AMSER Case of the Month June 2025

42-year-old female presenting with intermittent right lower quadrant abdominal pain

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Patient Presentation

- HPI: A 42-year-old female presented to the emergency room with waxing and waning right lower quadrant pain for two days. The pain worsens with positional changes. She denies nausea, vomiting, vaginal bleeding, fever, or chills.

Patient Presentation Continued

- Medical History: Primary biliary cholangitis
- Gynecological History: G2P002, HPV infection status post cervical cryotherapy, currently with intrauterine device
- Surgical History : Cholecystectomy

Patient Presentation Continued

- Vitals: 37 C, HR 92, BP 117/79, RR 12, SpO2: 99%

- Physical Exam: Soft, nondistended, mild tenderness to palpation to right lower quadrant. No guarding or rebound.

Pertinent Labs

- CBC: Normal
- BMP: Normal
- Urinalysis: Normal
- B-HCG: Negative
- AFP, LDH, Estradiol, Inhibin B, CA 125: Negative

What Imaging Should We Order?

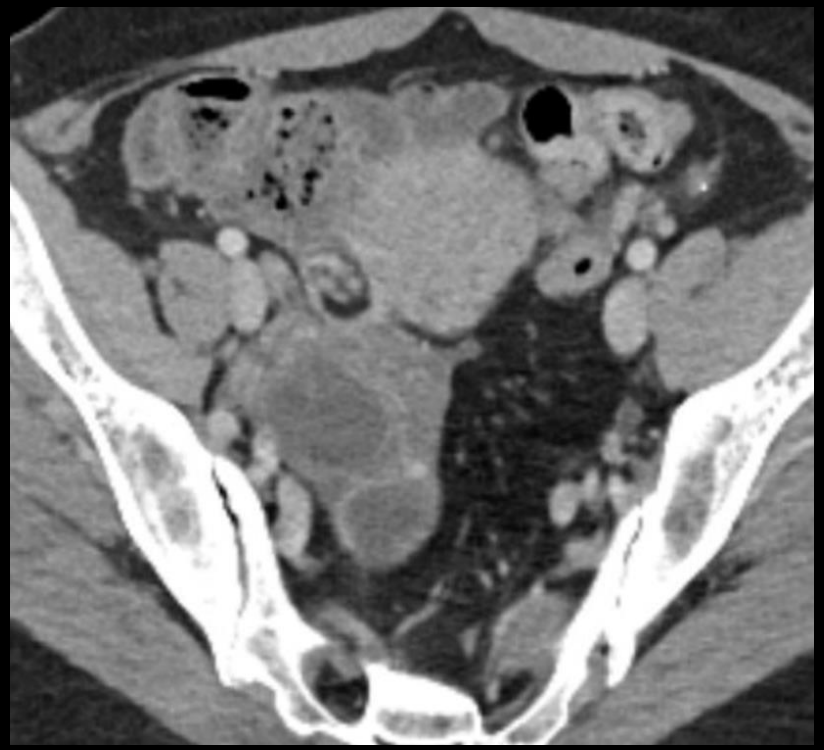
Select the applicable ACR Appropriateness Criteria

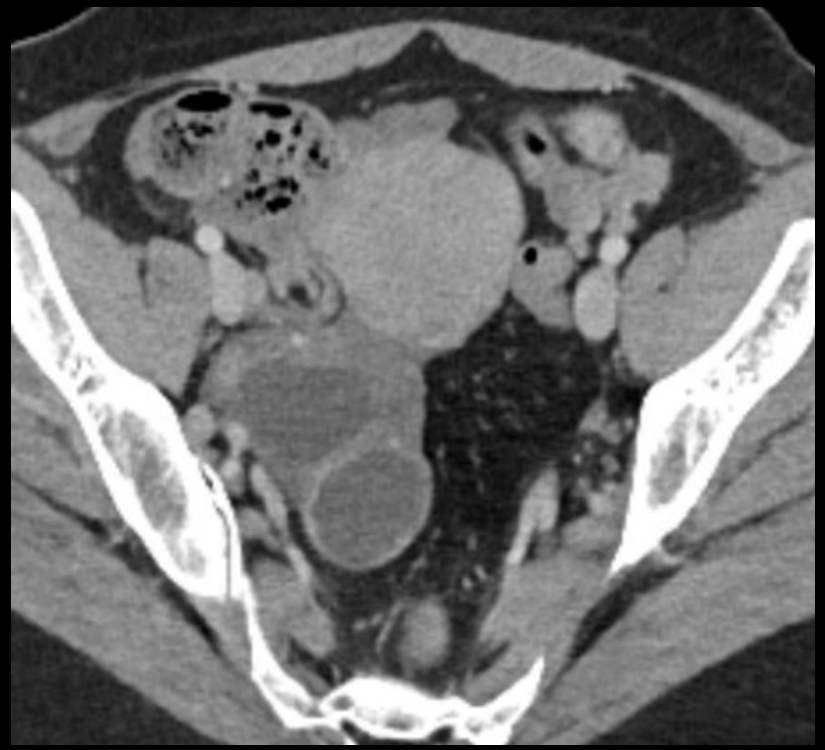
Variant 1: **Right lower quadrant pain. Initial imaging.**

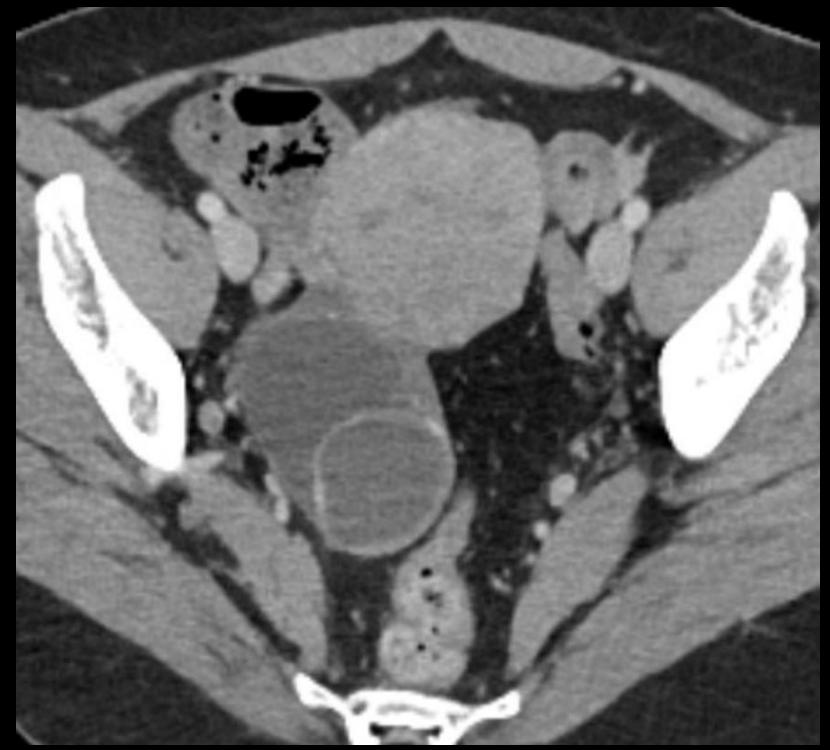
Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	☢☢☢
US abdomen	May Be Appropriate	O
US pelvis	May Be Appropriate	O
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate	O
MRI abdomen and pelvis without IV contrast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

CT abdomen and pelvis with IV contrast was ordered.

Findings (Unlabeled)







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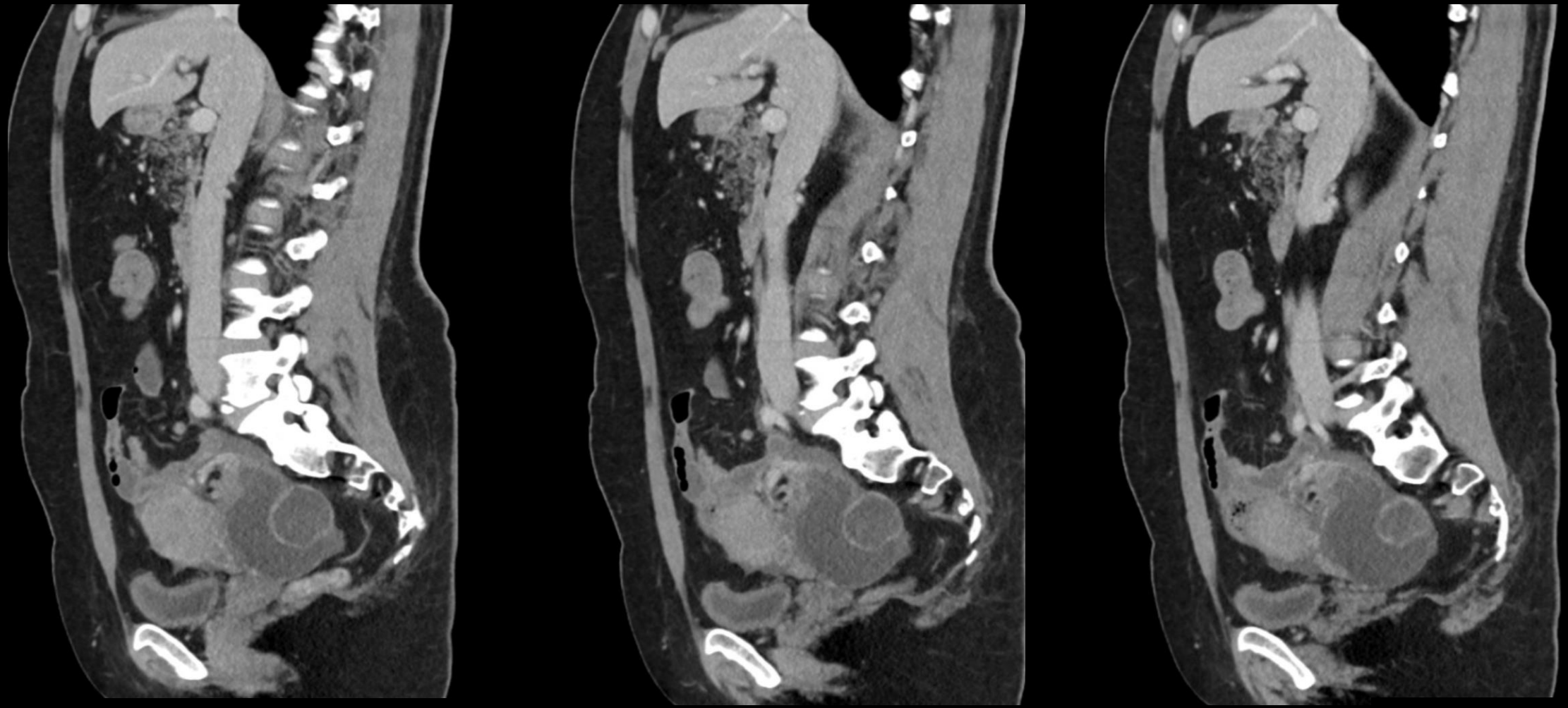
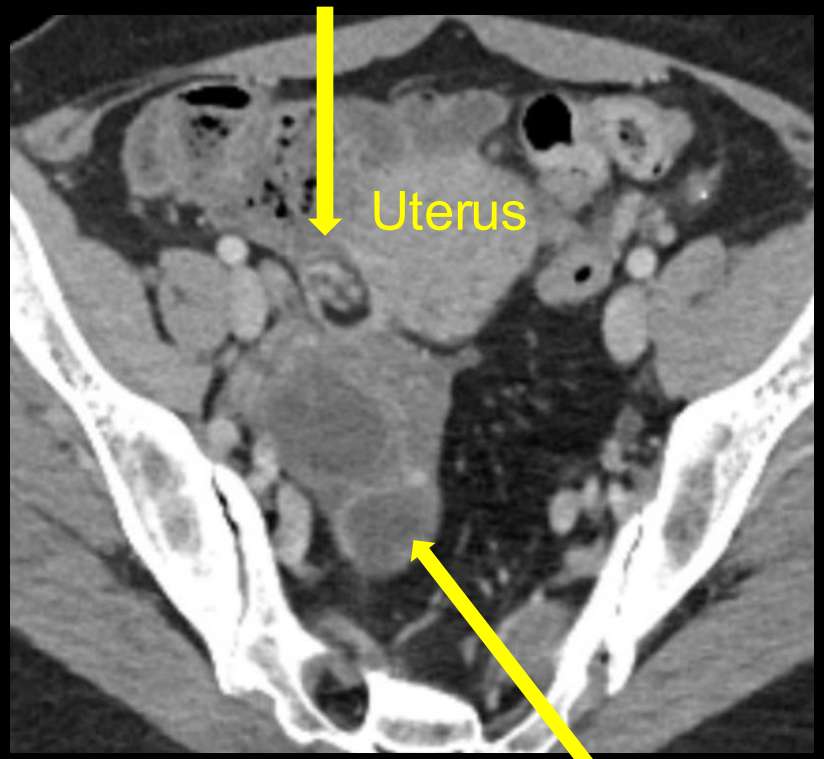
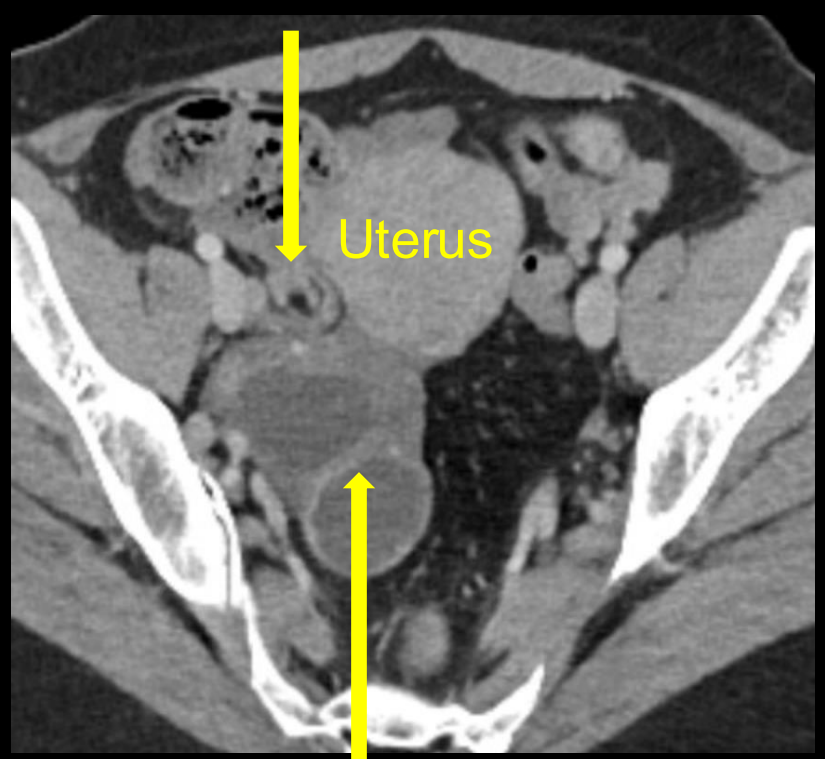
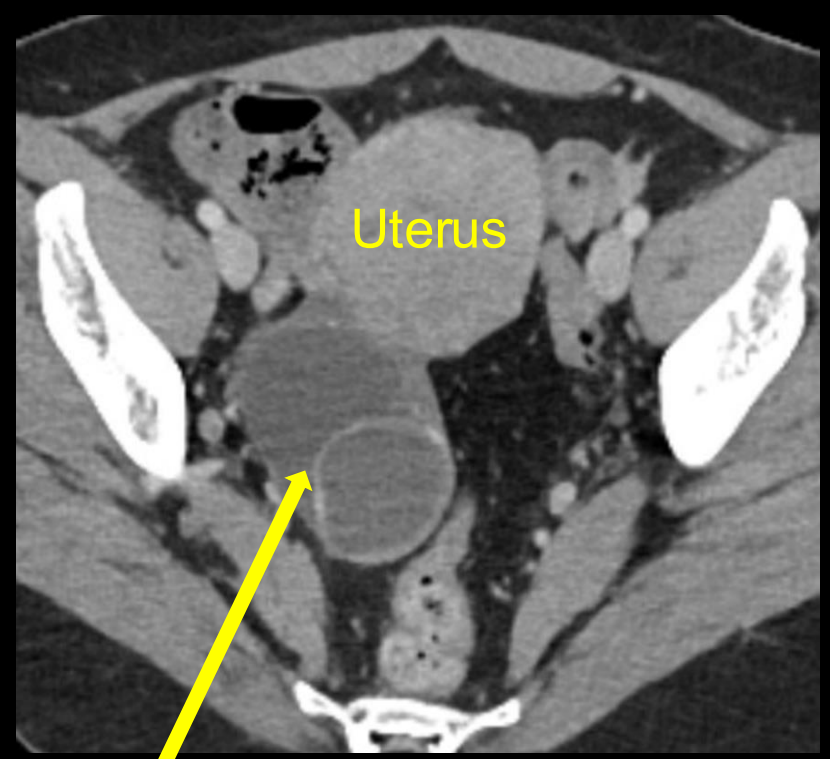


Findings (Labeled)

Twisted ovarian pedicle known as ”whirlpool sign”`







Enlarged, multiloculated, right ovary measuring 7.7 x 5.2 x 7.3 cm

CT Contrast Enhanced Axial

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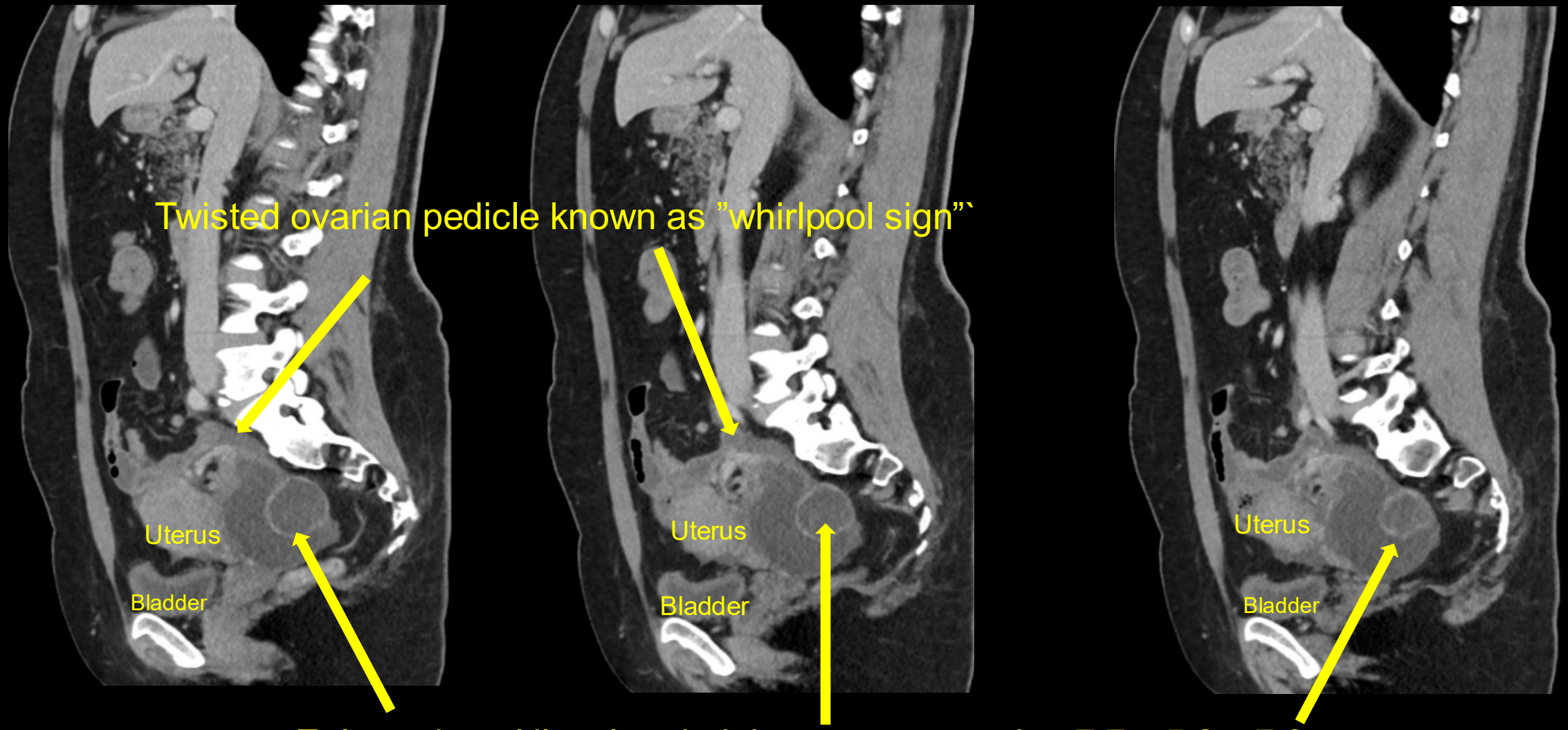
Findings: (Labeled)



CT Contrast Enhanced Sagittal

Select the applicable ACR Appropriateness Criteria

Variant 2: **Adult patient assigned female at birth. Adnexal mass, likely benign, no acute symptoms. Premenopausal. Follow-up imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
US duplex Doppler pelvis	Usually Appropriate	O
US pelvis transabdominal	Usually Appropriate	O
US pelvis transabdominal and US pelvis transvaginal	Usually Appropriate	O
US pelvis transvaginal	Usually Appropriate	O
MRI pelvis without and with IV contrast	May Be Appropriate	O
MRI pelvis without IV contrast	May Be Appropriate	O
CT pelvis with IV contrast	Usually Not Appropriate	☢☢☢
CT pelvis without IV contrast	Usually Not Appropriate	☢☢☢
CT pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	☢☢☢☢

Subsequent transvaginal pelvis US ordered to confirm diagnosis.

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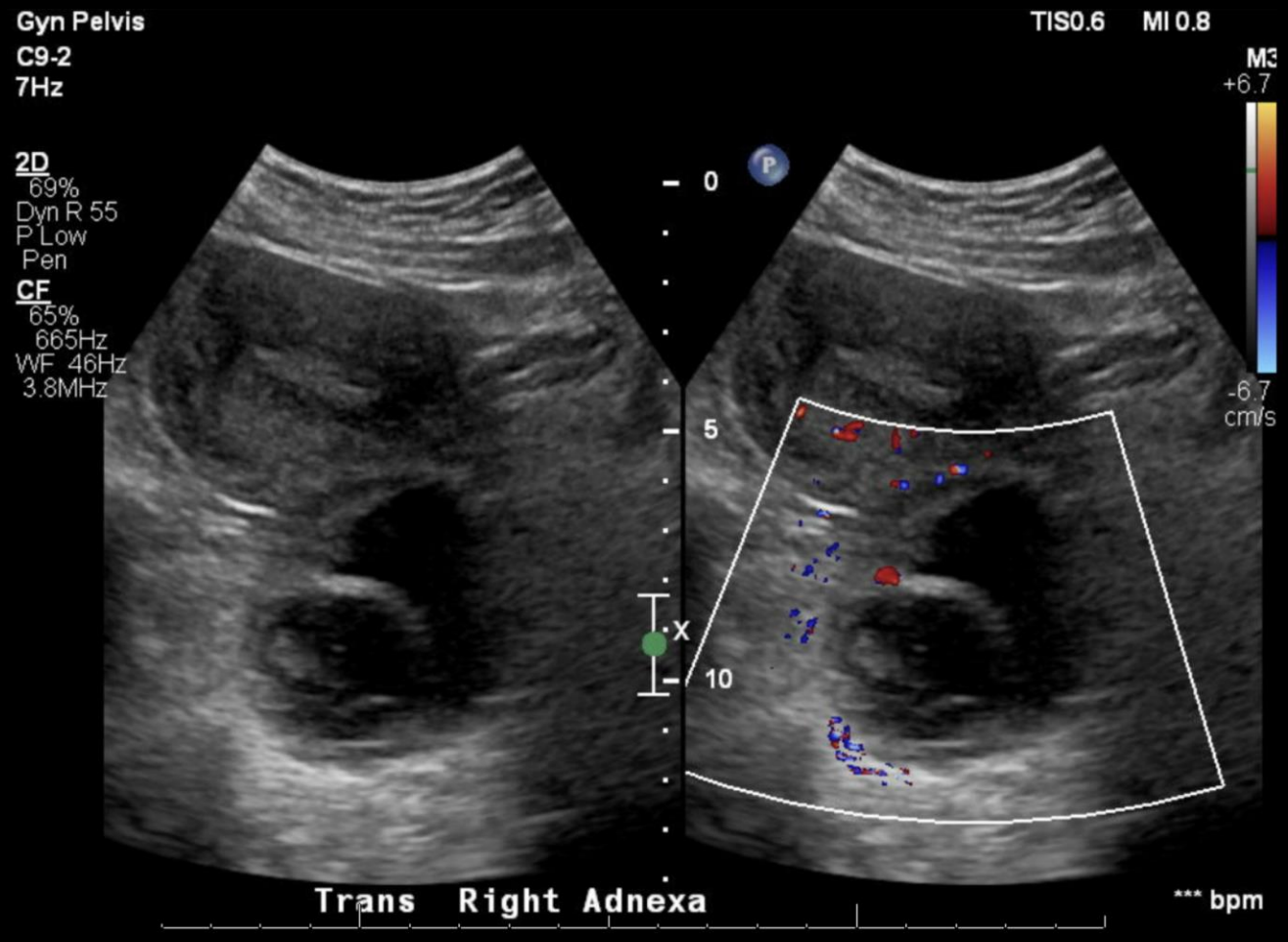
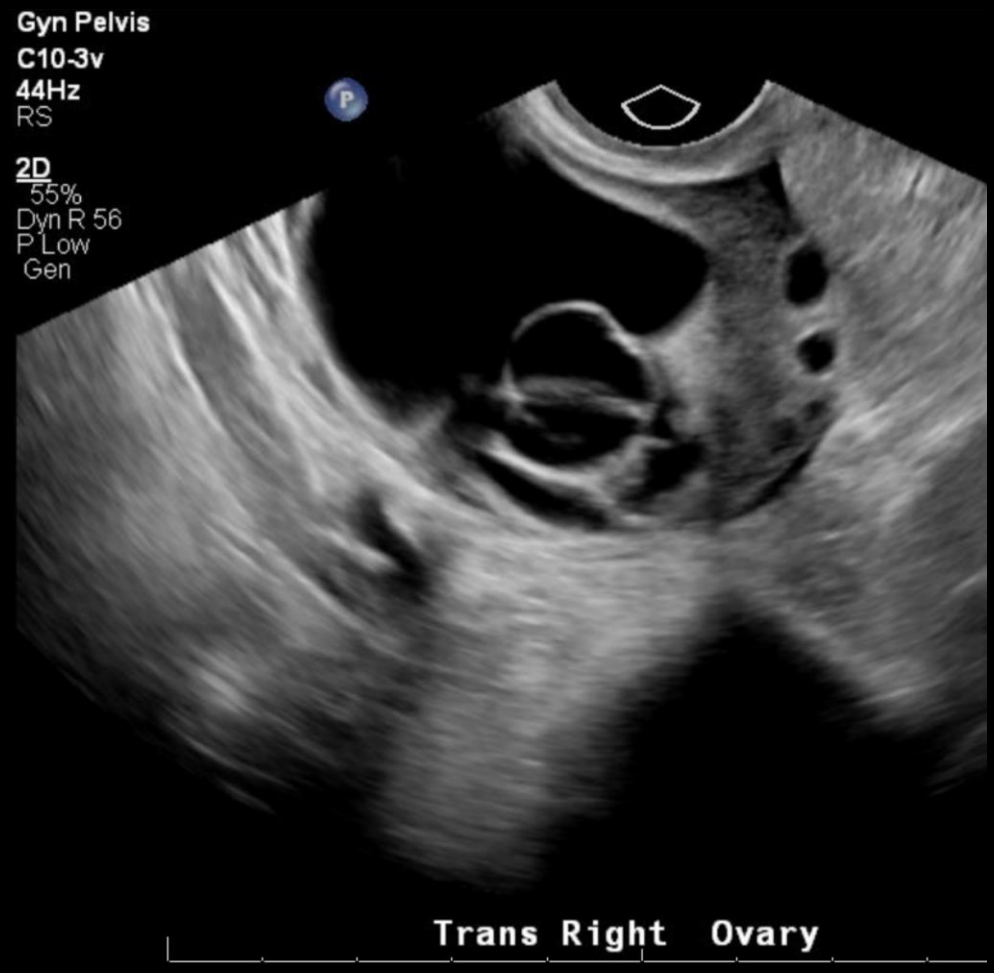
Findings (Unlabeled)





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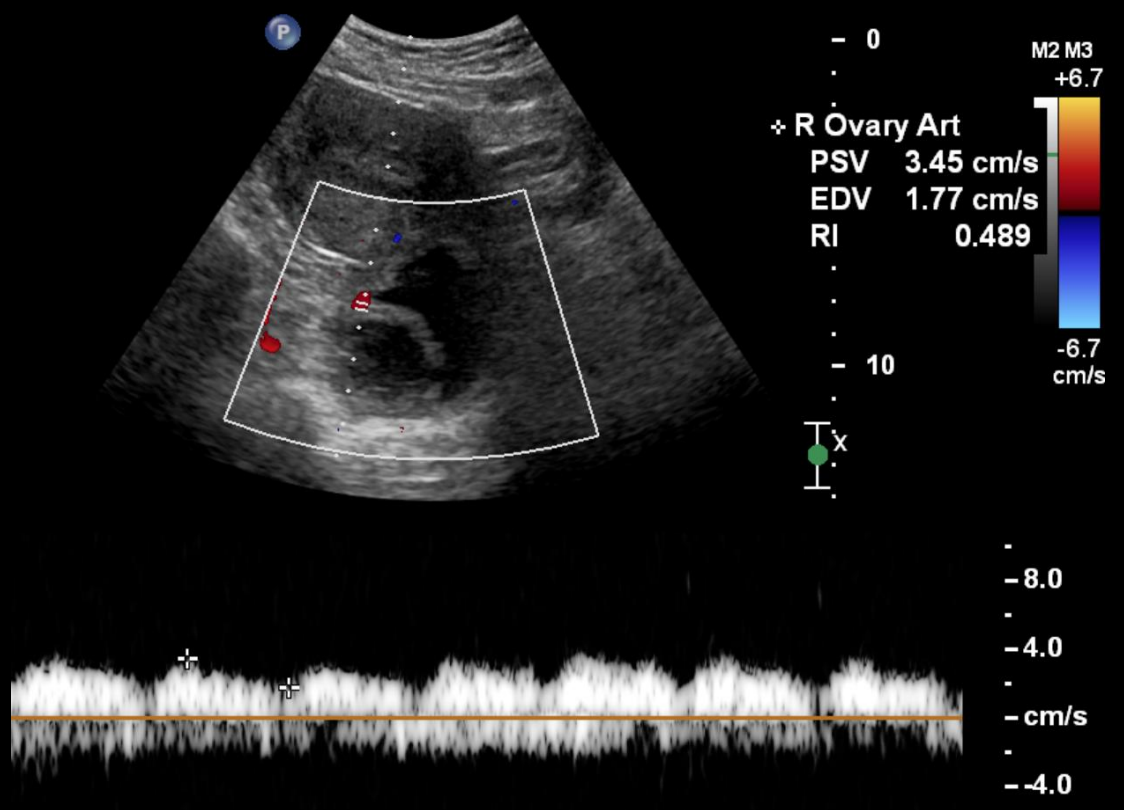
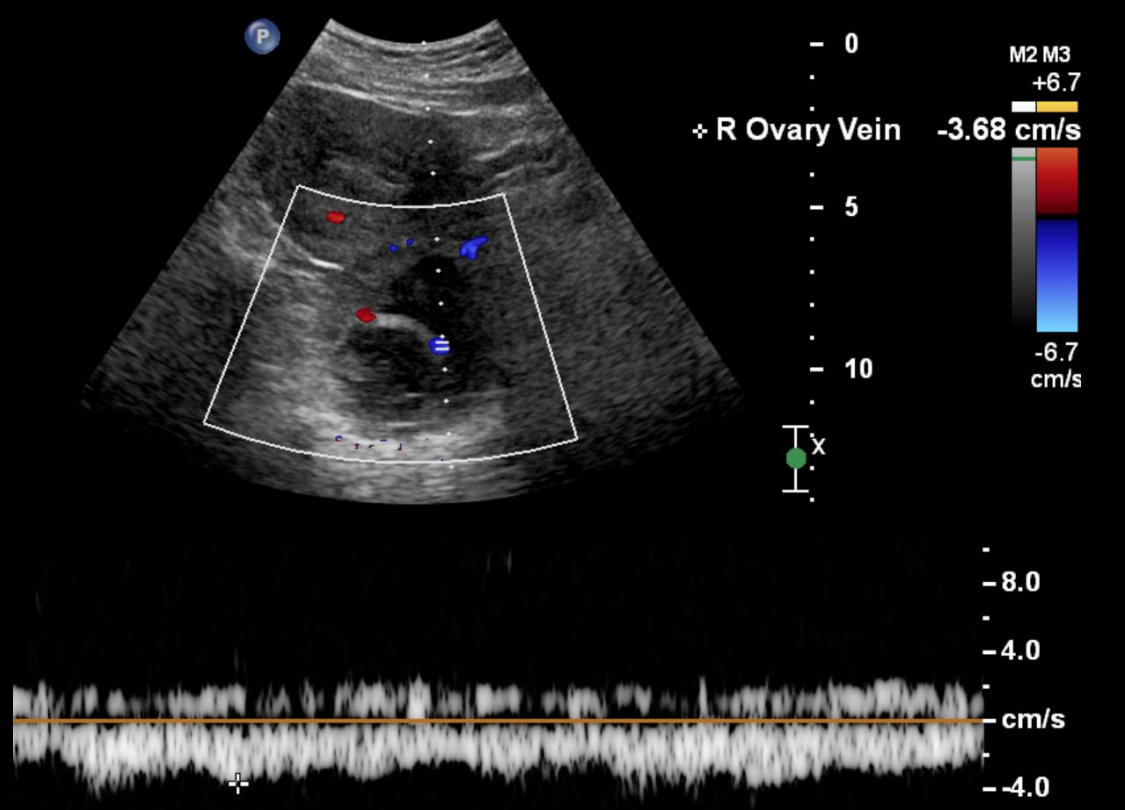
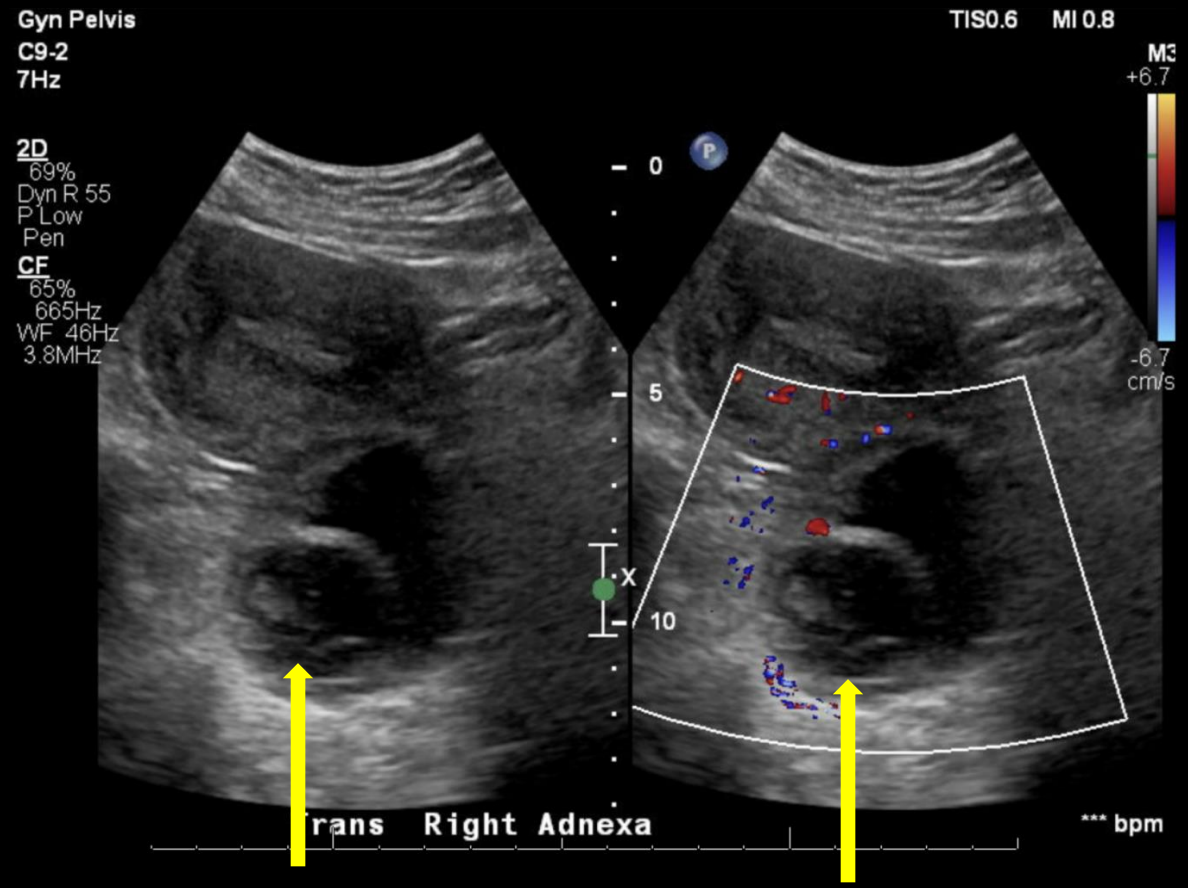


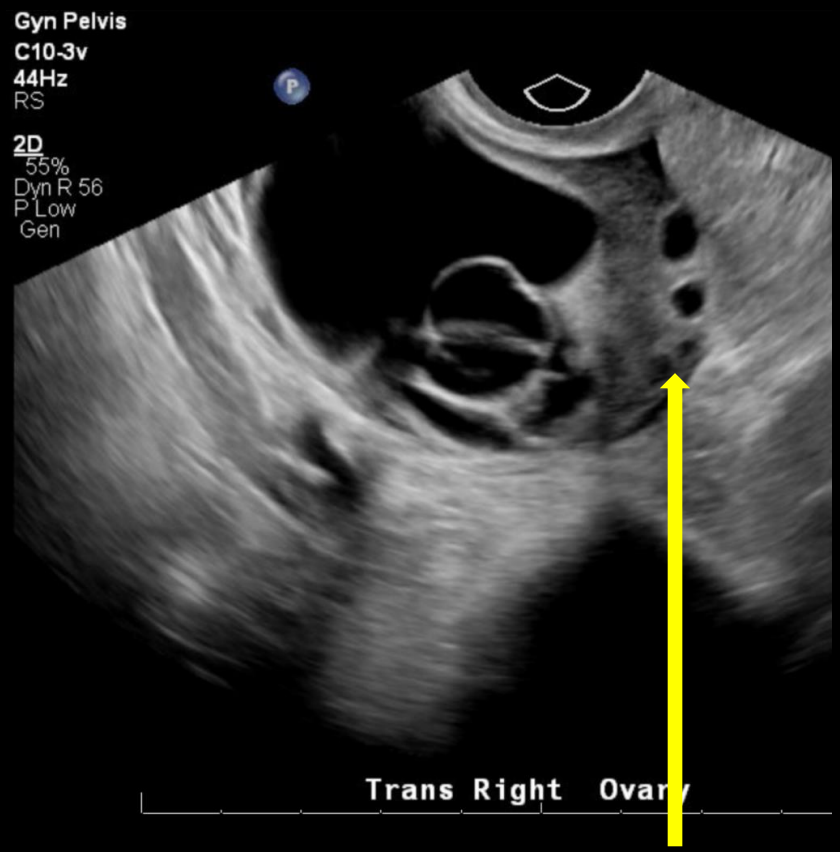


Findings (Labeled)



The right ovary is replaced by a 7 x 6 × 6 cm complex cyst with septations and a 3.5 cm hemorrhagic component.

The right ovary shows preserved vascularity with arterial and venous waveforms.



Edematous right ovary with peripheralization of follicles known as “string of pearls” sign.

Transabdominal and Transvaginal US

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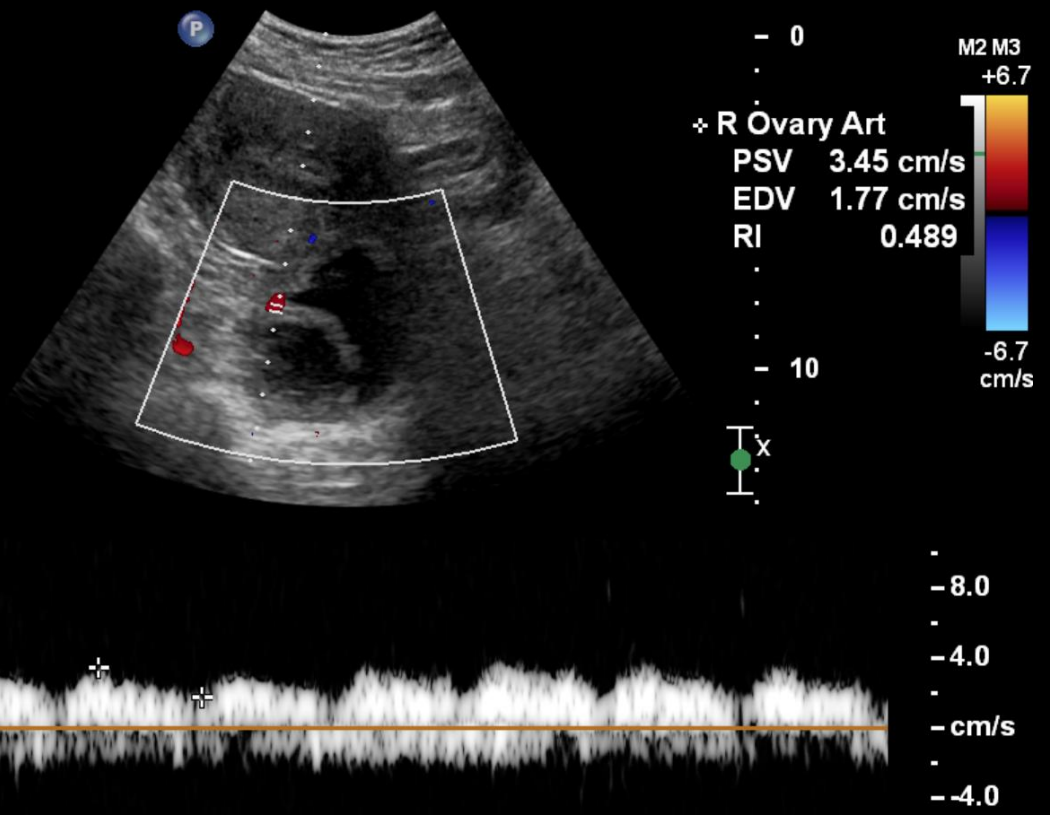
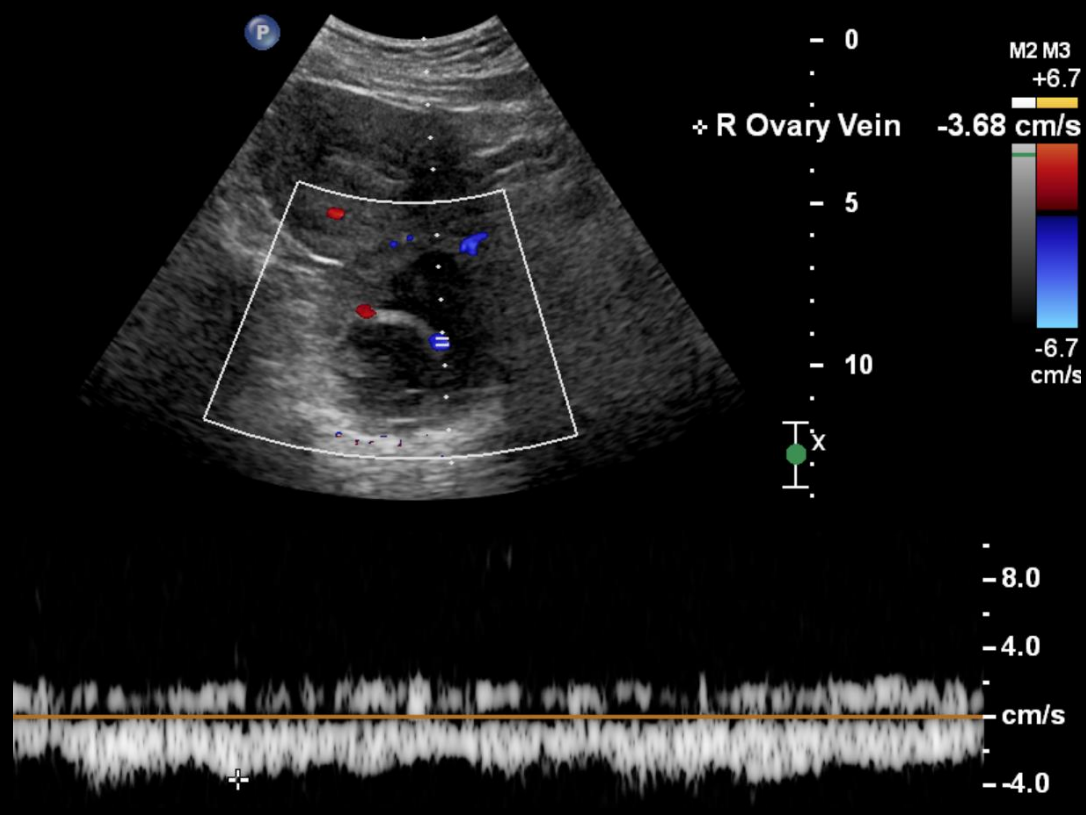
Findings (Labeled)



Appropriate waveform and directional flow of the ovarian artery.



Appropriate waveform and directional flow of the ovarian vein.

Transabdominal US

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Follow-Up

- Swirled appearance of the right adnexal structures leading to the right ovary on CT is consistent with acute right ovarian torsion.
- Arterial and venous waveforms on transvaginal ultrasound does not rule out ovarian torsion, but suggests that the ovary remains viable.
- Intraoperative findings revealed a bilobed right ovarian cyst, with two components measuring 3–4 cm each. Torsion was noted around the infundibulopelvic ligament. No evidence of ovarian necrosis was observed.
- The right ovary was successfully detorsed. One cyst contained serous fluid, while the second had hemorrhagic fluid.
- Pathology was consistent with multiseptated right ovarian cyst, mucinous cystadenoma, and hemorrhagic corpus luteum cyst.

Final Diagnosis:

Right Ovarian Torsion with Complex Ovarian Cyst

Case Discussion

- Definition: Adnexal torsion occurs when adnexal structures, most commonly the ovary, twist around the infundibulopelvic and utero-ovarian ligaments. This rotation can disrupt arterial, venous, and lymphatic flow, resulting in varying degrees of vascular compromise and potentially causing ovarian dysfunction.

- Epidemiology: Adnexal torsion ranks as the fifth most common gynecologic emergency, making up 2.7% of gynecologic surgical emergencies. It predominantly affects patients of reproductive age, with the average age of occurrence ranging from 29 to 33.5 years.

Case Discussion

- Risk factors:
  - Ovarian masses, prior pelvic surgery, ovulation induction, pregnancy

- Radiographic Features:
  - US/CT/MRI: Asymmetric ovarian enlargement, peripheralized follicles, adjacent free fluid, stromal hemorrhage, twisted vascular pedicle (“whirlpool sign”), abnormal ovarian location, uterine tilting
  - Doppler US: Presence of flow indicates viability, but does not exclude torsion

Case Discussion

- Differential Diagnosis:
  - Ectopic pregnancy, ruptured ovarian cyst, tubo-ovarian abscess, appendicitis
- Management of Acute Ovarian Torsion:
  - Viable ovary → detorsion
  - Nonviable ovary → salpingo-oophorectomy
- Management of Mucinous Cystadenoma:
  - Depends on factors like size, symptoms, and risk of malignancy
  - Surgical excision is the mainstay of treatment

References:

1. Laufer RM. Ovarian and fallopian tube torsion. In: Sharp H, ed. *UpToDate*. UpToDate; 2025. Accessed February 4, 2025. Available from: www.uptodate.com.
2. Limaiem F, Mlika M. Ovarian cystadenoma. In: *StatPearls*. StatPearls Publishing; 2023.
3. Moro F, Bolomini G, Sibal M, et al. Imaging in gynecological disease (20): clinical and ultrasound characteristics of adnexal torsion. *Ultrasound Obstet Gynecol.* 2020;56(6):934-943. doi:10.1002/uog.21981.
4. Strachowski LM, Choi HH, Shum DJ, Horrow MM. Pearls and pitfalls in imaging of pelvic adnexal torsion: seven tips to tell it's twisted. *Radiographics*. 2021;41(2):625-640. doi:10.1148/rg.2021200122

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