AMSER Case of the Month November 2025

41-year-old female with dysmenorrhea and infertility

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Patient Presentation

- 41-year-old G1P1001 female with history of infertility presenting with dysmenorrhea, intermenstrual spotting, and dyspareunia for several months
- No history of STIs, abnormal Pap smears, or cervical dysplasia/cancer
- Desires to have another child
- Physical exam notable for bilateral adnexal fullness and tenderness with no palpable masses
- Outside pelvic ultrasound from 2 months ago indeterminate with potential right-sided hemorrhagic cysts

What Imaging Should We Order?

ACR Appropriateness Criteria

Variant 2: **Adult. Clinically suspected pelvic endometriosis. Indeterminate or negative ultrasound. Next imaging study for characterization or treatment planning.**

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

This imaging modality was ordered by the OBGYN physician

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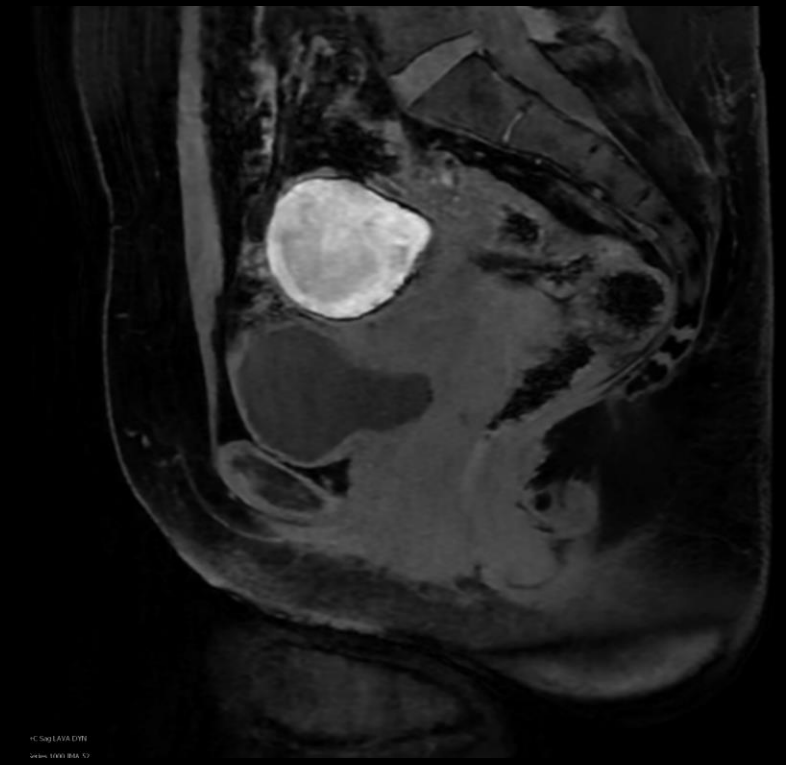
Findings (unlabeled)

Axial T1
Fat-suppressed



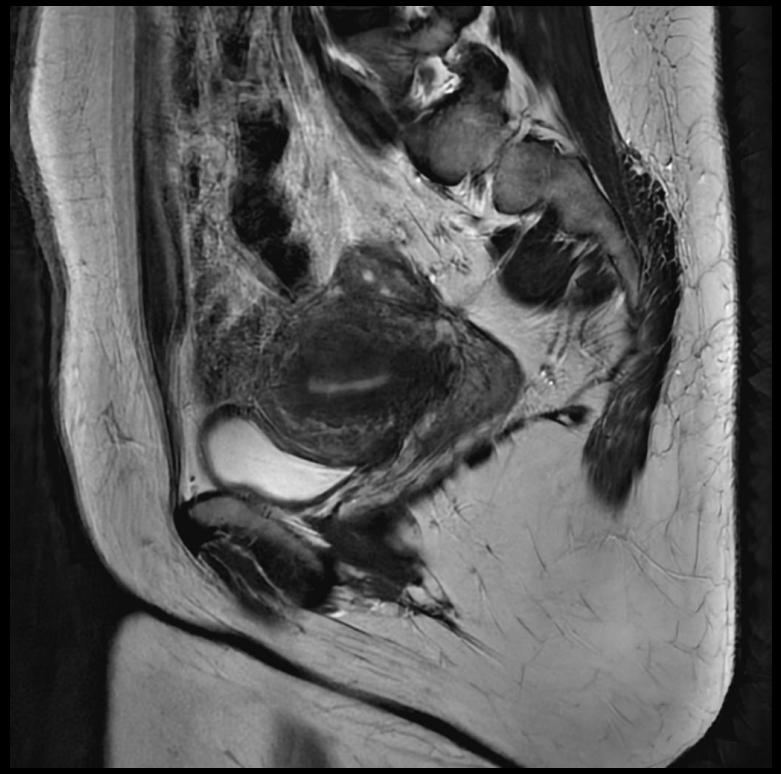
Sagittal T1
Fat-suppressed

Findings (unlabeled)

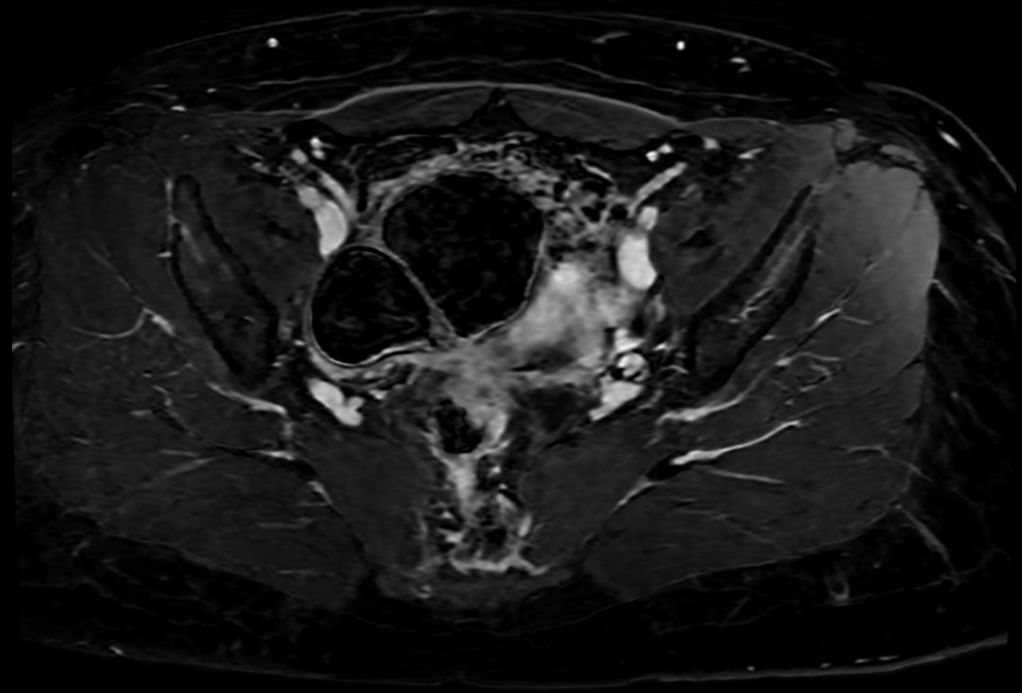
Axial T2
Non-fat-suppressed

Sagittal T2
Non-fat-suppressed

Findings (unlabeled)

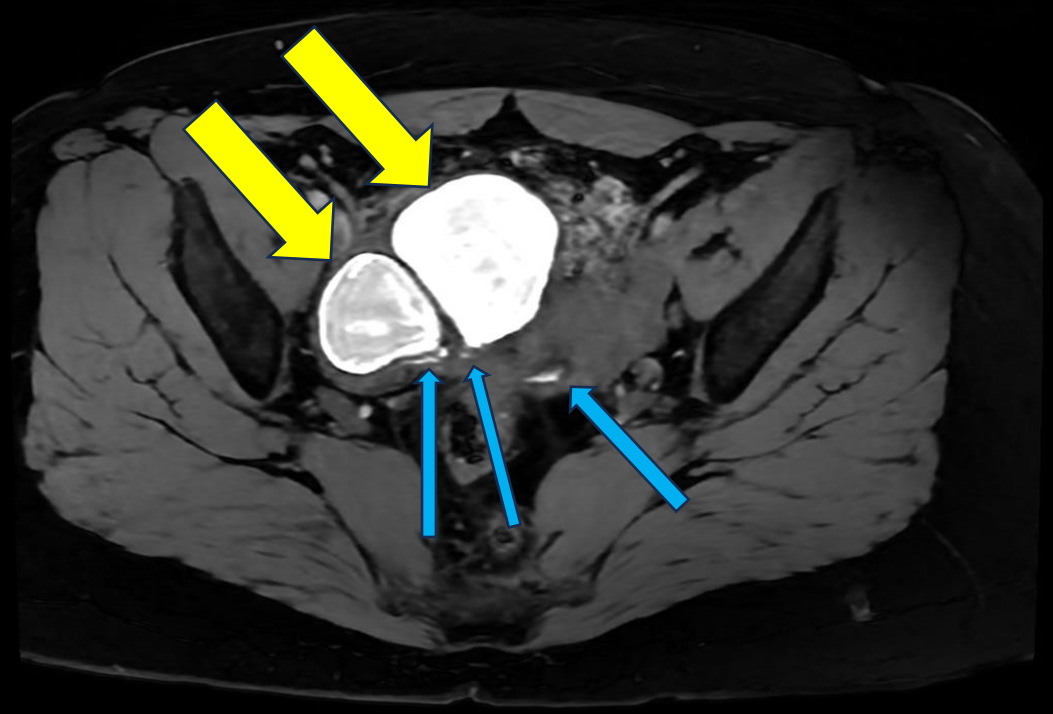


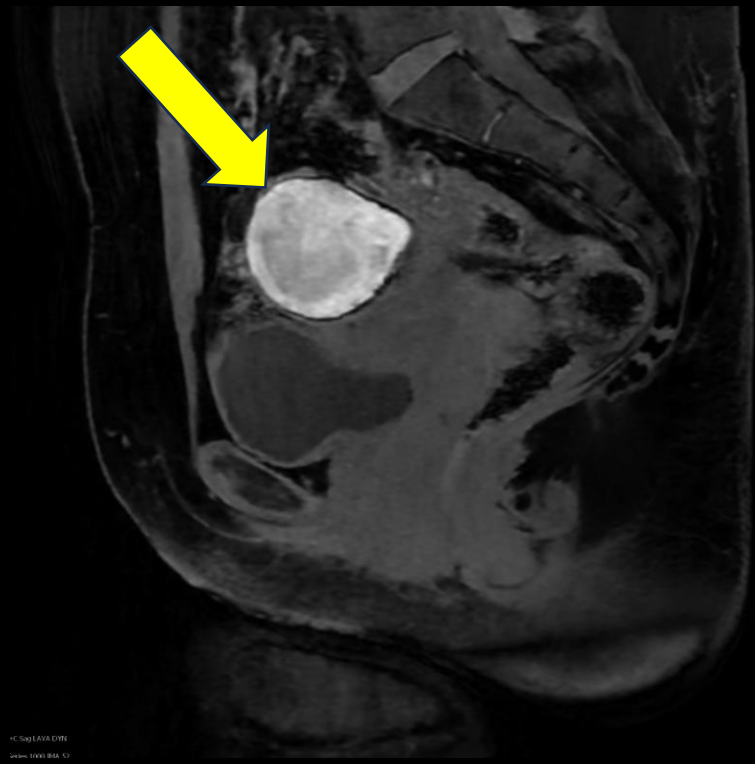
Sagittal T2
Non-fat-suppressed



Axial T1
Post-contrast

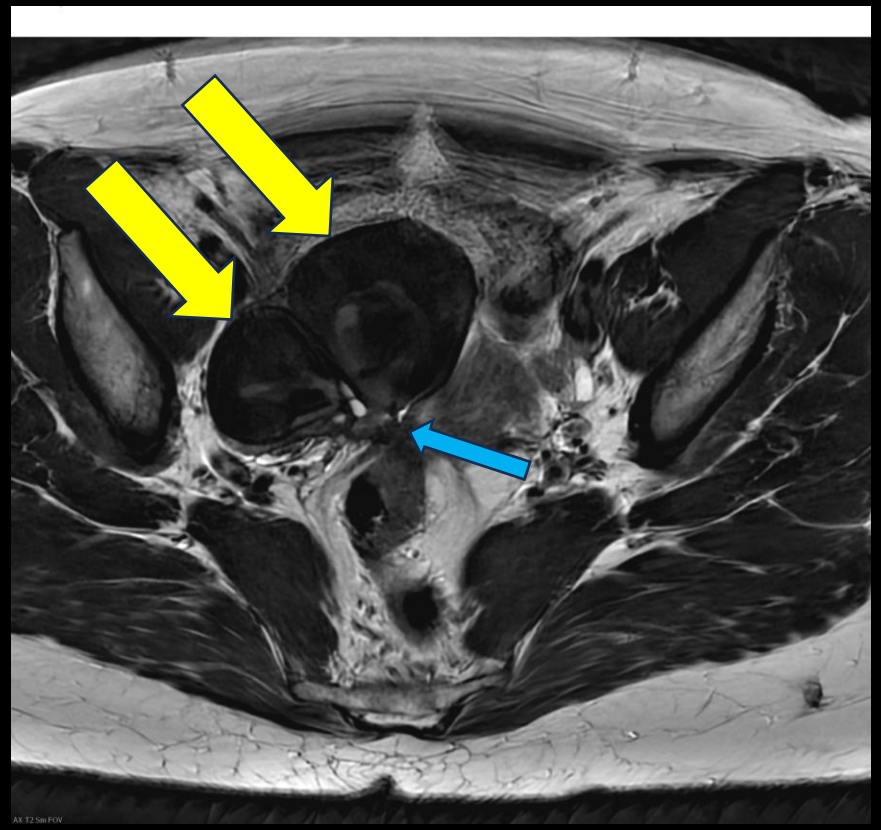
Findings (labeled)





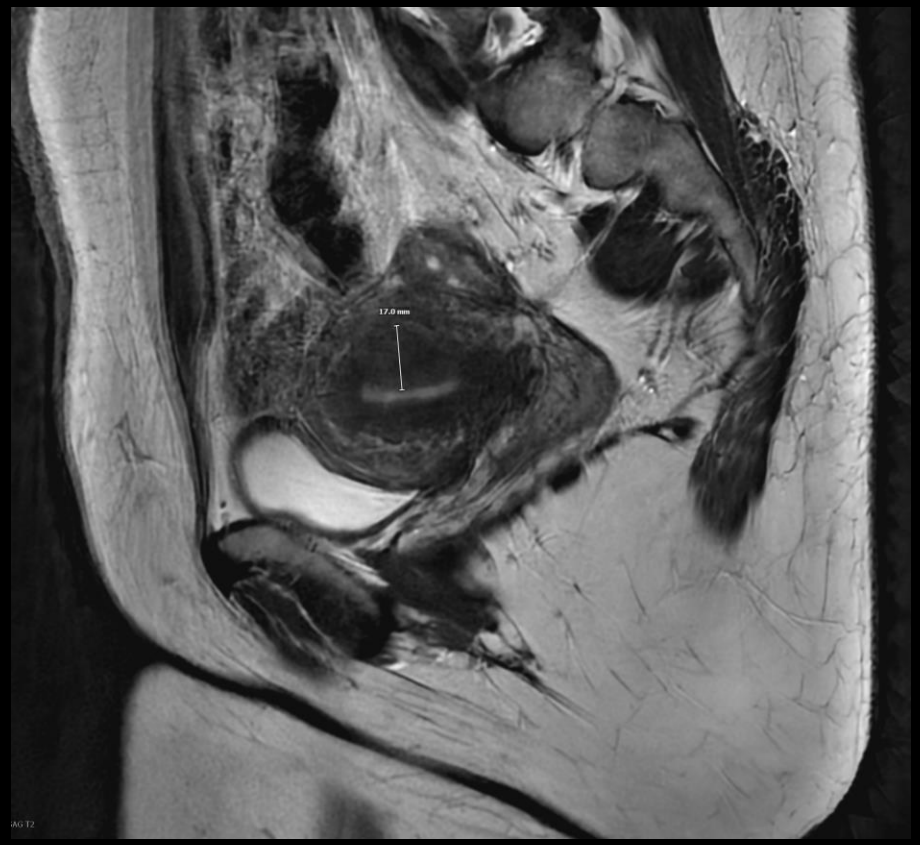
Axial and sagittal T1 fat-suppressed images show two right-sided ovarian hyperintense lesions (yellow arrows) with scattered, hyperintense foci along the posterior uterine serosa (blue arrows).

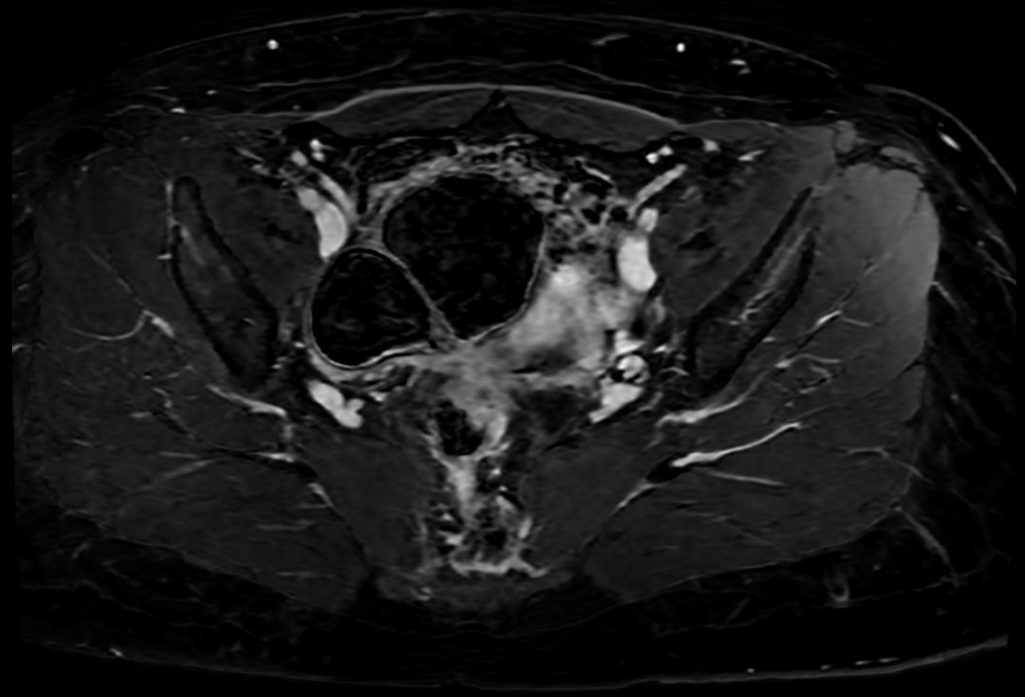
Findings (labeled)



Axial and sagittal T2 non-fat-suppressed images show two ovarian hypointense and tethered lesions (yellow arrows) with sigmoid tethering (blue arrow).

Findings (labeled)





Sagittal T2 non-fat-suppressed shows thickened junctional zone (17 mm) within the uterus. Axial T1 post-contrast shows no internal enhancement of the two right-sided lesions.

Final Dx:

Deep Pelvic Endometriosis

Case Discussion

- Endometriosis is a chronic condition where uterine-like tissue grows outside the uterus, appearing in forms ranging from superficial lesions to deep nodules and endometriomas
- Frequently associated with adenomyosis, a similar condition where endometrial tissue is found in uterine muscle
- Epidemiology
  - Commonly seen in young women with risk factors of family history of the disease and short menstrual cycles
- Pathophysiology
  - Main theories include retrograde menstruation, metaplastic transformation, and induction[1]
- Clinical Presentation
  - Pelvic pain, dysmenorrhea, dyspareunia, and infertility in up to 50% of patients[2]
- Diagnostic imaging
  - Ultrasound is typically first-line on initial presentation but quality of exam is inconsistent
    - Sensitivities and specificities vary greatly (10-100%) across different pelvic sites and are also heavily influenced by operator technique[3]
    - Limits practicality and usefulness of ultrasound for definitive diagnosis of deep endometriosis
  - MRI offers superior tissue differentiation from other pelvic masses and lesions

Case Discussion

- MRI review and findings
  - T1 bright lesions include fat, blood, melanin, calcium, and contrast
    - Endometriomas appear hyperintense on T1 due to chronic blood products[4]
    - Deep nodules and implants are also hyperintense and commonly involve the rectovaginal septum, uterus, pouch of Douglas, GI tract, and uterosacral ligaments
  - T2 hypointense lesions of ovaries include endometrioma, Brenner tumor, fibroma, and Krukenberg tumor
    - Shading sign describes T1-bright lesions that become dark on T2 and is specific for endometrioma[5]
  - Internal enhancement: on post-contrast imaging, endometriomas typically do not enhance
    - An enhancing mural nodule is suggestive of malignant transformation[6]
  - Adhesions and tethering form due to chronic scarring and fibrosis
    - Commonly involve ovaries, uterus, bowel, and bladder
  - Adenomyosis commonly seen with deep endometriosis[7]
    - Findings include thickened junctional zone of uterus ≥ 12 mm

Case Discussion

- Treatment
  - Medical management is first-line for controlling pain[8]
    - Oral contraceptives and GnRH analogs to suppress or control menstrual cycle
  - Laparoscopic surgery for patients with severe symptoms and to preserve fertility
    - Otherwise hysterectomy and oophorectomy
- Key takeaway points
  - Endometriosis can involve many pelvic organs and manifests as endometriomas, superficial disease, and deep infiltrating nodules/implants
  - Ultrasound and MRI are first-line imaging with MRI providing better characterization of indeterminate and deep lesions, ovarian masses, and malignancy risk
  - As seen in this case, adenomyosis is associated with deep endometriosis

References:

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4. Umaria N, Olliff JF. Imaging features of pelvic endometriosis. Br J Radiol. 2001;74(882):556-562. doi:10.1259/bjr.74.882.740556
5. Glastonbury CM. The shading sign. Radiology. 2002;224(1):199-201. doi:10.1148/radiol.2241010361
6. Tsili AC, Argyropoulou MI, Koliopoulos G, Paraskevaidis E, Tsampoulas K. Malignant transformation of an endometriotic cyst: MDCT and MR findings. J Radiol Case Rep. 2011;5(1):9-17. doi:10.3941/jrcr.v5i1.435
7. Vercellini P, Viganò P, Bandini V, Buggio L, Berlanda N, Somigliana E. Association of endometriosis and adenomyosis with pregnancy and infertility. Fertil Steril. 2023;119(5):727-740. doi:10.1016/j.fertnstert.2023.03.018
8. Brown J, Farquhar C. Endometriosis: an overview of Cochrane Reviews. Cochrane Database Syst Rev. 2014;2014(3):CD009590. Published 2014 Mar 10. doi:10.1002/14651858.CD009590.pub2

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