AMSER Case of the Month July 2025

14-year-old female with 4-week history of worsening abdominal pain

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Inland Imaging

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Patient Presentation

- HPI:
- 14-year-old female with 4-week history of progressively worsening lower abdominal pain that comes and goes. Particularly worse in the last two days.
- Alternating diarrhea and hard, pellet like stools
- Patient was evaluated 3 weeks prior in urgent care for same complaints and prescribed acetaminophen, ibuprofen, and bismuth subsalicylate, with reported mild relief of discomfort
- She has never had a menstrual period

- PMH:
  - Celiac disease, lactose intolerance
  - Pattern of holding in stool and urine due to refusal to use public restrooms. Alleviates self at home
- Surgical Hx: None
- Physical exam:
  - Mild tenderness to palpation in supra-pubic region
  - No guarding or rebound

Pertinent Labs

- Urinalysis from urgent care 3 weeks prior to ER presentation: Negative
- Day of presentation to ER:
  - Serum WBC: 14,690
  - Serum electrolytes, CBC, renal function: within normal limits
  - B-hCG: Negative

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria [1]

Variant 2: **Acute pelvic pain in the reproductive age group. Gynecological etiology suspected, β-hCG negative (either serum or urine). Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
US duplex Doppler pelvis	Usually Appropriate	O
US pelvis transabdominal	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 abdomen and pelvis with IV contrast	May Be Appropriate	☢☢☢
MRI abdomen and pelvis without and with IV contrast	Usually Not Appropriate	O
MRI abdomen and pelvis without IV contrast	Usually Not Appropriate	O
CT abdomen and pelvis without IV contrast	Usually Not Appropriate	☢☢☢
CT pelvis with IV contrast	Usually Not Appropriate	☢☢☢
CT pelvis without IV contrast	Usually Not Appropriate	☢☢☢
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢

This imaging modality was ordered by the ER physician

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Select the applicable ACR Appropriateness Criteria [1]

Variant 4: **Acute pelvic pain in the reproductive age group. Nongynecological etiology suspected, β-hCG negative (either urine or serum). Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
US abdomen and pelvis transabdominal	Usually Appropriate	O
US duplex Doppler pelvis	Usually Appropriate	O
US pelvis transvaginal	Usually Appropriate	O
CT abdomen and pelvis with IV contrast	Usually Appropriate	☢☢☢
CT abdomen and pelvis without IV contrast	Usually Appropriate	☢☢☢
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate (Disagreement)	O
MRI abdomen and 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 abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢

This imaging modality was ordered by the ER physician

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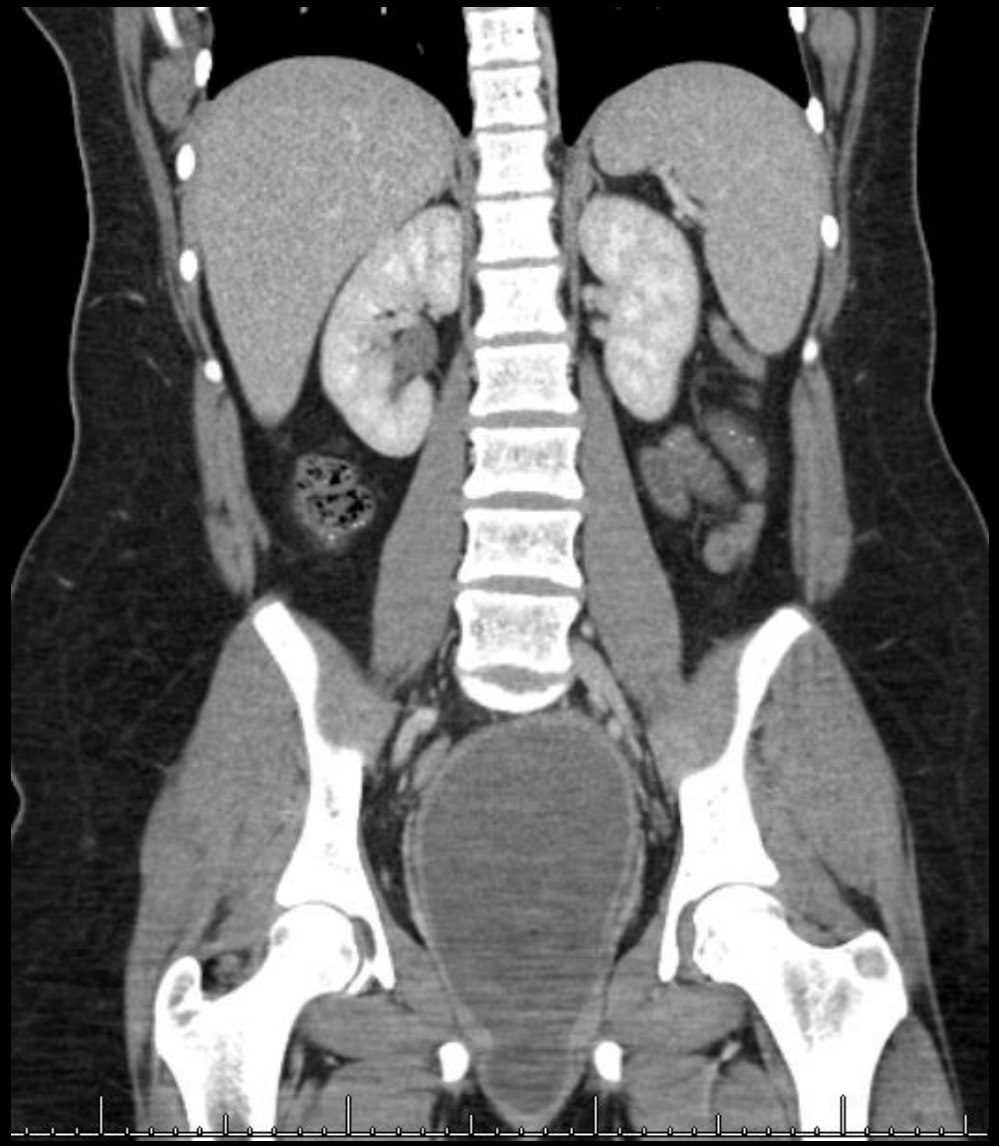
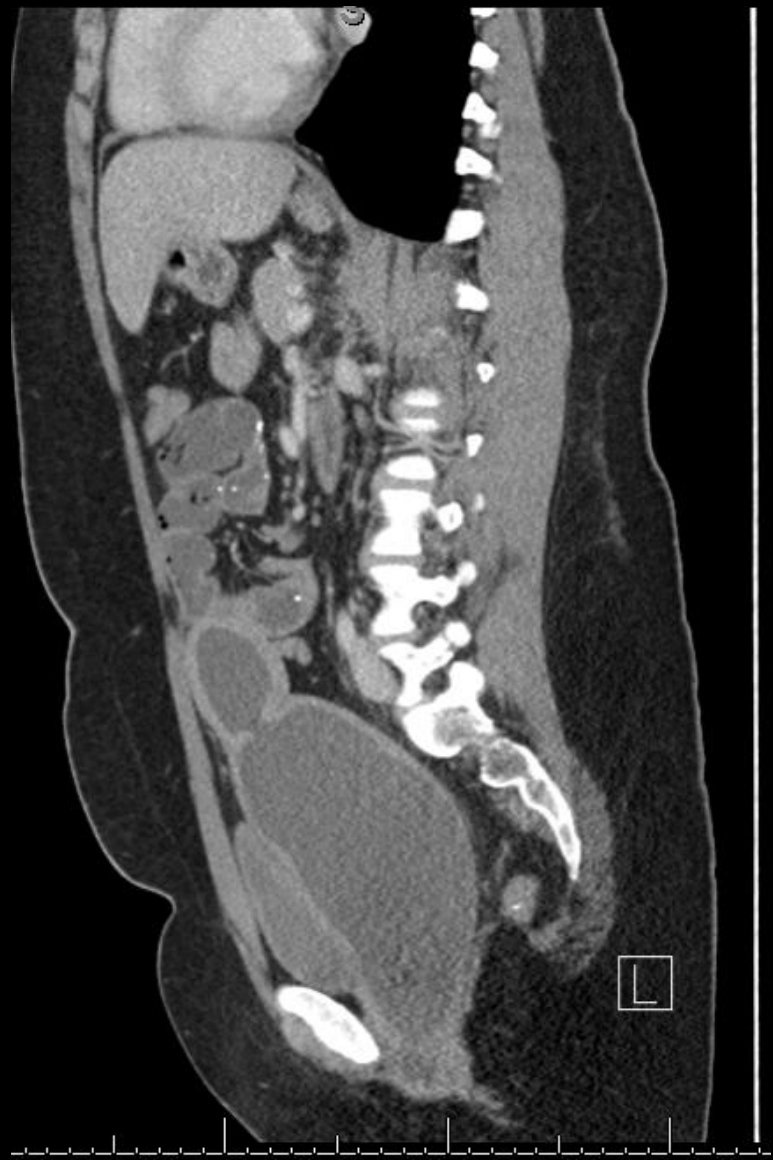
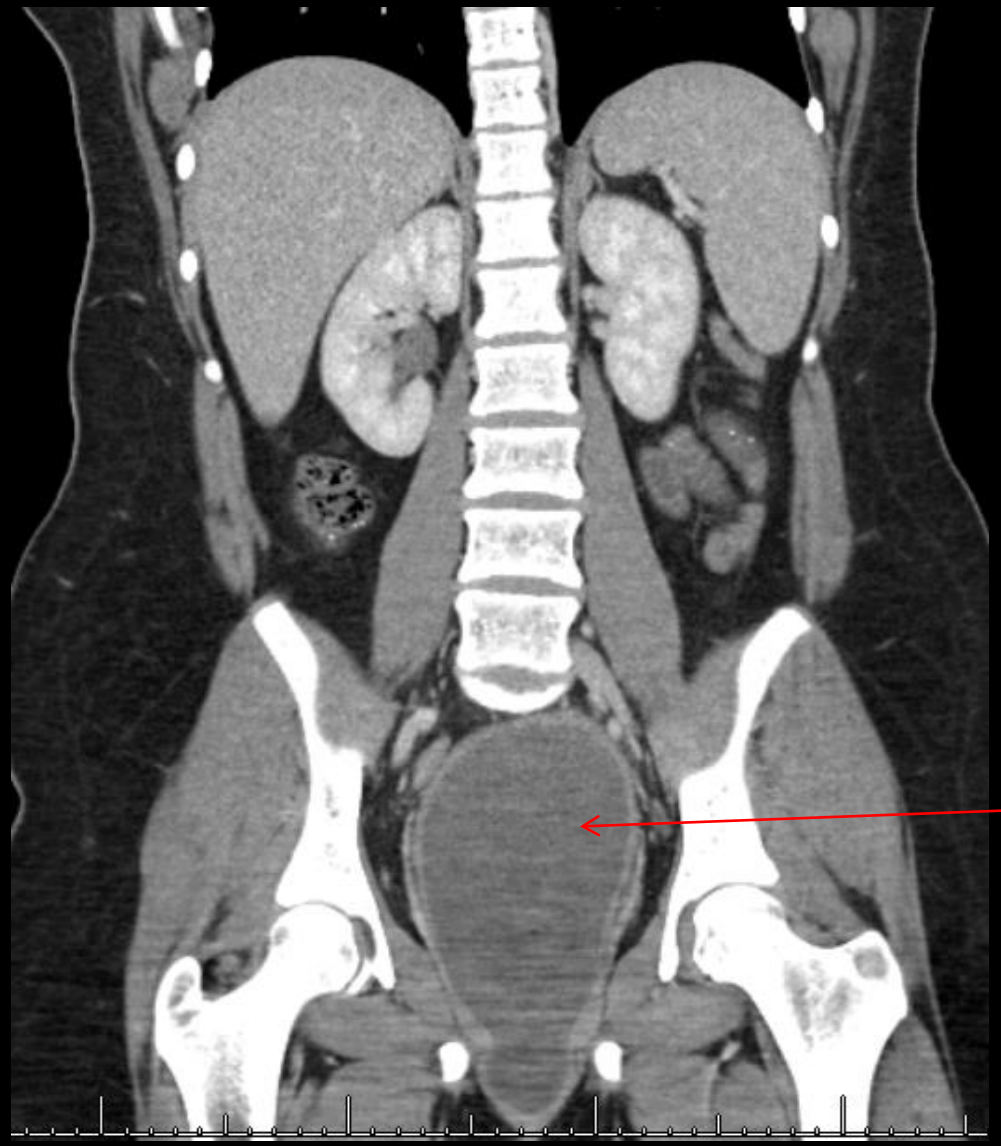
Findings (Unlabeled)





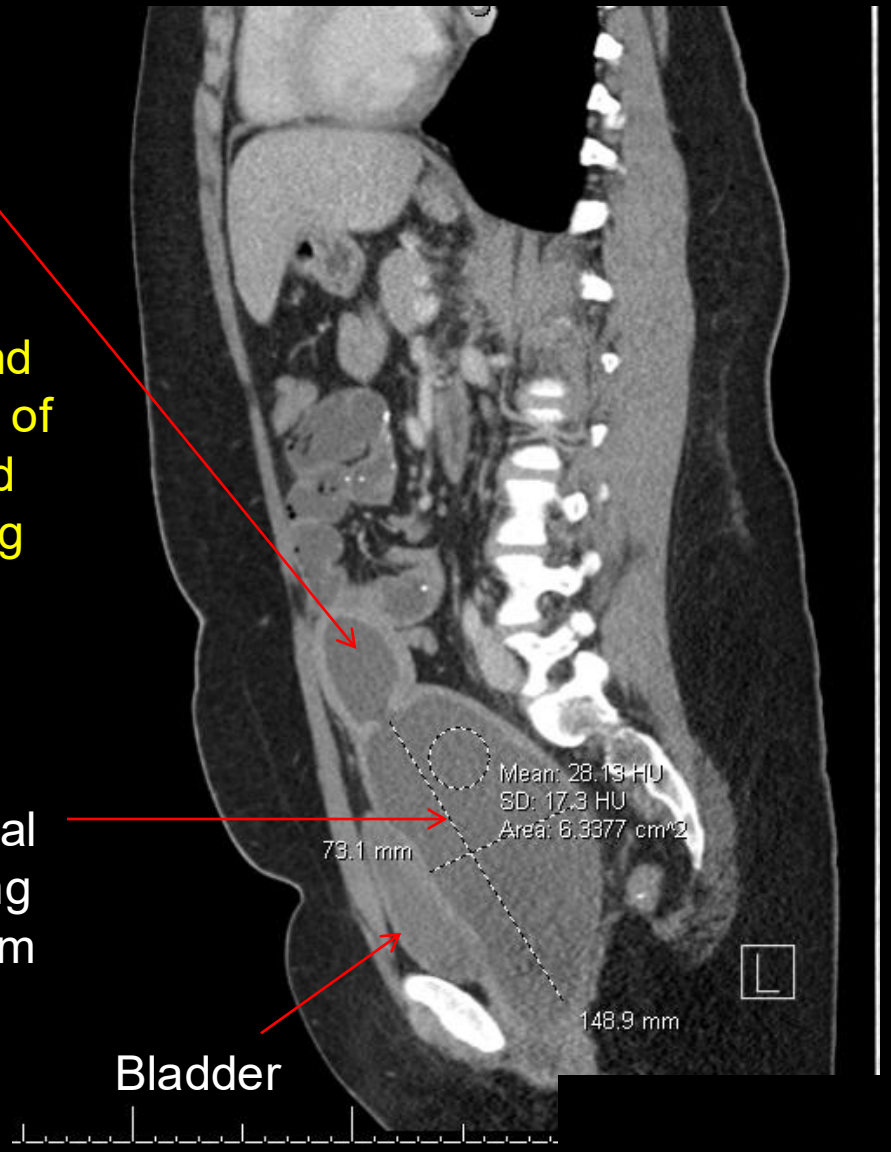
Findings (Labeled)



Markedly distended uterus

Intra vaginal and uterine contents of +28 Hounsfield units* indicating blood

Markedly distended vaginal cavity measuring 7.3mm x 14.9mm



Bladder

*Hounsfield units[1]
-Blood: +13 - +75
-Water: 0

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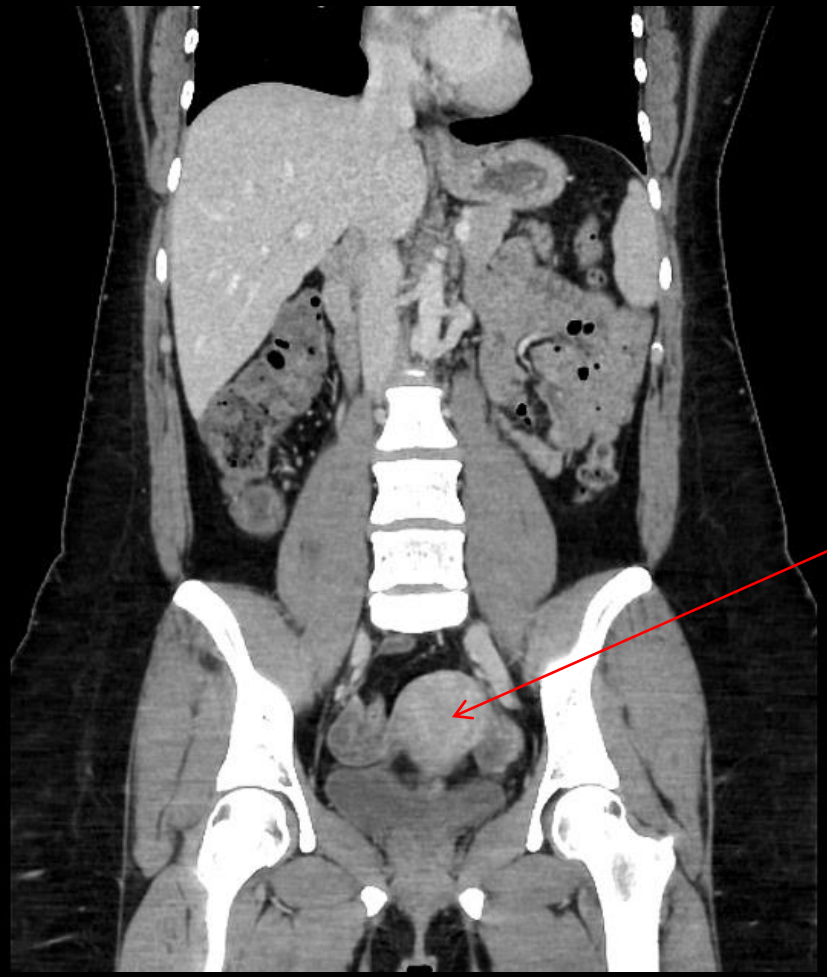
Normal Female Anatomy for Comparison



Normal sized uterus
without distension

Vaginal canal
without distension

Comparison images from Radiopaedia.org

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Final Dx:

Hematometrocolpos secondary to imperforate hymen

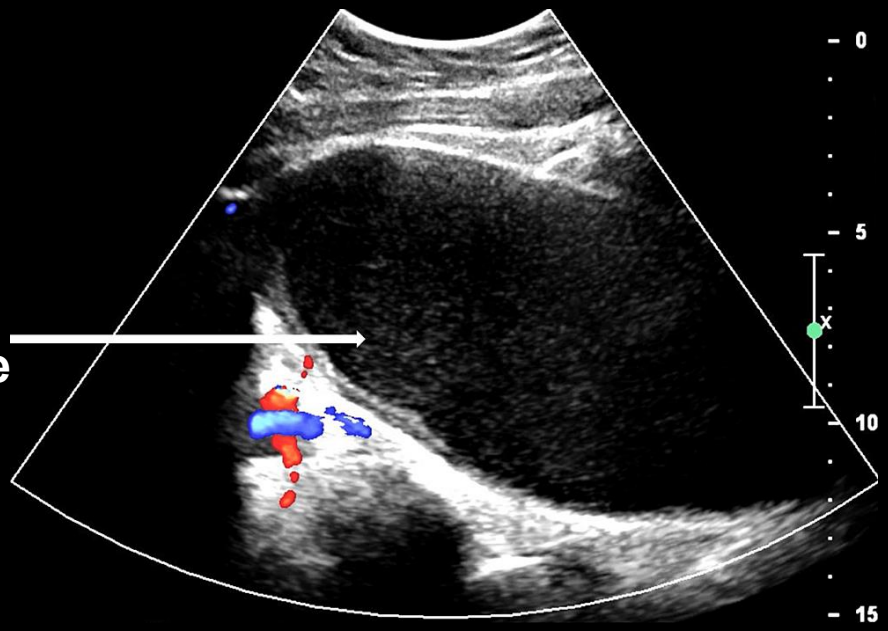
Discussion

- Definition: Hematometrocolpos is the accumulation of blood in the vaginal and uterine cavities[2]. Although rare, it is most often due to imperforate hymen[3]. Other causes include transverse vaginal septum and vaginal stenosis[4]
- Epidemiology: Incidence of hematometrocolpos is approximately 1 in 1,000-2,000 in the adolescent population[5]

Discussion

- Clinical presentation: Lower abdominal pain that is often cyclical in nature in teenagers not yet having experienced menarche. Case reports often describe accompanying symptoms of back pain, nausea, diarrhea or constipation, and dysuria [4, 6] Ultrasound would reveal a distended uterus.

Longitudinal orientation of the distended uterus containing a large amount of hypoechoic blood products (white arrow)[8] shown on ultrasound



Example of ultrasound findings in hematometrocolpos. Photo Credit: Asikhia et al.

Discussion

- Diagnosis: MRI would show distended vaginal and uterine cavities with hyperintense findings on T1 and T2[4] exemplified below.

In these example images, the red arrows indicated a markedly distended vaginal cavity demonstrated on sagittal views in T1 (left) and T2 (right) – weighted images.

High intensity fluid in these sequences is consistent with blood[9]

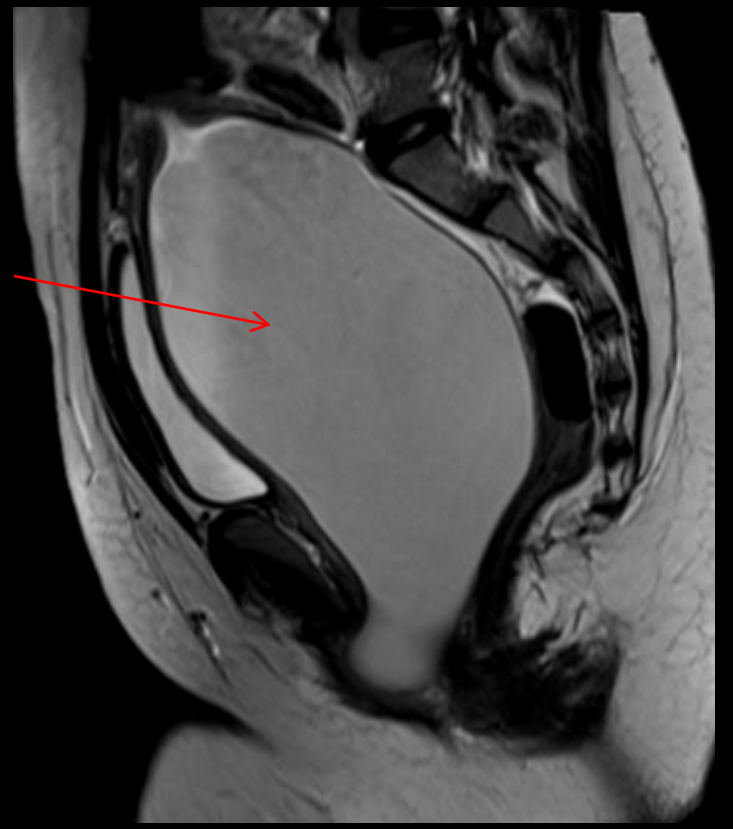


Image Credit: Radiopaedia.org[9]

Discussion

- Treatment: The patient underwent a hymenotomy

- Surgical pathology results:
  - Hymenal tissue with mildly reactive squamous mucosa and unremarkable glandular mucosa
  - Submucosal vascular congestion and reactive changes
  - Negative for dysplasia, neoplasia and significant inflammation

References:

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3. Bakacak M, Avci F, Bostanci MS, et al. Management of hematometrocolpos due to dysfunctional uterine bleeding following progestin use: a case report. *North Clin Istanb*. doi:10.14744/nci.2014.32932
4. Kotter HC, Weingrow D, Canders CP. Hematometrocolpos in a Pubescent Girl with Abdominal Pain. *Clin Pract Cases Emerg Med*. doi:10.5811/cpcem.2017.3.33369
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References:

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7. M P N, Anwar L. A Case Report of Hematometrocolpos in Two Adolescents: Divergent Clinical Presentations and Diagnostic Challenges. *Cureus*. doi:10.7759/cureus.67675
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