

# AMSER Case of the Month

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74 yo female s/p TNK treatment for ischemic cerebral infarct  
with acute encephalopathy and worsening anemia

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# Patient History

- PMHx included atrial fibrillation, CAD s/p CABG, diabetes mellitus, hypothyroidism, hypertension, hyperlipidemia, chronic kidney disease, prior PCA stroke
- PSHx: CABG
- Home meds: amlodipine 10 mg, aspirin 81 mg, atorvastatin 40 mg, isosorbide mononitrate 60 mg, levetiracetam 500 mg, levothyroxine 125 mg, losartan 100 mg, nitroglycerin 0.4 mg, omeprazole 40 mg

# Patient Presentation

- 74 yo female originally presenting with neurologic deficits
- Evaluation and imaging for suspected stroke revealed acute ischemic infarct in R lateral frontal lobe
- Pt met the criteria for treatment with TNK and received TNK treatment with subsequent anti-coagulation with heparin and aspirin
- On hospital day 7, a rapid response was called for acute encephalopathy, fixed dilated pupils, and systolic BP in the 60s
- The nurse reported inadequate physical exam d/t the pt not being able to follow commands

# Pertinent Labs

- CBC revealed Hgb 6.2, decreased from 9.4 earlier the same day

What Imaging Should We Order?

# Imaging

- CT Head was negative for new brain pathology

# ACR Appropriateness Criteria for Suspected RP Bleed

New 2021

[2]

American College of Radiology  
ACR Appropriateness Criteria®  
Suspected Retroperitoneal Bleed

**Variant 1:** Clinically suspected retroperitoneal bleed. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	⊕⊕⊕
CT abdomen and pelvis without and with IV contrast	Usually Appropriate	⊕⊕⊕⊕
CTA abdomen and pelvis with IV contrast	Usually Appropriate	⊕⊕⊕⊕⊕
Aortography abdomen and pelvis	May Be Appropriate (Disagreement)	⊕⊕⊕⊕
CT abdomen and pelvis without IV contrast	May Be Appropriate	⊕⊕⊕
US abdomen and pelvis	Usually Not Appropriate	○
Radiography abdomen and pelvis	Usually Not Appropriate	⊕⊕⊕
MRA abdomen and pelvis with IV contrast	Usually Not Appropriate	○
MRA abdomen and pelvis without and with IV contrast	Usually Not Appropriate	○
MRA abdomen and pelvis without IV contrast	Usually Not Appropriate	○
MRI abdomen and pelvis without and with IV contrast	Usually Not Appropriate	○
MRI abdomen and pelvis without IV contrast	Usually Not Appropriate	○
RBC scan abdomen and pelvis	Usually Not Appropriate	⊕⊕⊕

This imaging modality was ordered

# Findings (unlabeled)



CT Abdomen/Pelvis non-contrast, Axial



CT Abdomen/Pelvis non-contrast, Sagittal



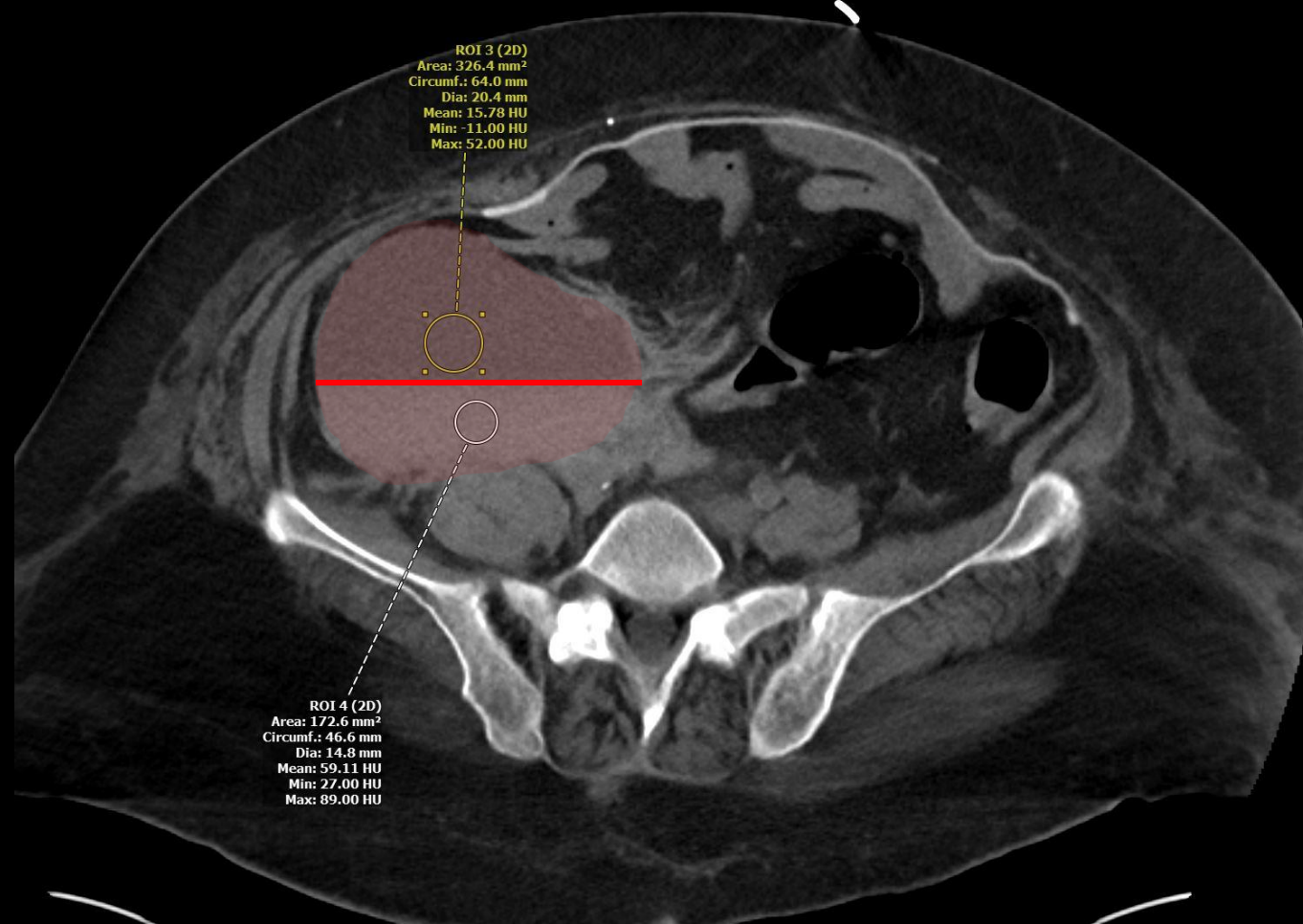
# Findings (labeled)

## Hounsfield units

- upper segment: 15.8 HU
- lower segment: 59.1 HU

Localized collection of fluid with fluid-fluid level in the retroperitoneal space of the R pelvis

Hematocrit effect  
(visualized by red line)



Final Dx:

Spontaneous Retroperitoneal Hematoma

# Case Discussion

- **Epidemiology / Risk Factors / Pathogenesis**
  - Causes / Risk factors
    - Trauma (most common)
    - Iatrogenic (particularly resulting from IR and catheterization lab procedures)
    - Extensive anticoagulation (likely the cause in this patient)
    - Ruptured aortic aneurysm
    - Ruptured renal aneurysm
    - Acute pancreatitis
    - Malignancy
  - Pathogenesis
    - Accumulation of blood in the retroperitoneal space due to damage to vessels or retroperitoneal organs (e.g., kidneys, pancreas, distal duodenum)
  - Mortality
    - A study from 2011 reported mortality of 5.6% at 7 days, 19.1% at 6 months<sup>[3]</sup>

# Case Discussion

- **Clinical Features**

- May present asymptotically until there is significant blood loss
- Abdominal pain
- Flank pain
- Upper leg pain
- Hematuria
- Shock
- Hypotension

# Case Discussion

- **Diagnosis and Imaging**

- Blood collection may compress femoral nerve
  - Can manifest as weakness in knee extension and/or hip flexion, and diminished patellar reflex
- Labs: order CBC
- Preferred imaging: CT abdomen pelvis without contrast
  - Can use contrast if there is concern for active bleeding/need for localization for intervention
- Hematocrit effect
  - Fluid-fluid level resulting from layering effect of heavier cellular components of blood settling below plasma and fluid components
  - Most frequently seen in the setting of anticoagulation or coagulopathy

# Case Discussion

- **Management of retroperitoneal bleeding**
  - Depends on the etiology
  - Traumatic etiology: laparotomy
  - Non-traumatic etiology (spontaneous retroperitoneal hematoma)
    - Specific treatment will depend on location and extent of bleeding
    - Discontinue and reverse anticoagulation (if applicable)
    - Fluid resuscitation if the pt is hemodynamically unstable
    - Blood transfusion indicated in pts with anemia

# Case Discussion

- **Management of retroperitoneal bleeding**
  - Research
    - Postprocedural pts with retroperitoneal hematoma do well with blood transfusion alone
    - One study from 2011 reports 24.7% of pts undergo embolization procedure and 6.7% of pts undergo surgical procedure<sup>[3]</sup>
    - Another study from 2019 reports 16% of pts undergo invasive intervention<sup>[1]</sup>
    - 40% of pts require ICU management<sup>[3]</sup>
    - Spontaneous retroperitoneal hematoma is associated with high mortality but is typically not the direct cause of death<sup>[1]</sup>

# Case Discussion

- **Prevention**

- Given trauma is the most common etiology, prevention is focused on accidental injury prevention through enhanced health policy and public health services
- Prevention of non-traumatic cases is focused on proper procedural technique, adequate monitoring of vitals in high-risk pts, and consistent physical exams in high-risk pts



# References:

[1] Baekgaard JS, Eskesen TG, Lee JM, et al. Spontaneous Retroperitoneal and Rectus Sheath Hemorrhage-Management, Risk Factors and Outcomes. *World J Surg.* 2019;43(8):1890-1897.

[2] Expert Panel on Vascular Imaging, Verma N, Steigner ML, et al. ACR Appropriateness Criteria® Suspected Retroperitoneal Bleed. *J Am Coll Radiol.* 2021;18(11S):S482-S487.

[3] Sunga KL, Bellolio MF, Gilmore RM, Cabrera D. Spontaneous retroperitoneal hematoma: etiology, characteristics, management, and outcome. *J Emerg Med.* 2012;43(2):e157-e161.