AMSER Rad Path Case of the Month:

Mature Cystic Teratoma

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Patient Presentation

- A 56-year-old postmenopausal woman presents to clinic for 12 months of daily vaginal spotting. She feels otherwise well. Physical exam does not show any abnormalities.

- Pertinent Labs:
  - Pap: negative
  - HPV: negative
  - CEA: normal
  - CA-125: normal
  - Inhibin A/B: normal

What Imaging Should We Order?

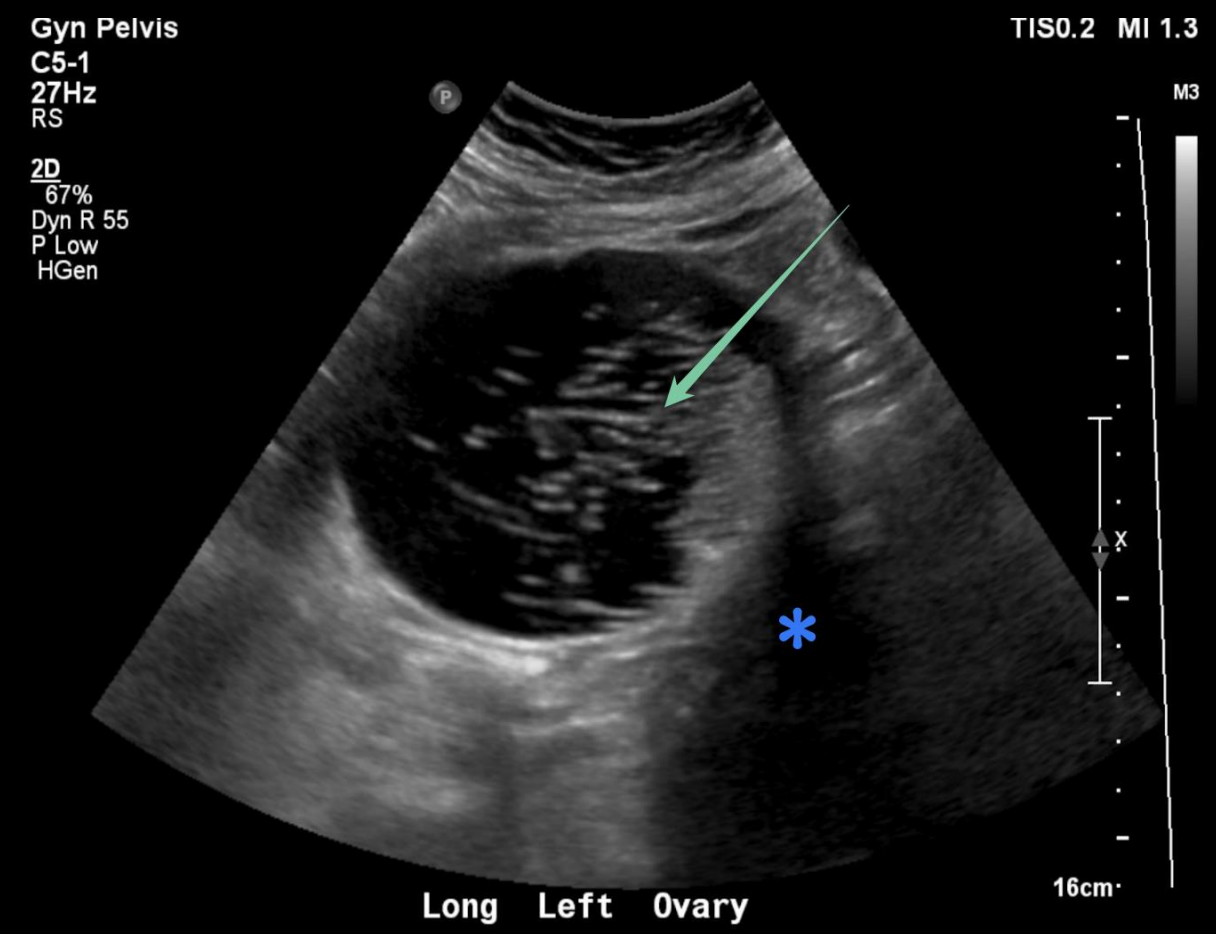
American College of Radiology
ACR Appropriateness Criteria®
Abnormal Uterine Bleeding

Variant 1: **Abnormal uterine bleeding. 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
US sonohysterography	May Be Appropriate (Disagreement)	O
MRI pelvis without and with IV contrast	Usually Not Appropriate	O
MRI pelvis without IV contrast	Usually Not 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	☢☢☢☢

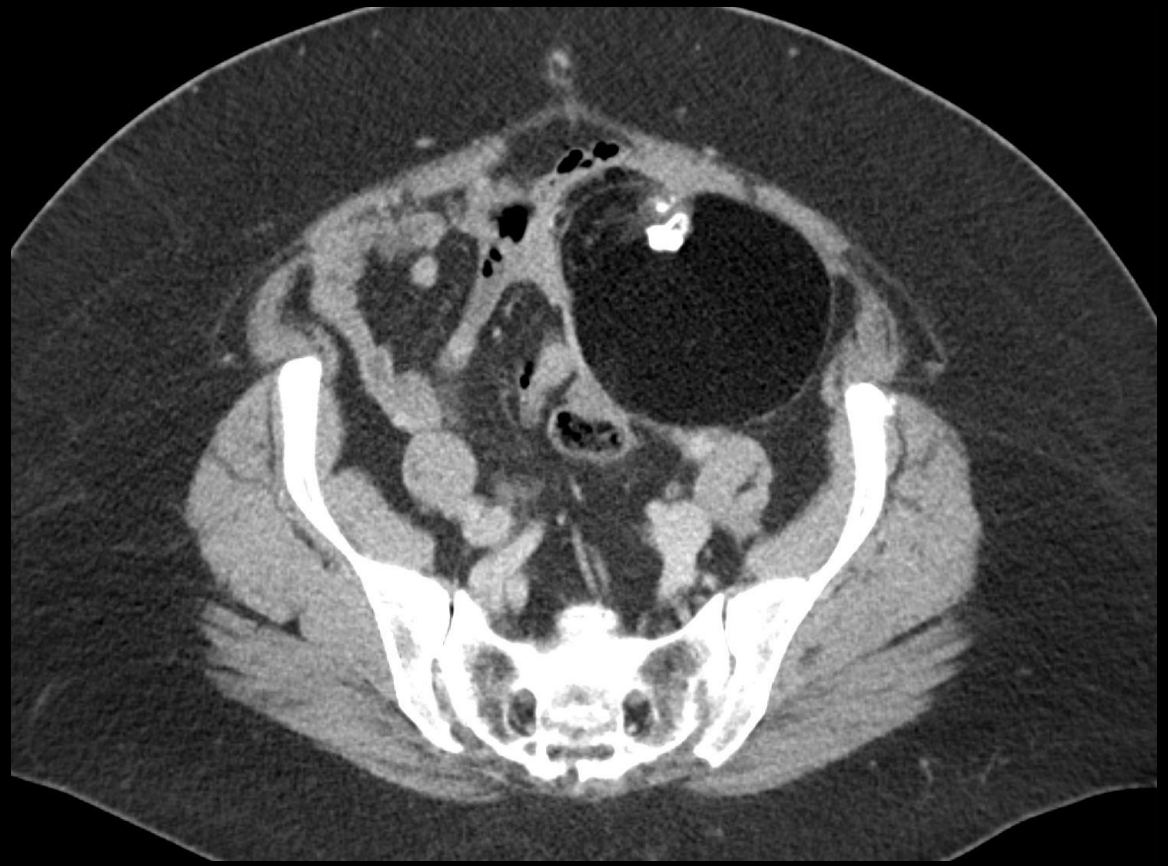
US pelvis transabdominal (unlabeled)

US pelvis transabdominal (labeled)



Partially echogenic left adnexal mass with **shadowing** and **multiple thin floating echogenic densities**.

CTAP with IV contrast (unlabeled)



Axial

Coronal

CT was ordered by physician to confirm presence of macroscopic fat

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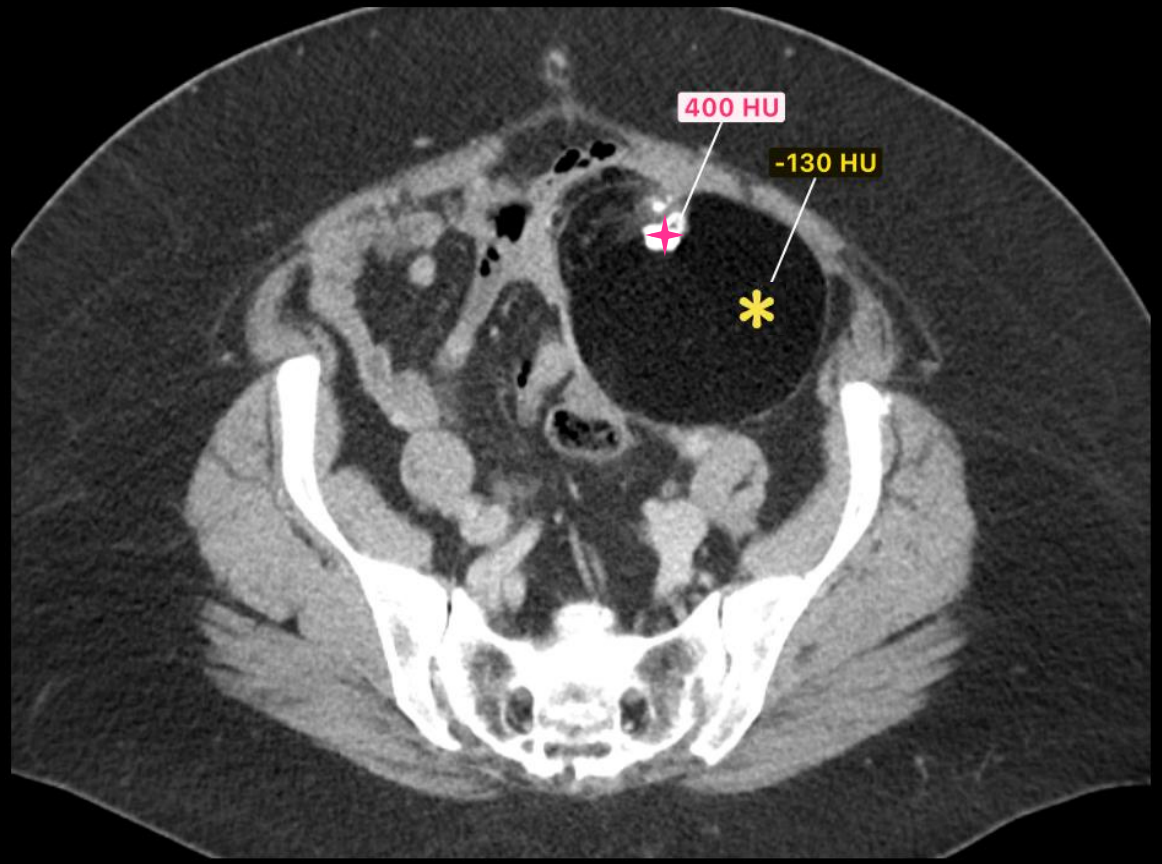
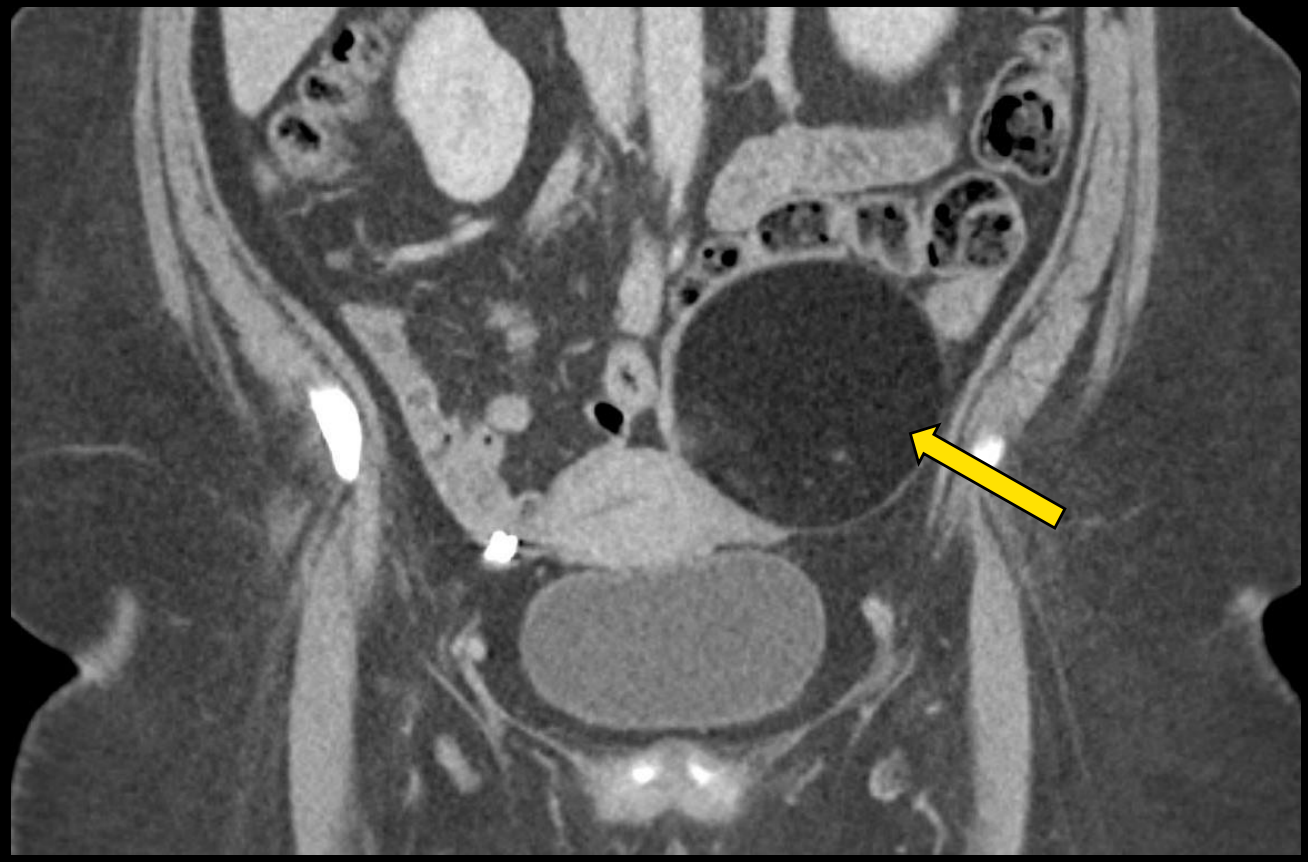
CTAP with IV contrast (labeled)





Mixed density left adnexal lesion containing **macroscopic fat (-130 HU)** and **calcified lesion (400 HU)**

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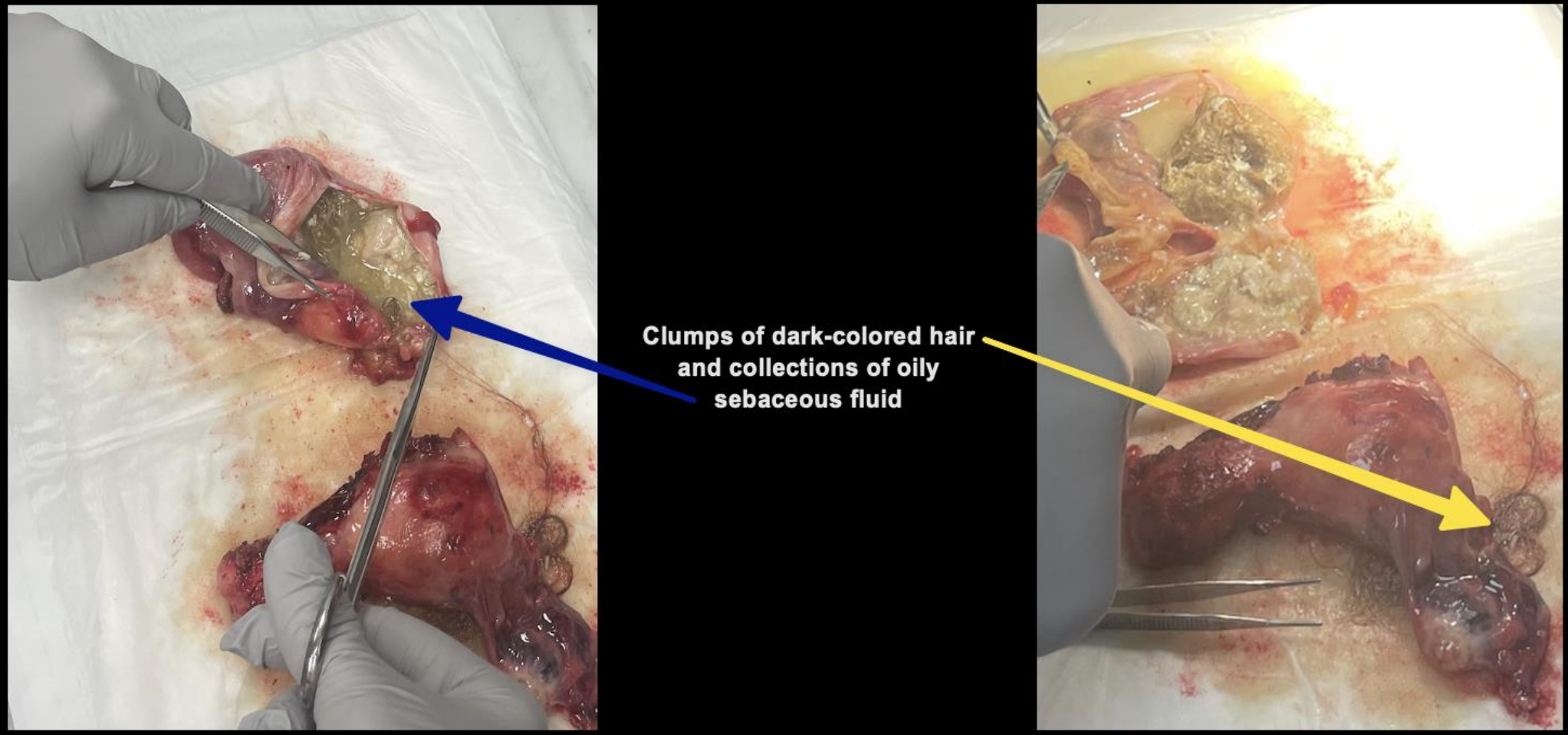
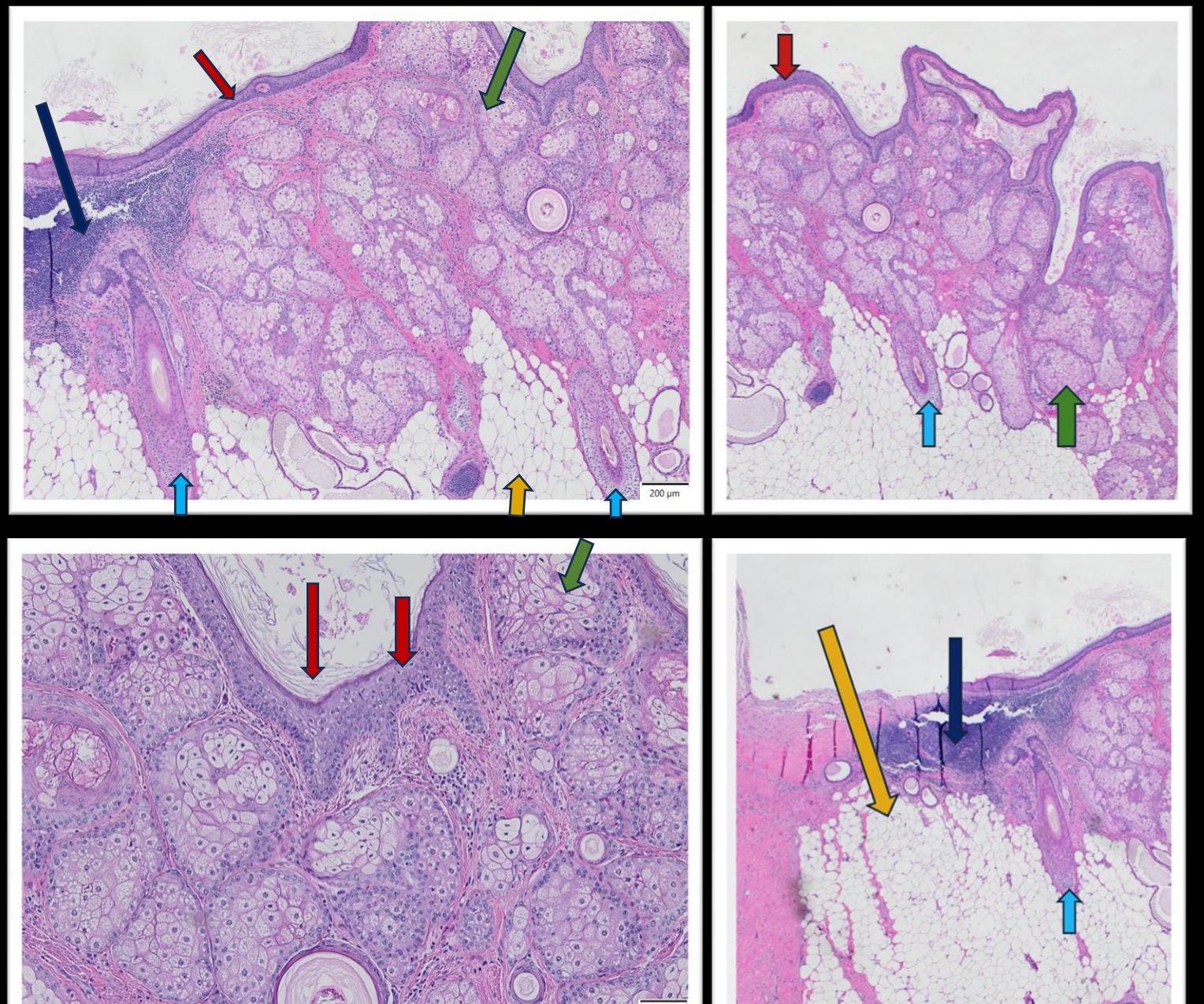
Differential Diagnoses

1. Mature ovarian cystic teratoma
2. Ovarian dermoid cyst
3. Germ cell tumor

Gross Images after Resection



Histopathology



Ectodermal:

Skin:

Squamous epithelium with keratinous debris

With adnexa:

Hair follicle

Sebaceous glands

Mesodermal:

Adipose tissue

Lymphoid tissue

Diagnosis: Mature cystic teratoma

Definition: Benign germ cell tumor composed of mature tissues derived from 2 or 3 germ cell layers (ectoderm, endoderm, mesoderm)

Final Dx:

Mature Cystic Ovarian Teratoma

Mature Cystic Teratoma

- *Pathology*
  - Benign germ cell tumor containing mature tissue elements from at least 2 of the 3 germ cell layers (ectoderm, mesoderm, endoderm)
  - While the terms ‘ovarian dermoid cyst’ and ‘mature ovarian cystic teratoma' are often used interchangeably, they are histologically distinct:
    - Dermoid cyst contains ectodermal elements only
    - Mature cystic teratoma is defined by the additional presence of mesodermal or endodermal elements
- *Epidemiology*
  - Accounts for 10-20% of all ovarian neoplasms
  - Most common ovarian tumor in women under 30
- *Clinical Presentation*
  - Typically asymptomatic & often discovered incidentally on imaging
  - May present with acute pelvic pain in cases complicated by ovarian torsion or rupture
  - Rarely, malignant transformation can occur

Mature Cystic Teratoma

- *Typical Features*
  - Location – typically unilateral (bilateral in 10-15% of cases)
  - Size – diameter typically < 10cm
  - Composition – can contain fat, sebum, hair, sweat glands, teeth, bone, nails, cartilage, thyroid tissue, etc.
- *Radiologic Appearance*
  - US – cystic adnexal mass with mural components
  - CT – fat, fat-fluid level, calcification, mural nodule
- *Management*
  - Symptomatic → surgical resection
  - Large (>7cm) → surgical resection
  - Asymptomatic and <7cm → annual follow-up to monitor growth

References:

- Multimodality Imaging Approach to Ovarian Neoplasms with Pathologic Correlation. Erin C. Taylor, Lina Irshaid, and Mahan Mathur. RadioGraphics 2021 41:1, 289-315.
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