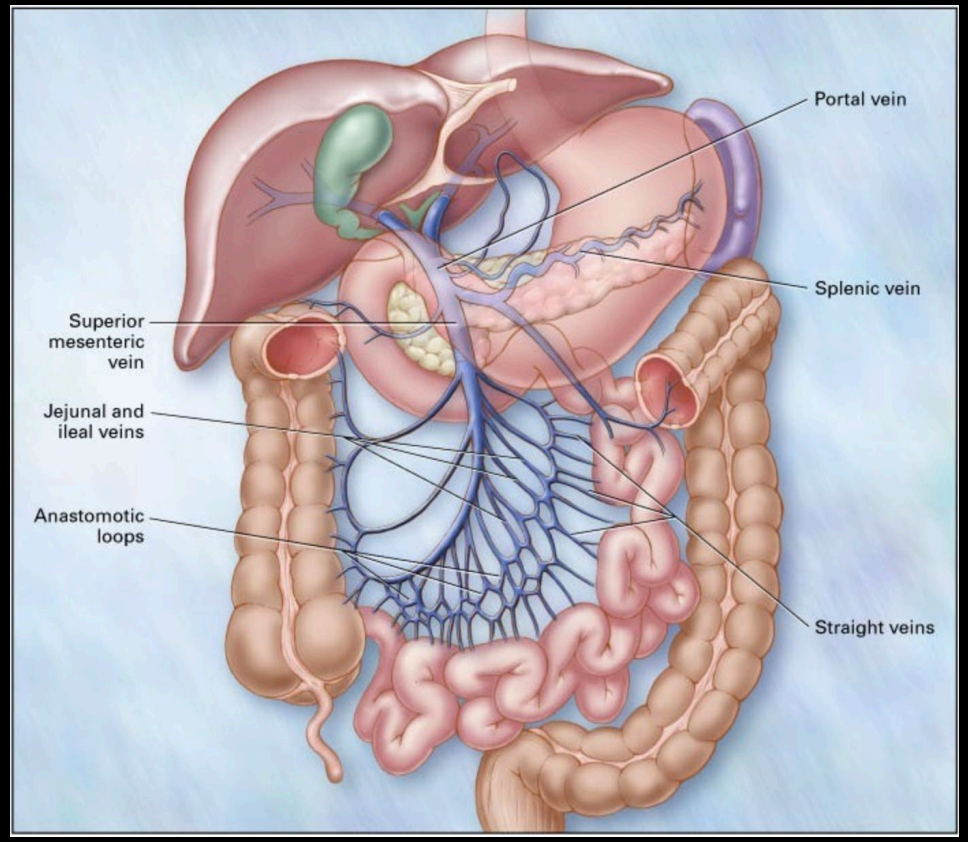
Case Discussion (2/2)

- Pathophysiology
  - Mesenteric circulation consists of three primary arteries: celiac artery, superior mesenteric artery, and inferior mesenteric artery
  - Ischemia results in vasodilation initially, but vasoconstriction results after prolonged ischemia
  - Mucosa and submucosa necrosis impairs protective barriers against the infiltration of bacteria from the intestinal lumen. Gas released in the bowel wall (pneumatosis intestinalis)
  - Gas travels through mesentery vessels, reaching the portal vein (Figure 1)
  - Sepsis, intestinal perforation, and/or death can ensue
- Management per UpToDate
  - Pain control – parenteral opioids
  - Anticoagulation if secondary to mesenteric arterial or venous occlusion, or nonocclusive mesenteric ischemia
  - Antibiotics – broad-spectrum
  - Surgery consult if intestinal infarction or perforation is suspected to evaluate need for laparotomy

Figure 1: Normal Mesenteric Venous Circulation



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References:

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