AMSER Case of the Month:

31-year-old female with a large pelvic mass

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Patient Presentation

- 31-year-old F with PMH of anxiety and depression initially presented due to acute nausea, vomiting and abdominopelvic pain
- She had been experiencing frequent abdominal pressure and distension, dyspareunia, sometimes passes out due to pain, low appetite with intermittent nausea
- G0P0 who potentially desired future fertility unless she had carcinoma
- Former smoker, quit in October 2023
- BMI = 24.5
- Family history is negative for ovarian cancer
- Reported that tumor markers were checked by her gyn and reported to be normal
- Pertinent Labs: ß hCG is negative

What Imaging Should We Order?

ACR Appropriateness Criteria

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	☢☢☢☢

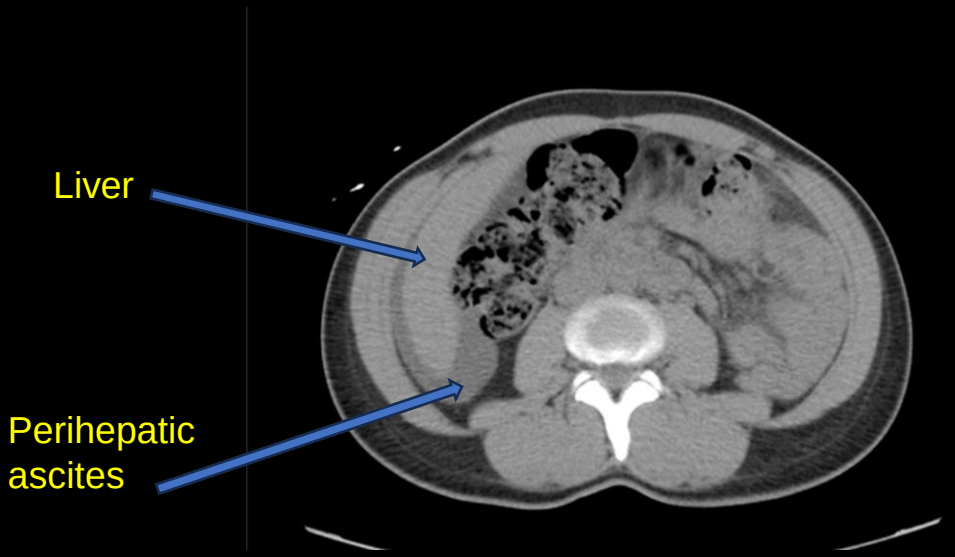
These imaging modalities were ordered

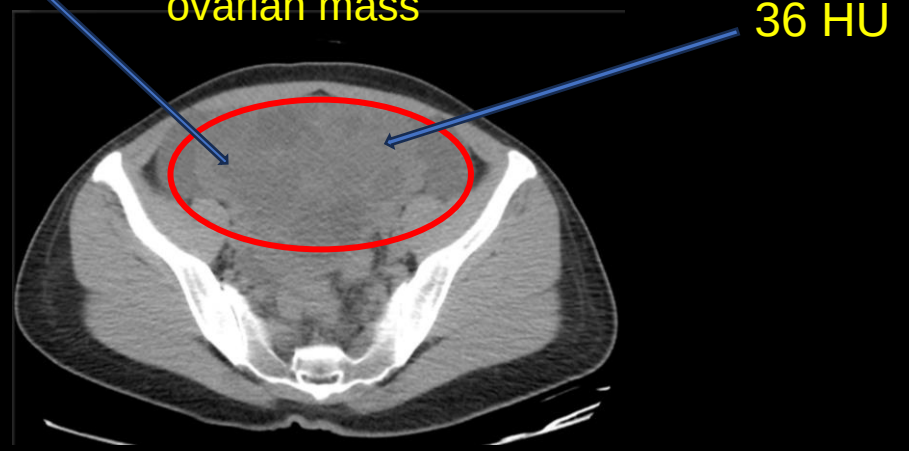
AMSER

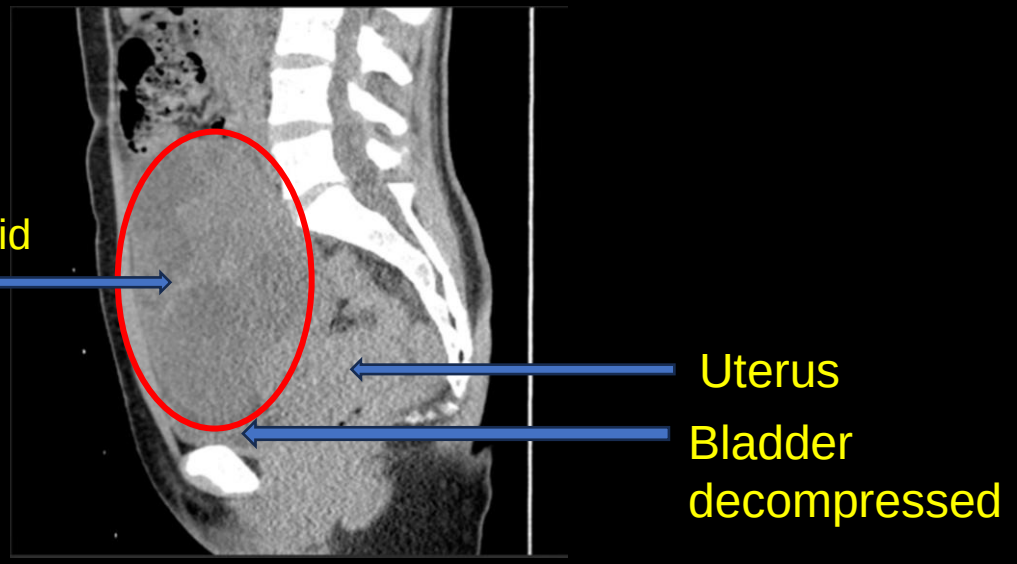
Scout

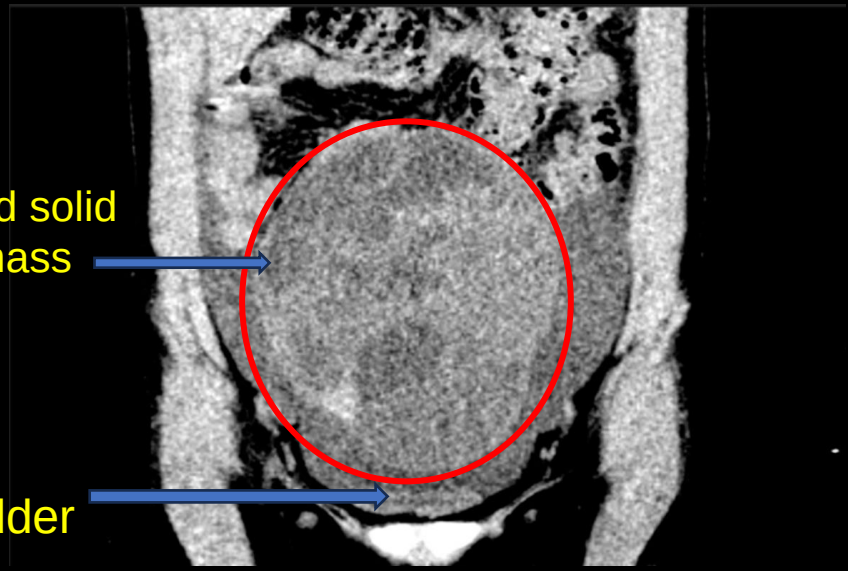
CT without contrast (unlabeled)

CT (labelled)

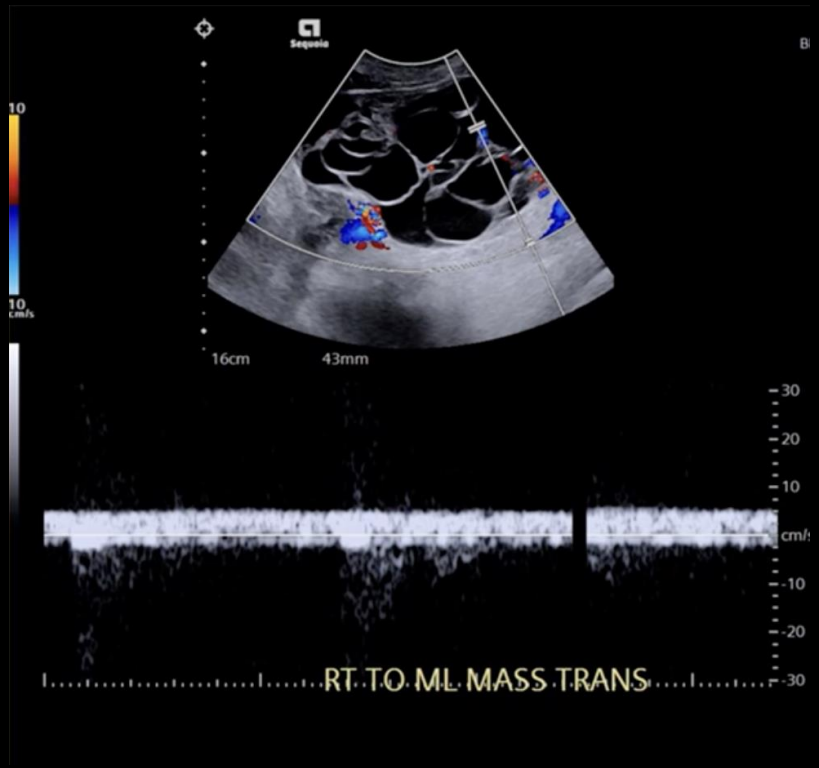

Liver
Perihepatic ascites

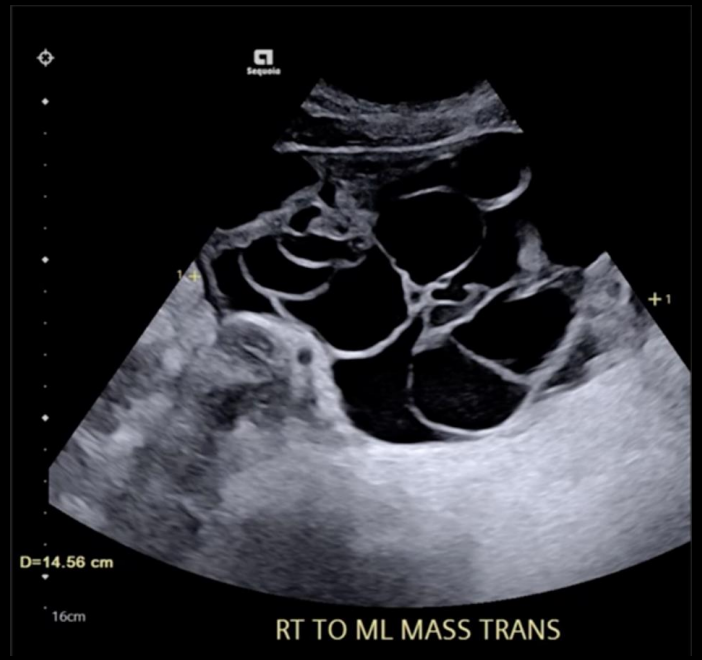

17 HU
Cystic and solid ovarian mass
36 HU

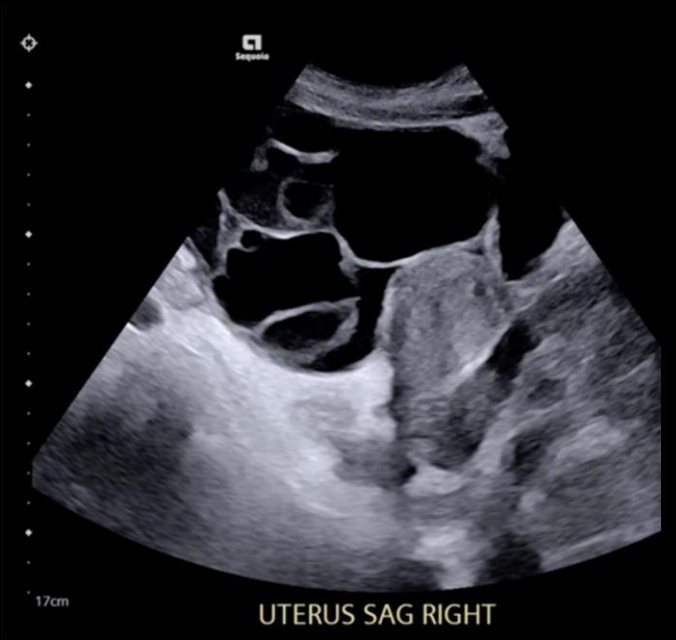

Cystic and solid ovarian mass
Uterus
Bladder decompressed


Cystic and solid ovarian mass
Bladder

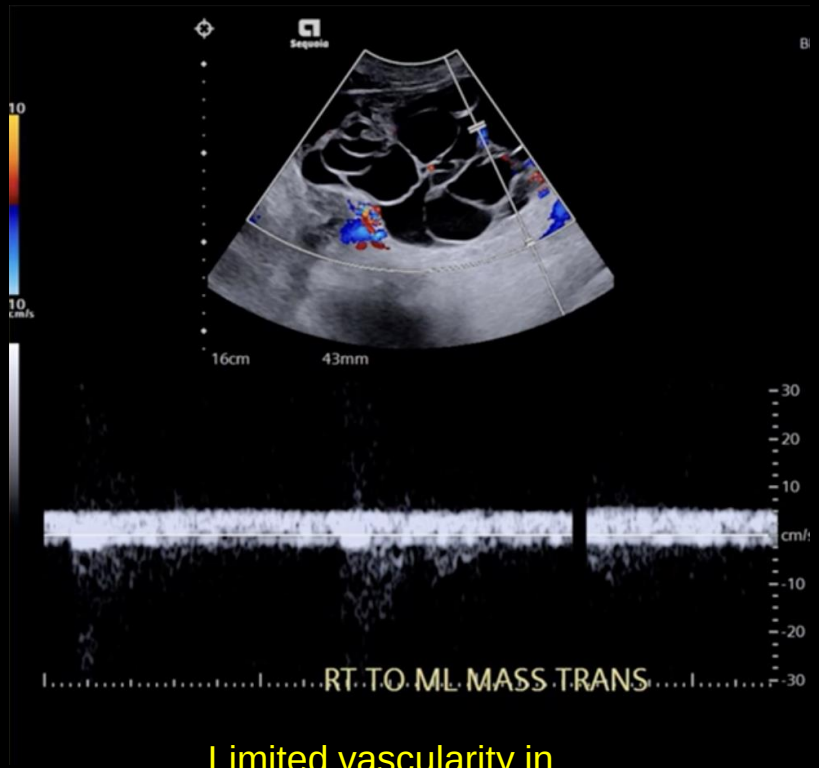
Transvaginal Ultrasound (Unlabelled)



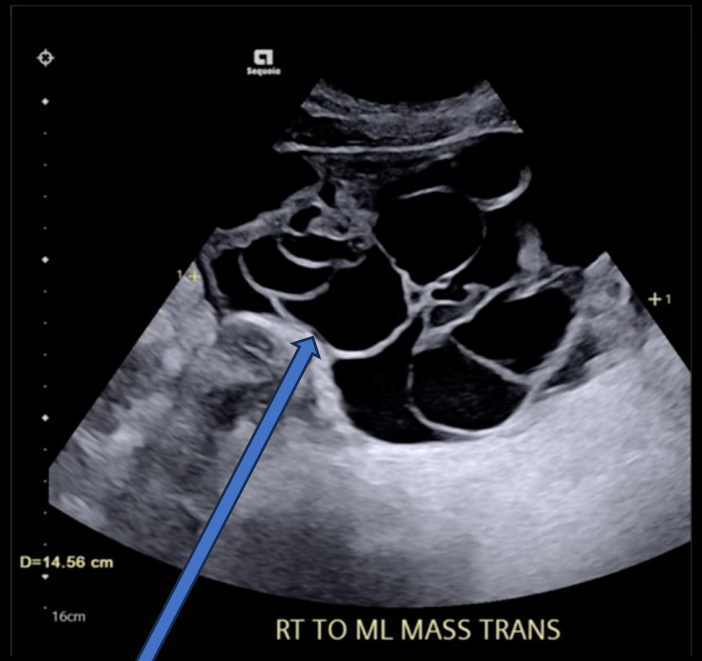




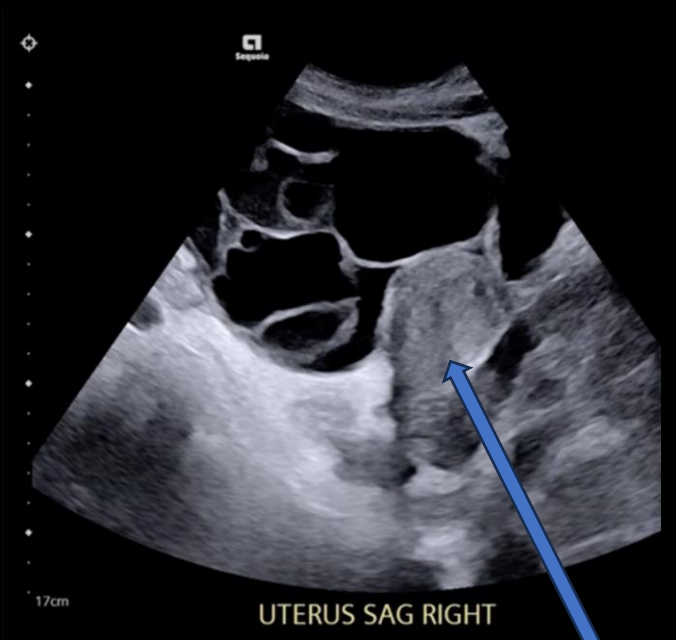
Transvaginal Ultrasound



Limited vascularity in mass, only seen in septations



Cystic mass with septations



Uterus

Differential Diagnoses Based on Imaging

- Ovarian neoplasm (including mucinous, serous, borderline, endometrioid, etc)
- Metastases
- Lymphoma
- Exophytic degenerative fibroid

After Imaging…

- Patient received exploratory laparotomy, left salpingo-oophorectomy, peritoneal biopsies, partial omentectomy, and appendectomy

Gross Images

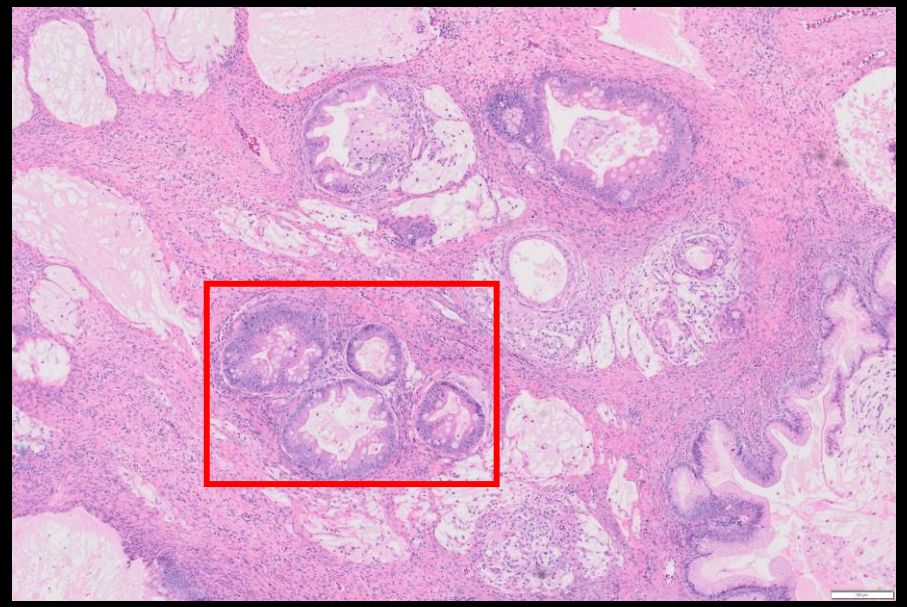
Mass measuring 14 cm

Fallopian tube

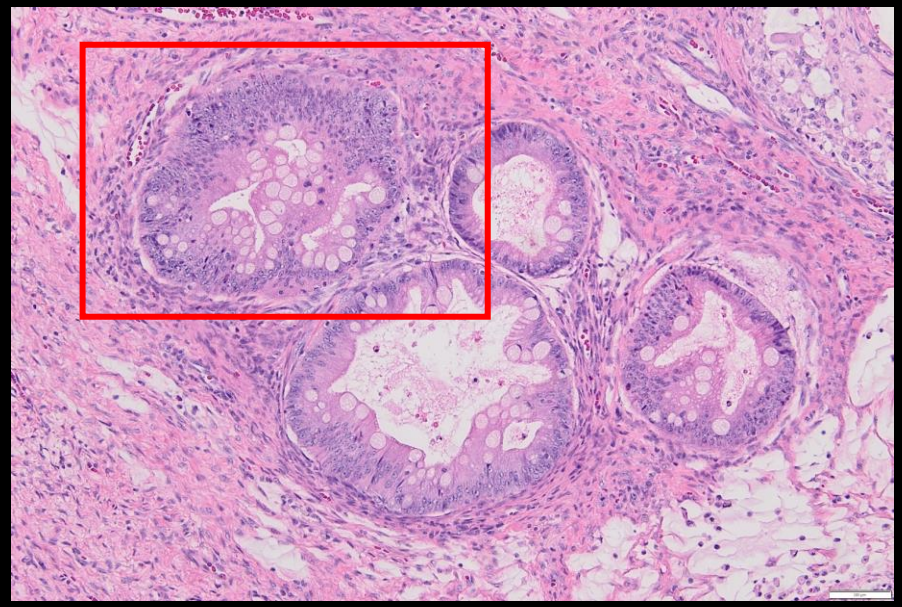
Ovarian mass

Dissected Left Ovarian Mass

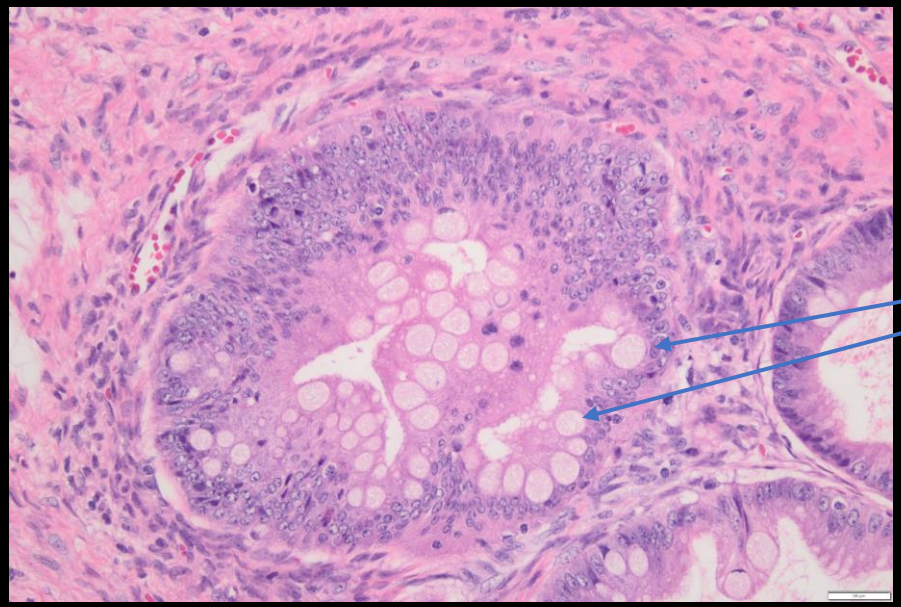
Histopathology (H&E stain) of the Left Ovary



4x



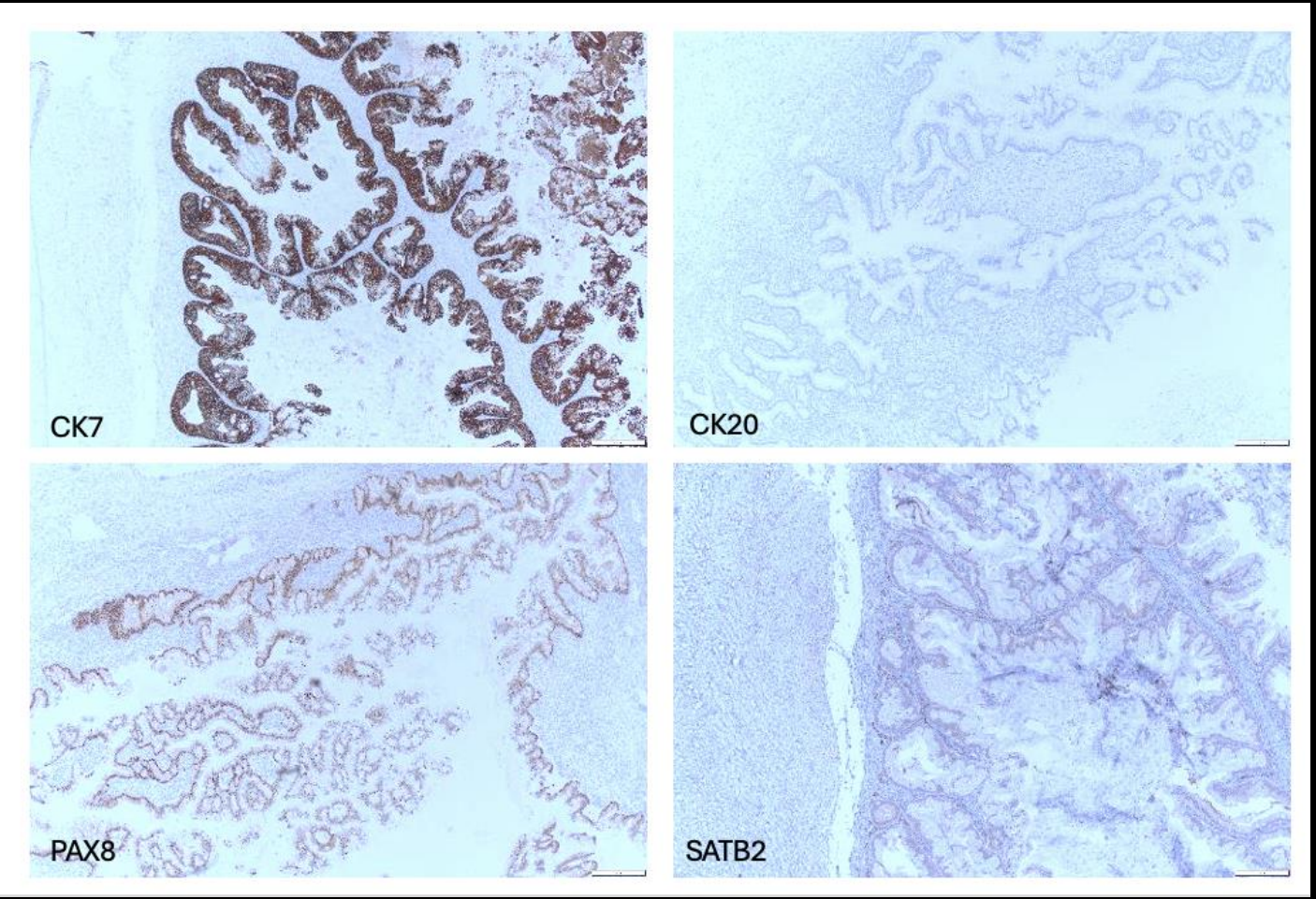
10x



20x

This lesion contains multiple cysts lined by GI type mucinous epithelium showing variable degrees of stratification, tufting, and filiform papillae with a cribiforming architecture. The epithelium contains scattered goblet cells and is pseudostratified with low-grade nuclear atypia.

Histopathology



Left ovary at 4x.
IHC shows that the tumor cells are positive for CK7 and PAX 8, are focally positive for CK20 and negative for SATB2, supporting an ovarian origin.

Final Dx:

Mucinous Borderline Neoplasm of the Ovary

Case Discussion

- Mucinous neoplasm of the ovary is a type of epithelial tumor and represent 10-15% of all ovarian tumors.
- Mucinous ovarian neoplasms have 3 types:
  - Benign (80%)
  - Borderline (16-17%)
  - Carcinoma (3-4%)
- Affect women in their 20s to 40s, with borderline tumors being diagnosed at 40-49
- Symptoms include
  - pain
  - pelvic fullness

Case Discussion

- Microscopic findings:
  - Borderline tumors are characterized by mild to moderately atypical, gastrointestinal type, mucin containing epithelial cells that show more proliferation than benign tumors
  - The epithelium will resemble gastric pyloric epithelium, and may include Goblet cells, neuroendocrine cells and Paneth cells
- Gross Pathology:
  - These tumors are usually unilateral and will have a smooth external surface, and will contain cysts filled with mucin

Case Discussion

- Treatment involves an exploratory laparotomy with removal of involved adnexa, with post menopausal women receiving a hysterectomy and BSO
- Mucinous borderline tumors have an excellent prognosis with 98% survival at 5 years
- KRAS mutations are found to be associated
- Tumor Markers:
  - Levels of CA 19-9, CEA and CA-125 are used

References:

Brown J, Frumovitz M. Mucinous tumors of the ovary: current thoughts on diagnosis and management. Curr Oncol Rep. 2014 Jun;16(6):389. doi: 10.1007/s11912-014-0389-x. PMID: 24777667; PMCID: PMC4261626.

Marko J, Marko KI, Pachigolla SL, Crothers BA, Mattu R, Wolfman DJ. Mucinous Neoplasms of the Ovary: Radiologic-Pathologic Correlation. Radiographics. 2019 Jul-Aug;39(4):982-997. doi: 10.1148/rg.2019180221. PMID: 31283462; PMCID: PMC6677283.

Taylor EC, Irshaid L, Mathur M. Multimodality Imaging Approach to Ovarian Neoplasms with Pathologic Correlation. Radiographics. 2021 Jan-Feb;41(1):289-315. doi: 10.1148/rg.2021200086. Epub 2020 Nov 13. PMID: 33186060.