AMSER Case of the Month July 2025

32 year old female with RLQ Pain

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Patient Presentation

- HPI: 32 year old female who initially presented with RLQ pain. Pain is sharp with rebound tenderness. Rovsing's sign, McBurney's sign, and psoas sign are all positive. Patient presented to the ER the day before with similar symptoms, labs were unremarkable and CT did not find any acute abnormalities. Denies any heavy lifting or trauma.
- PMH: Depression, MS (receives interferon beta 1a injections)
- PSH: C-section, cholecystectomy
- Physical Exam: GCS score 15, abdominal tenderness in RLQ with guarding. No rebound tenderness.

Pertinent Labs

- CBC: WBC 4.7, HGB 13.5, HCT 40.4, PLT 235
- CMP: Na 140, K 4.0, Cl 110, HCO3 27.0, BUN 11, Cr 0.61, Glucose 97, AST 95, ALT 156
- B-HCG (from ER visit the day prior): NEGATIVE
- UA (from ER visit the day prior): Cloudy appearance, negative leukocyte esterase, negative WBC, positive RBC

Differential Diagnosis

- Acute Appendicitis
- Ovarian Torsion
- Obstructing Kidney Stone
- Rectus Hematoma or Tear
- Abdominal Tissue Necrosis (due to interferon beta 1a injections)

What Imaging Should We Order?

ACR Appropriateness Criteria

Variant 2: **Right lower quadrant pain, fever, leukocytosis. Suspected appendicitis. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	☢☢☢
CT abdomen and pelvis without IV contrast	May Be Appropriate	☢☢☢
US abdomen	May Be Appropriate	O
US pelvis	May Be Appropriate	O
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate	O
MRI abdomen and pelvis without IV contrast	May Be Appropriate	O
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
Radiography abdomen	Usually Not Appropriate	☢☢
WBC scan abdomen and pelvis	Usually Not Appropriate	☢☢☢☢
Fluoroscopy contrast enema	Usually Not Appropriate	☢☢☢

This imaging modality was ordered by the physician

CT Findings (unlabeled)

CT Findings (labeled)

No acute abnormality was identified, with a normal appendix (→) noted.

Given the Repeat ER Visits, Persistent Pain and Significant Tenderness,
What Other Imaging Should We Consider?

ACR Appropriateness Criteria Continued

Variant 2: **Right lower quadrant pain, fever, leukocytosis. Suspected appendicitis. Initial imaging.**

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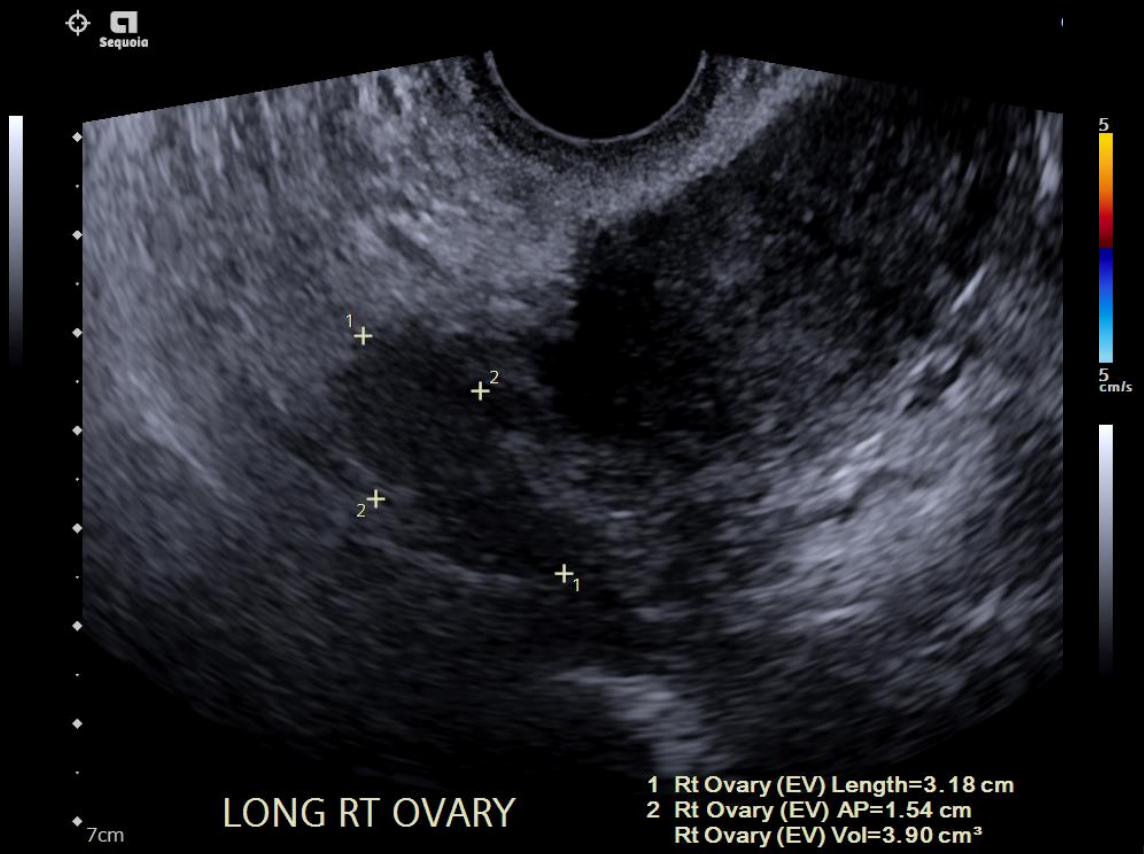
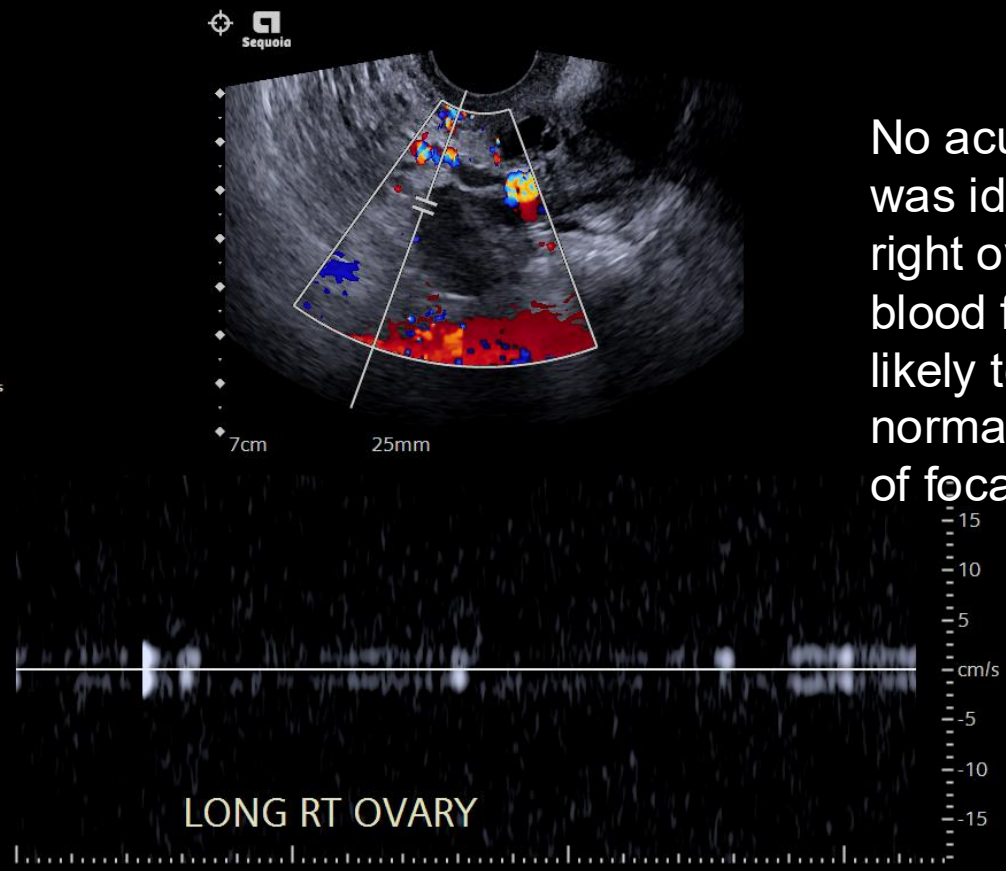
US Findings





No acute abnormality was identified. Faint right ovary Doppler blood flow was noted, likely technical given normal size and lack of focal tenderness.

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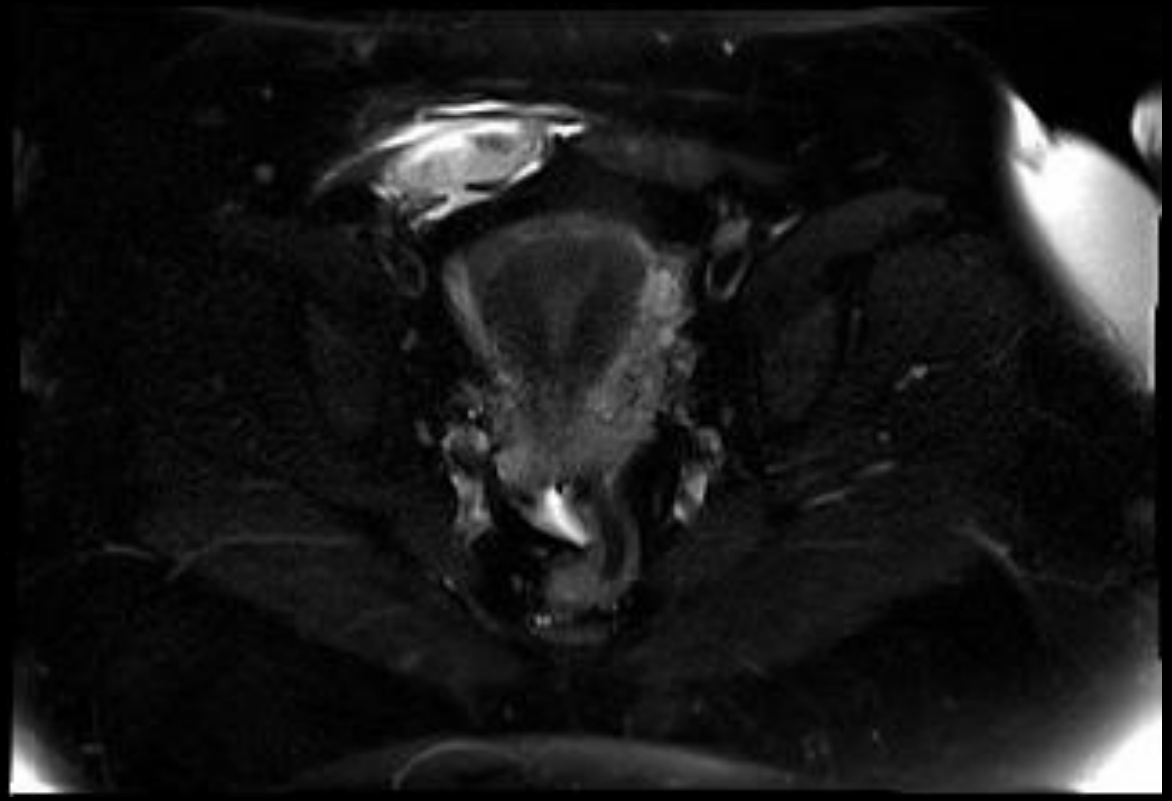
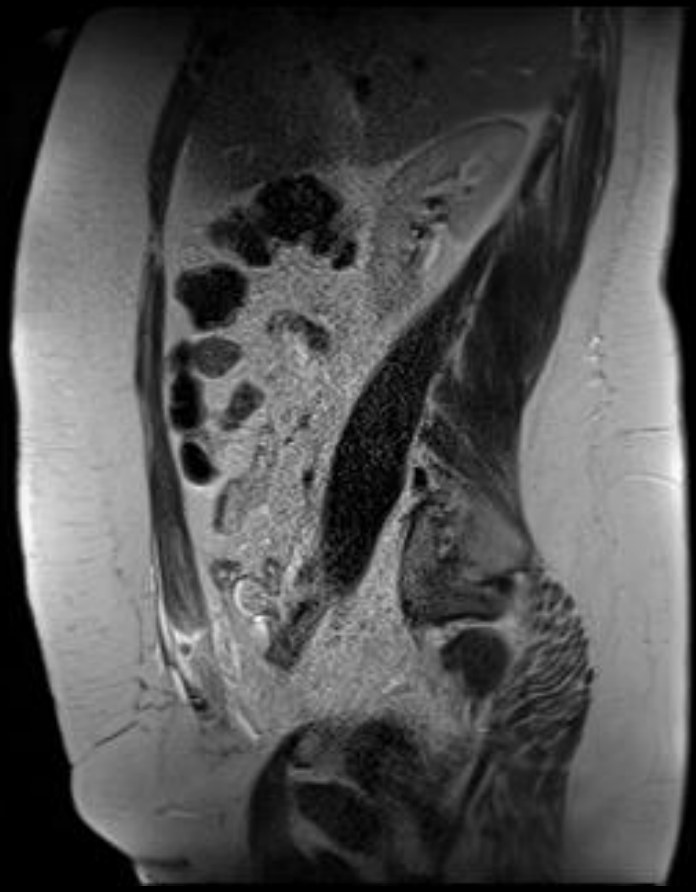
MRI Findings (unlabeled)

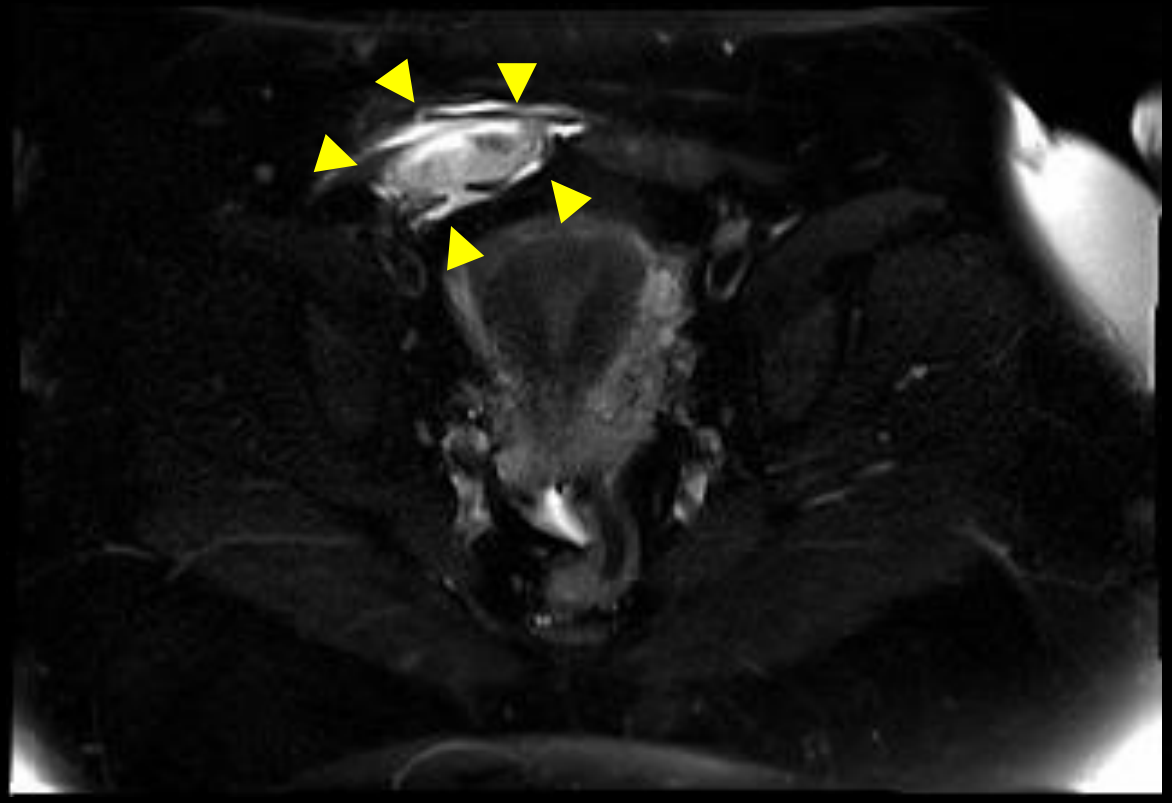


Axial T2 Fat Sat

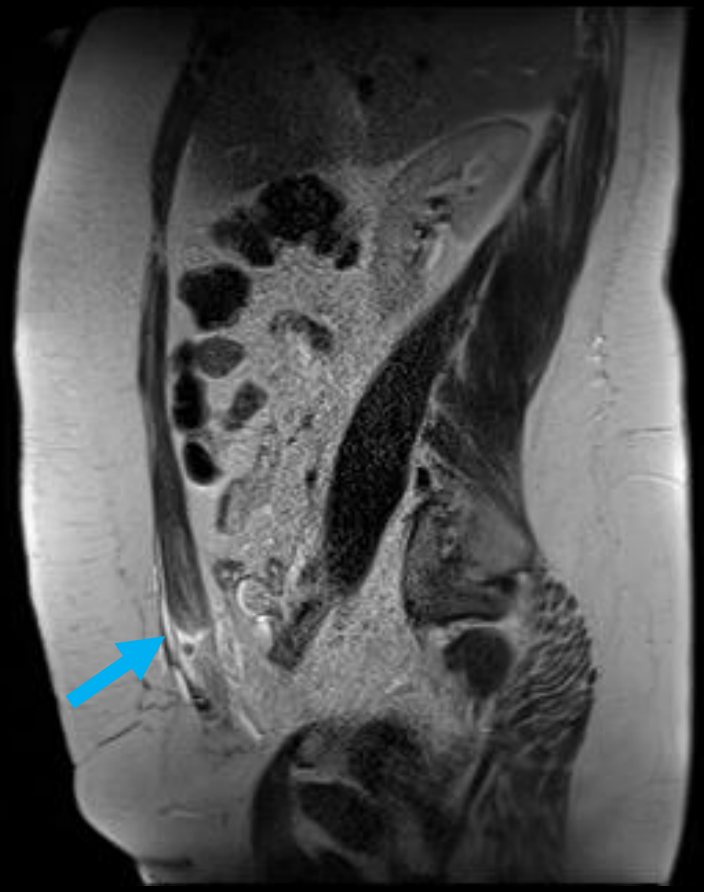


Coronal T2

MRI Findings (unlabeled)



Axial T2 Fat Sat



Coronal T2

Enlargement and localized edema of the right lower rectus abdominus muscle (>).

Complete or near-complete fluid-intensity tear through the muscle (→).

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Summary of Imaging Findings

- CT Abdomen Pelvis with Contrast: Negative findings for appendicitis. No acute pathology.
- Ultrasound Pelvis: Normal size and adequate blood flow to both ovaries. No evidence of ovarian torsion.
- MRI Pelvis with and without Contrast: Crescentic partial tear of the right lower rectus abdominis. Intramuscular and surrounding edema.

Final Dx:

Rectus Abdominis Tear

Case Discussion

- The patient experienced some improvement after dilaudid administration. Surgical intervention was not performed in this case.
- Conservative management consisting of rest and core strengthening exercises was recommended. Healing was anticipated to take 4-6 weeks.

Case Discussion Continued.

- Other case reports of rectus abdominis tears note the utility of performing bedside ultrasound. They also stress the importance of maintaining a broad differential during the evaluation of right lower quadrant pain.[1-3]
- Rectus abdominis tears have been reported in patients with a social history notable for yoga or extensive exercise.[4]
- A study which evaluated rectus abdominis tears in 11 tennis players notes that ultrasound is a sensitive imaging technique and that MRI does not provide any additional information.[5]

References:

1. Haider H, Montgomery JR, Spicer PJ. Rectus abdominus tear in a collegiate cheerleader. *Radiology Case Reports.* 2023;18(1):37–39. doi:10.1016/j.radcr.2022.09.083

2. Minardi J, Shaver E, Monseau A, Pratt A, Layman SM. Right Lower Quadrant Pain in a Young Female: Ultrasound Diagnosis of Rectus Abdominis Tear. *J Emerg Med.* 2015;49(5):623–626. doi:10.1016/j.jemermed.2015.05.013

3. Ruff AN, Cornelson SM, Panter AS, Kettner NW. Rectus abdominis muscle tear diagnosed with sonography and its conservative management. *Journal of Ultrasound.* 2020;23(3):401–406. doi:10.1007/s40477-019-00416-y

4. Matalon SA, Askari R, Gates JD, Patel K, Sodickson AD, Khurana B. Don't Forget the Abdominal Wall: Imaging Spectrum of Abdominal Wall Injuries after Nonpenetrating Trauma. *Radiographics*. 2017;37(4):1218-1235. doi:10.1148/rg.2017160098

5. Connell D, Ali K, Javid M, Bell P, Batt M, Kemp S. Sonography and MRI of rectus abdominis muscle strain in elite tennis players. *AJR Am J Roentgenol*. 2006;187(6):1457-1461. doi:10.2214/AJR.04.1929

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