

# AMSER Rad Path Case of the Month:

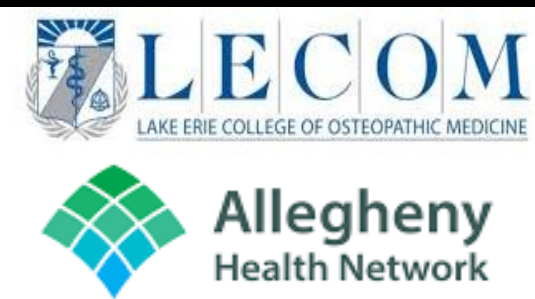
51 year old with abdominal distention

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# Patient Presentation

- 51 year old G0P0 female with a history of endometriosis presenting with acute onset abdominal pain/distention.
- Past surgical history significant for supracervical hysterectomy with removal of a benign pelvic mass 11 years ago
- Recent colonoscopy 2 months ago reported normal
- Abdomen exam notable for diffuse distention and positive fluid wave. No rebound tenderness or guarding. Unable to appreciate any distinct abdominal or adnexal masses
- Nonsmoker and does not drink alcohol

# Pertinent Labs

- WBC 14.3
- CEA 4.3
- CA-125 466

What imaging should we order?

# ACR Appropriateness Criteria

**Variant 4:** Acute nonlocalized abdominal pain. Not otherwise specified. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
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	Usually Appropriate	○
US abdomen	May Be Appropriate	○
MRI abdomen and pelvis without IV contrast	May Be Appropriate	○
CT abdomen and pelvis without and with IV contrast	May Be Appropriate	⊕⊕⊕⊕
Radiography abdomen	May Be Appropriate	⊕⊕
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	⊕⊕⊕⊕
WBC scan abdomen and pelvis	Usually Not Appropriate	⊕⊕⊕⊕
Nuclear medicine scan gallbladder	Usually Not Appropriate	⊕⊕
Fluoroscopy upper GI series with small bowel follow-through	Usually Not Appropriate	⊕⊕⊕
Fluoroscopy contrast enema	Usually Not Appropriate	⊕⊕⊕

← This imaging modality was ordered

# CT Abdomen/Pelvis with IV contrast (unlabeled)



Axial

# CT Abdomen/Pelvis with IV contrast (unlabeled)



Sagittal

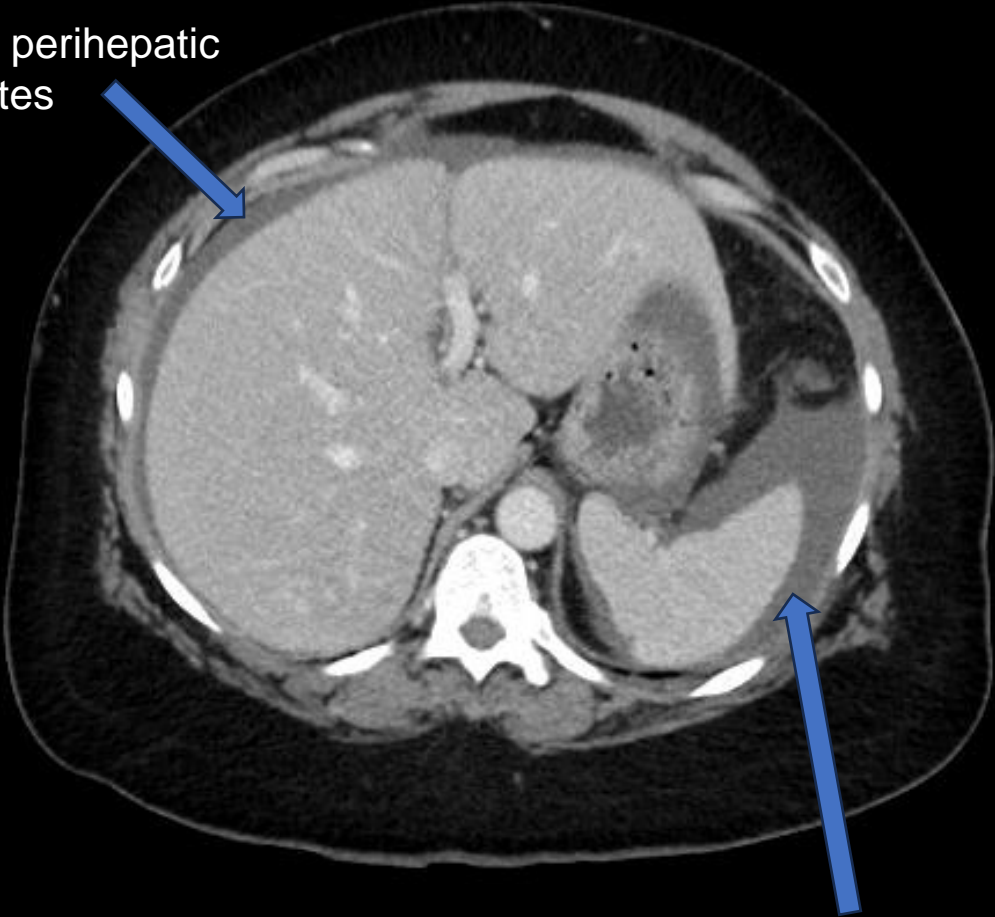


Coronal



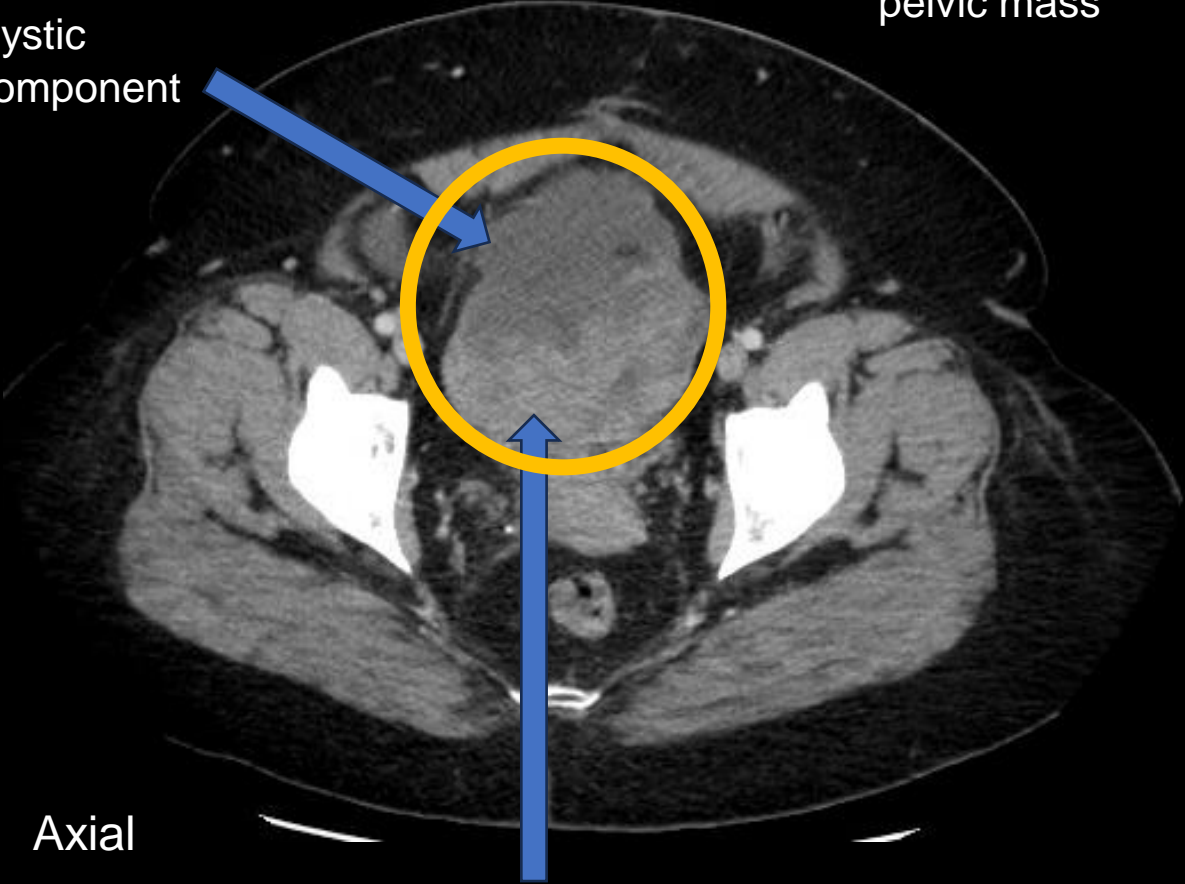
# Radiology Images (labeled)

Mild perihepatic ascites



Moderate perisplenic ascites

Cystic component



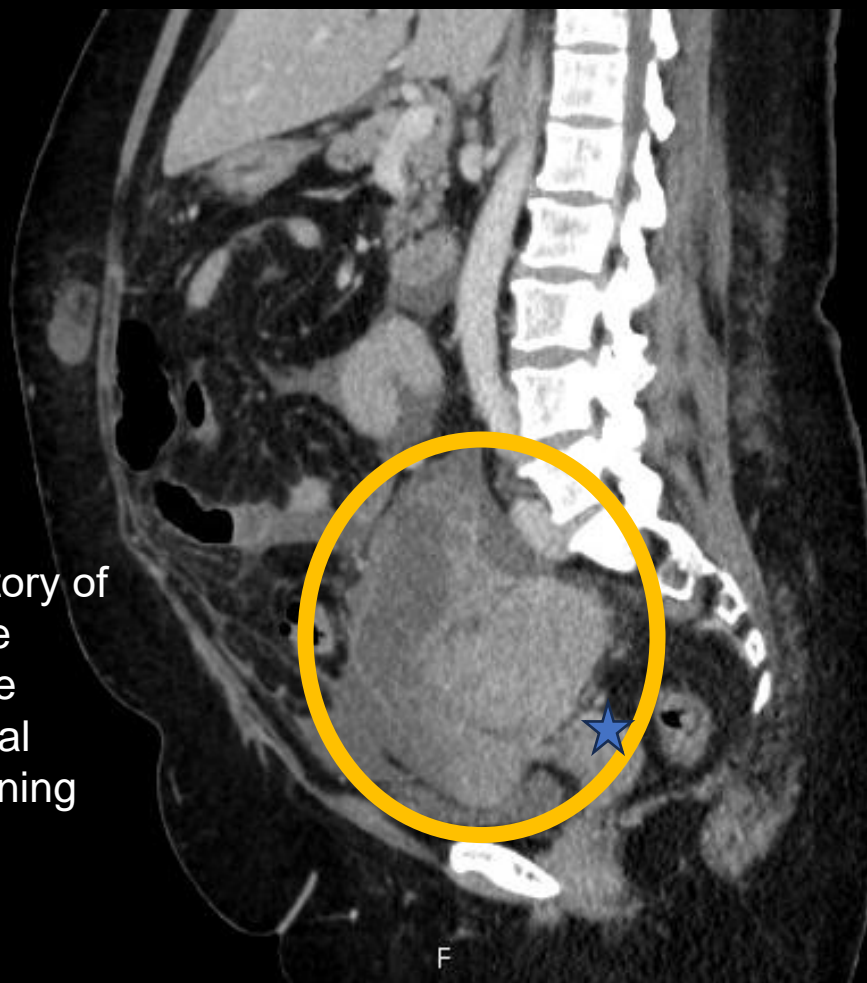
14 cm heterogenous pelvic mass

Axial

Solid component



# Radiology Images (labeled)



14 cm heterogenous pelvic mass

Sagittal

Coronal

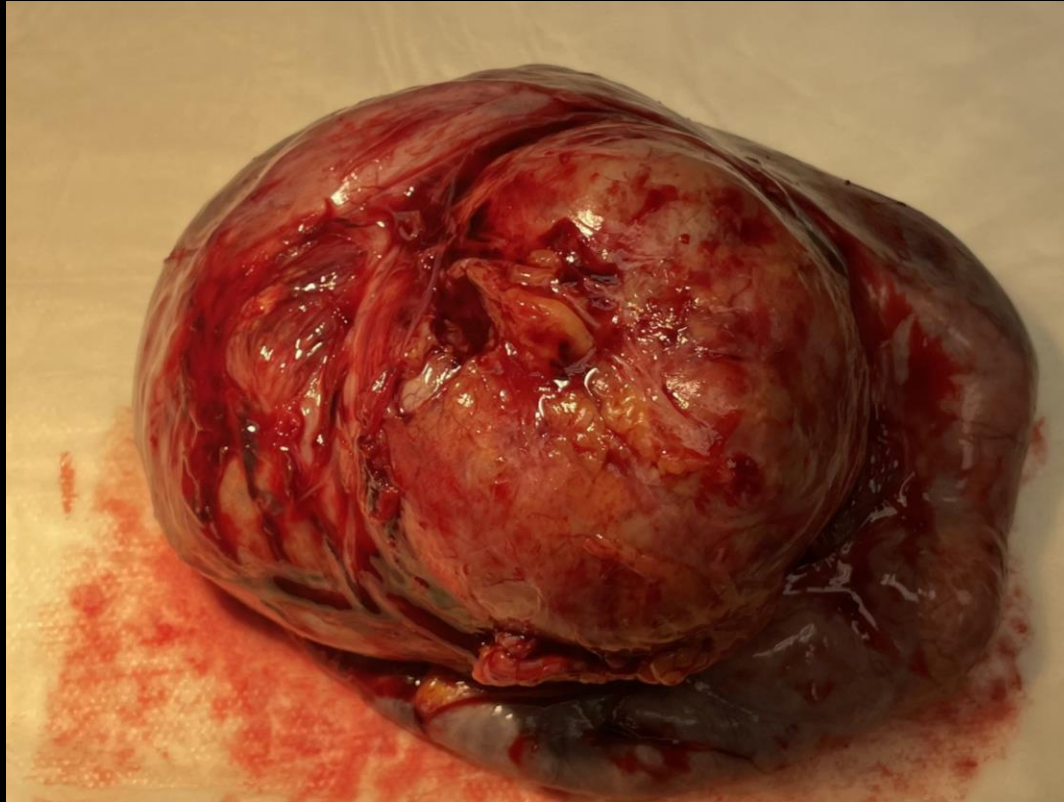
★ Given patient's history of a hysterectomy, the mass appears to be sitting on the vaginal cuff. This is concerning for ovarian cancer.

# Differential Diagnosis based on Imaging

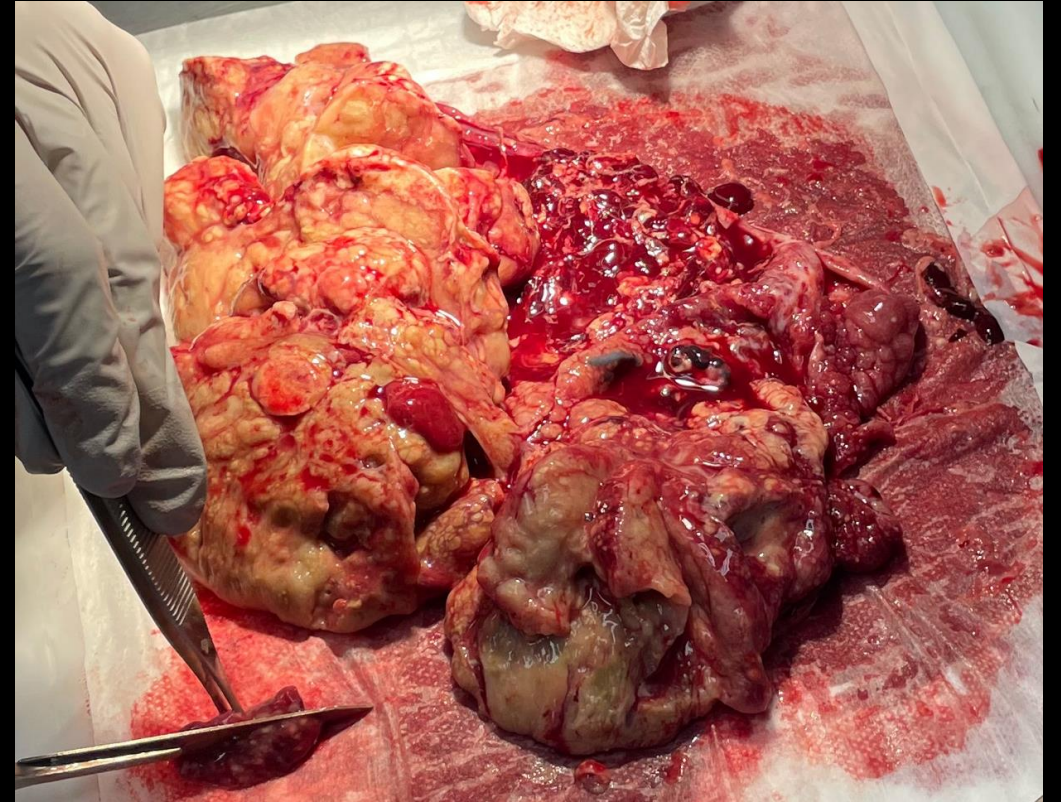
- Ovarian cancer
  - While imaging appearance is often nonspecific, gross pathology appearance and tumor marker profiles along with image correlation can help determine specific subtype
- Extrauterine fibroid
- Lymphoma
  - Rarely can be localized to the ovary. Most common is diffuse large B-cell lymphoma
- Metastases
  - Colon, appendix, stomach, pancreas, breast, lung
  - Mets to the ovaries tend to be bilateral and smaller with peritoneal carcinomatosis often present

# Gross Path

14.0 x 10.5 x 7.5 cm mass solid and cystic components



The outer surface contains areas of hemorrhage. Approximately 200 cc of fluid was expressed from the cystic component

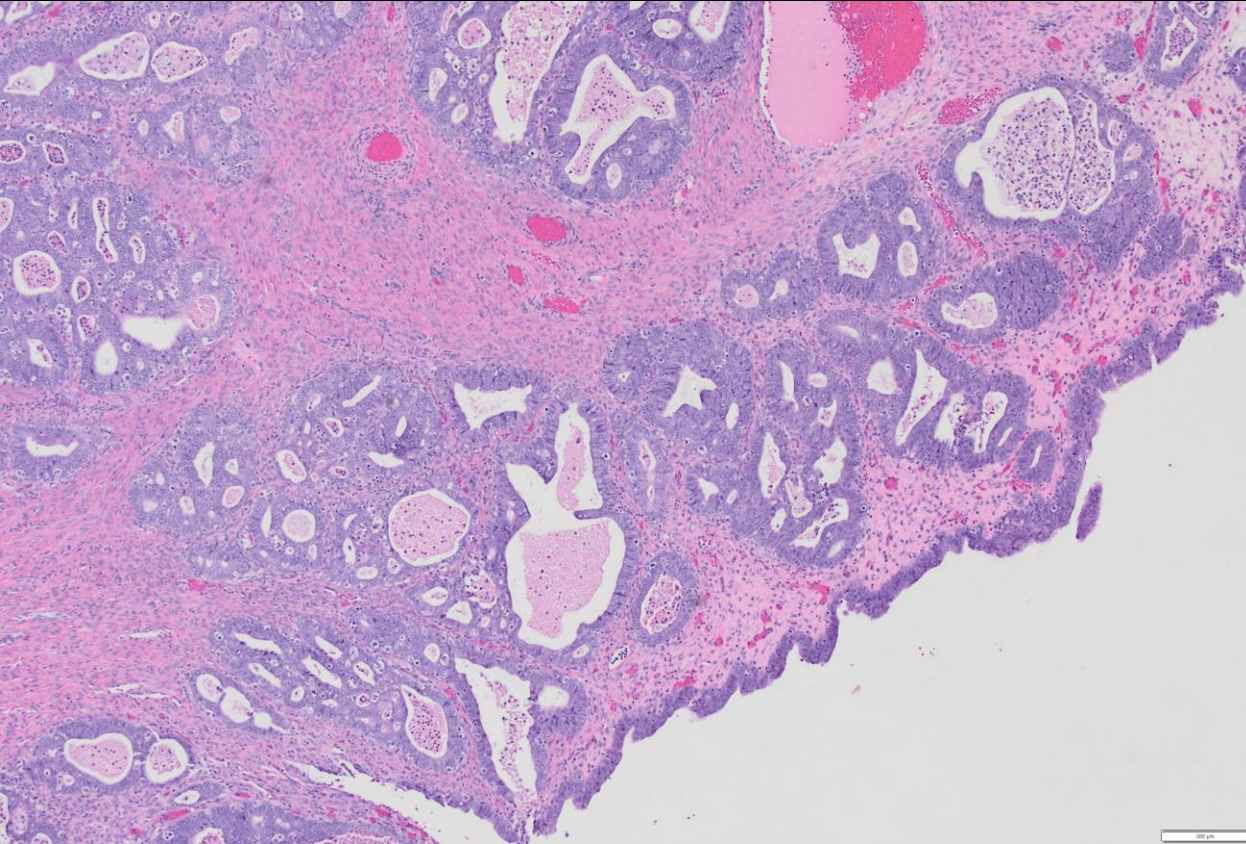


The inner lining solid components



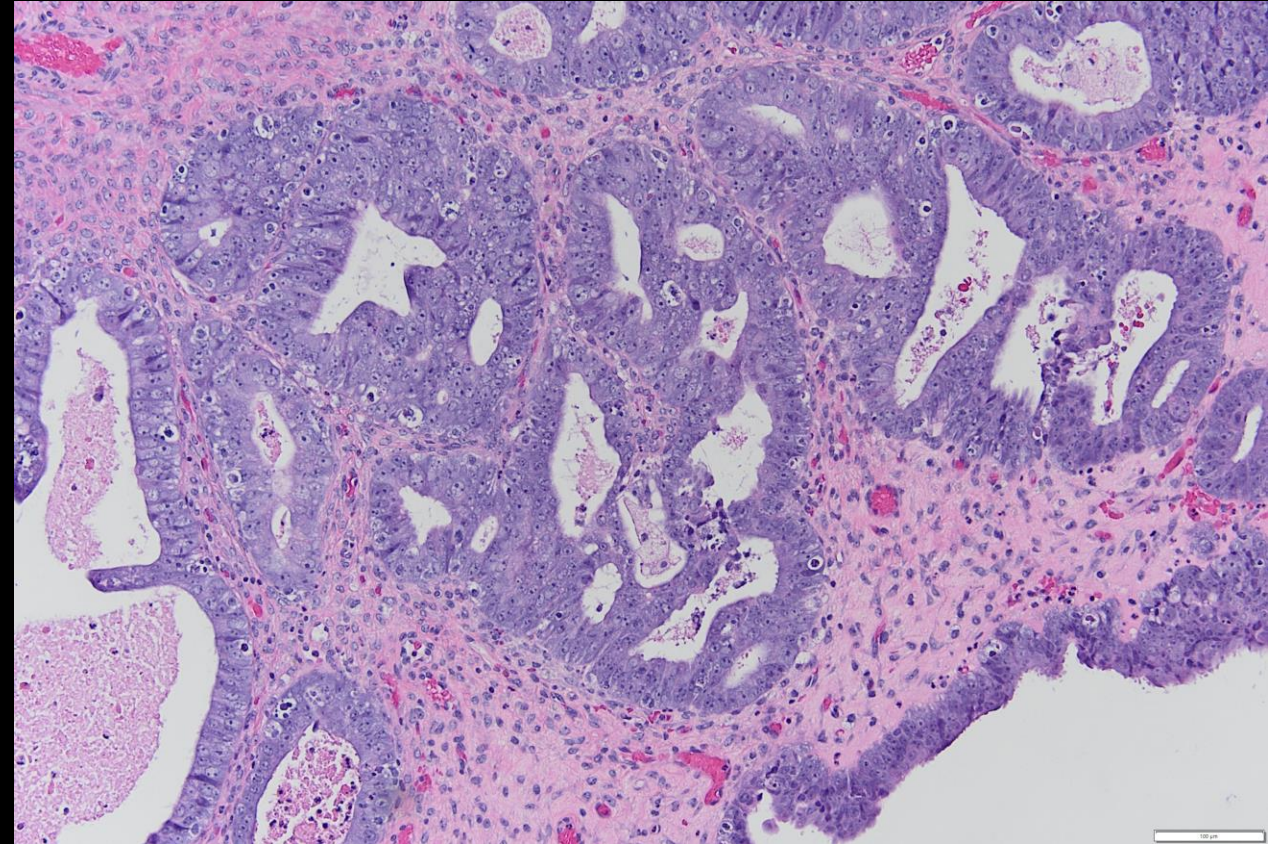
# Microscopic Path

H&E 4x



Glandular adenocarcinoma with many areas of back to back glands with little intervening stroma

H&E 20x



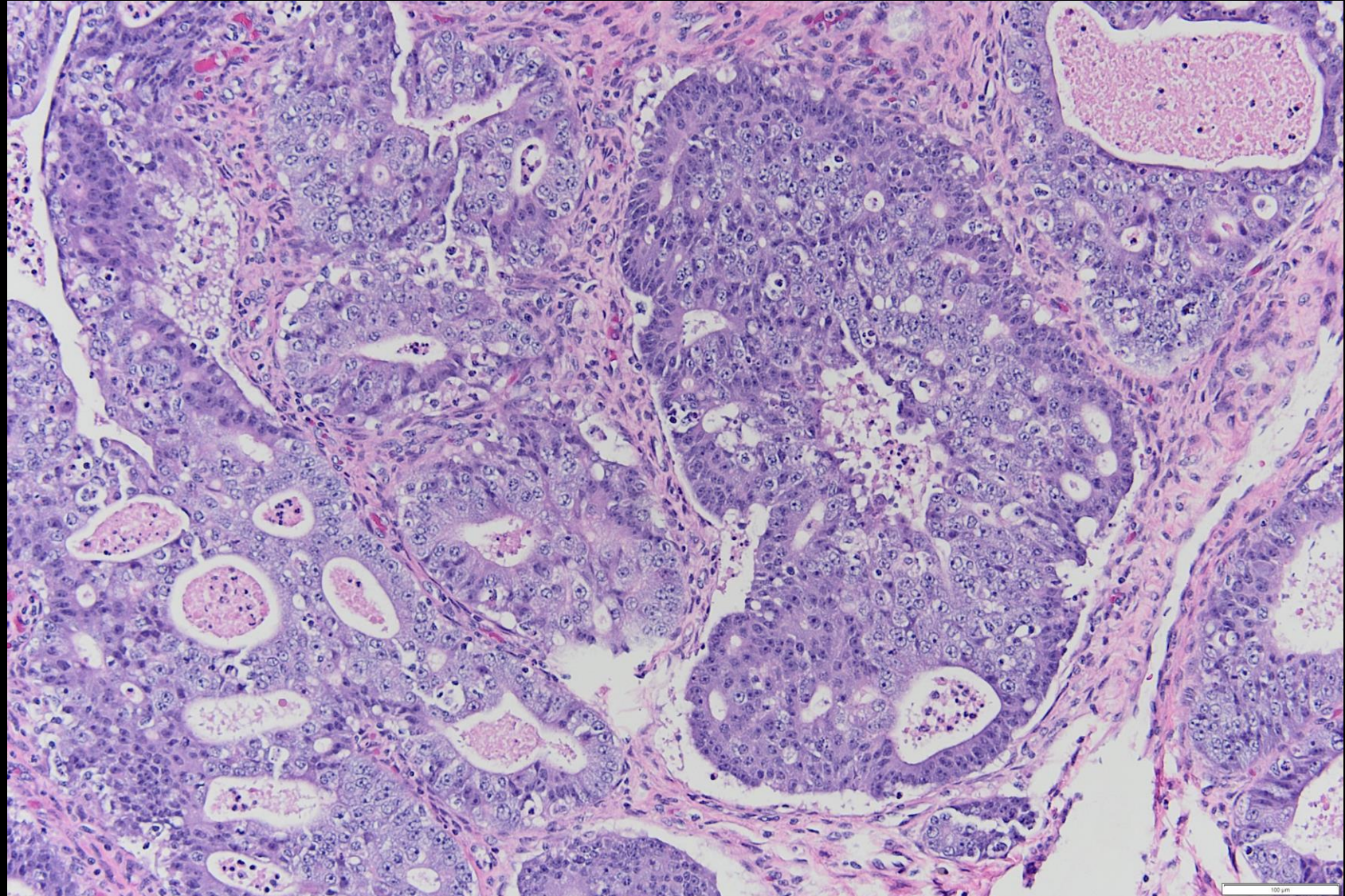
Well formed glands and mild to moderate pleomorphic cells consistent with endometrial carcinoma



# Microscopic Path

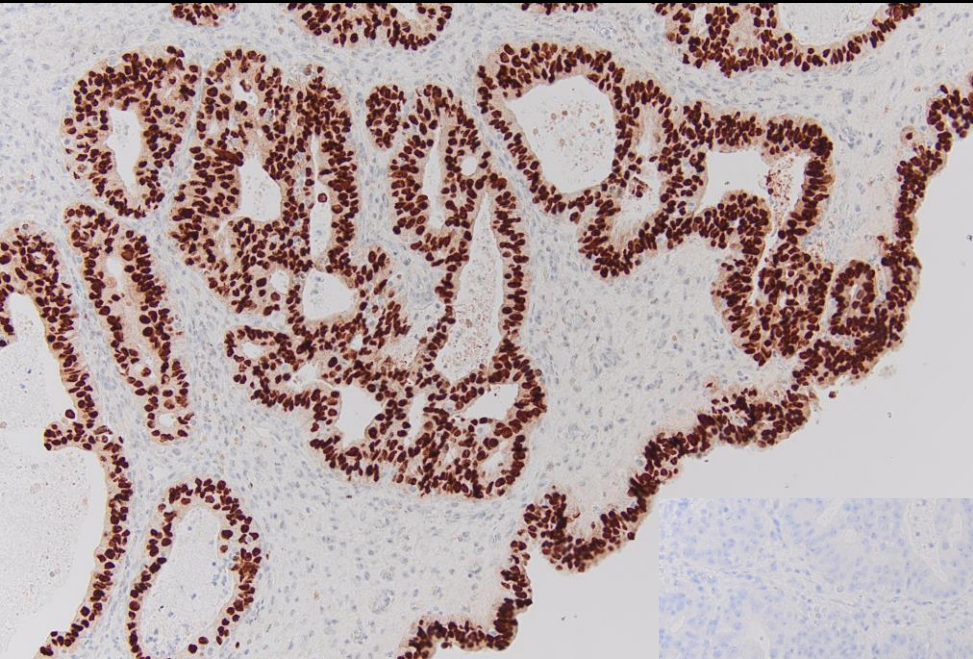
**H&E 10x:** Solid growth upgrading tumor to FIGO grade 2

- Grade 1 tumors exhibit  $\leq$  5% solid nonglandular, nonsquamous growth
- Grade 2 tumors from 6% to 50%
- Grade 3 tumors  $>$  50%

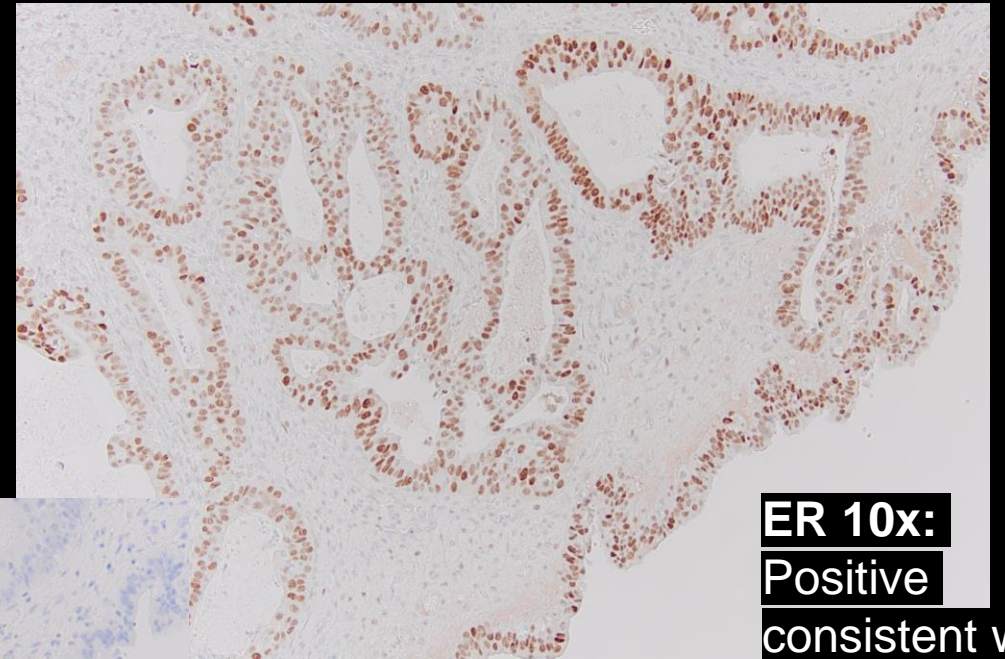




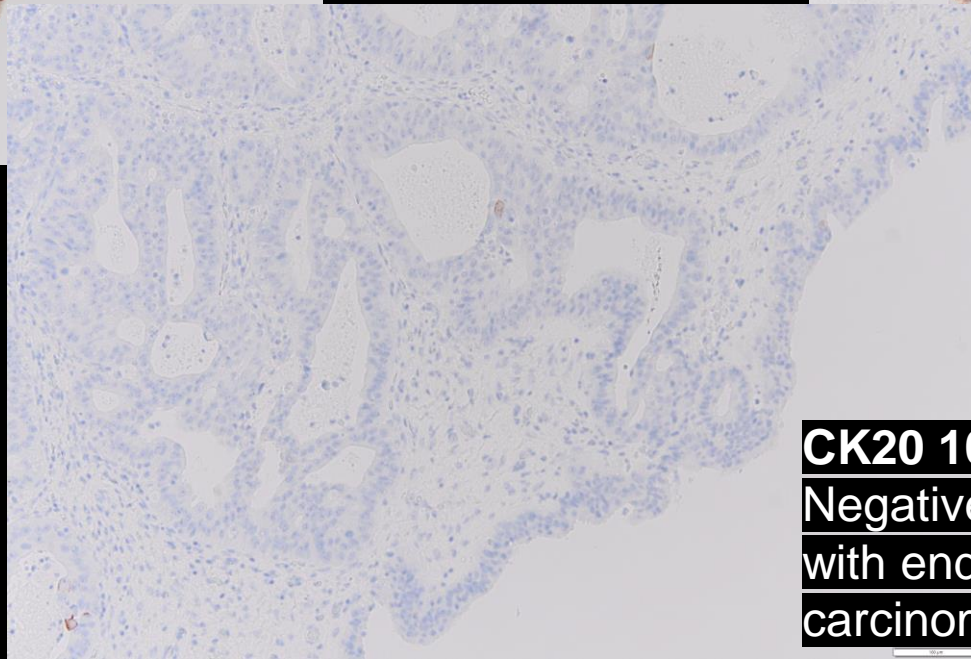
# Microscopic Path



**Pax8 10x:**  
Positive indicating  
gynecological  
origin



**ER 10x:**  
Positive  
consistent with  
endometrial  
carcinoma



**CK20 10x:**  
Negative consistent  
with endometrial  
carcinoma

Final Dx:

Endometrioid Adenocarcinoma FIGO Grade 2

\*Tumor likely arose in prior endometriosis



# Case Discussion

- Endometriosis is a common benign disease defined by the presence of endometrial glands and stroma in ectopic locations
  - Prevalence of endometriosis is estimated at 10% in pre-menopausal women and 2-4% of post-menopausal women.
- Criteria for establishing malignant transformation in endometriosis includes:
  - 1. There must be a clear example of endometriosis in the vicinity of the tumor
  - 2. The histology of the cancer must be consistent with an endometrial origin
  - 3. No other primary site for the tumor can be found
- Malignant transformation has been observed only in around 1% of patients with endometriosis, occurring most commonly in the ovary
- Imaging features to suggest a borderline or malignant tumor include mural nodules, papillary projections, enhancing solid components, thickened walls, and vascularized large septa

# Case Discussion

- Pathogenesis: Mutations in genes that encode for metabolic and detoxification enzymes, such as GALT , GSTM , and PTEN are thought to contribute to the progression from endometriosis to carcinoma
  - Also thought to be related to increased estrogen levels
- Endometriosis is associated with an increased risk specifically of the endometrioid and clear cell subtypes of ovarian cancer.
  - In one 15-year study, 39% of endometrioid carcinomas and 41% of clear cell carcinomas were found in association with endometriosis
- Immunophenotypes
  - Endometrioid carcinoma is positive for CK7, ER, PR, and CA 125 and negative for CK20
  - Endometrial, endocervical, breast, and lung adenocarcinomas are also positive for CK7 and negative for CK 20.
  - Colon carcinoma shows a reverse pattern.

# Case Discussion

- FIGO Staging
  - Most recently updated in 2023 to better define the pathology and molecular findings as they relate to the type of endometrial carcinoma
    - Stage 1= limited to an endometrial polyp or confined+ low grade
    - Stage 2= invasion of the cervical stroma or any myometrial involvement
    - Stage 3= the tumor has spread locally or regionally
    - Stage 4= extrapelvic peritoneal metastasis, local invasion of the bladder or bowel, or distant metastases
  - Includes a tumor grading system that allows for easier clinical decision making
    - Histopathological findings are an important prognostic predictor
    - Non-aggressive histological types are low-grade (grades 1 and 2)
    - Aggressive histological types, mesonephric-like and gastrointestinal type mucinous carcinomas are grade 3
  - Prognosis is made on the basis of a combination of histologic subtype, tumor grade, operative extent of disease, and residual disease after surgical treatment.
    - Baseline CA-125 levels can be helpful for disease surveillance

# References:

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