AMSER Case of the Month July 2025

36yo female with pelvic discomfort

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Patient Presentation

- 36yo female
- **CC**: 2 weeks of increased pelvic pressure, constipation, and incomplete bladder emptying. Patient is amenorrheic on continuous OCP, with last withdrawal bleed during placebo week, 2 months ago, and has had irregular spotting and intermittent pelvic cramps since
- **PMHx**: Asthma. IBS. Recurrent episodes of URI/pneumonia in preceding Fall requiring antibiotics and steroid taper
- **PSHx**: Colonoscopy (IBS work up). Tonsillectomy
- **Meds**: Continuous OCP. Ibuprofen PRN for pelvic discomfort
- **Exam:** Mobile, nontender uterus enlarged to 16-week size. Adnexa felt to be inadequately evaluated on physical exam.

Pertinent Labs

- VSS
- Hgb 10.2, WBC 7.6
- CMP: grossly wnl
- Beta-hCG: negative
- CEA, CA-125, CA19-9, AFP: wnl
- Colonoscopy (7 years ago): unremarkable

What Imaging Should We Order?

Select the applicable 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	☢☢☢☢

Initial Imaging

Subsequently ordered due to suboptimal evaluation with US

(Table from [1])

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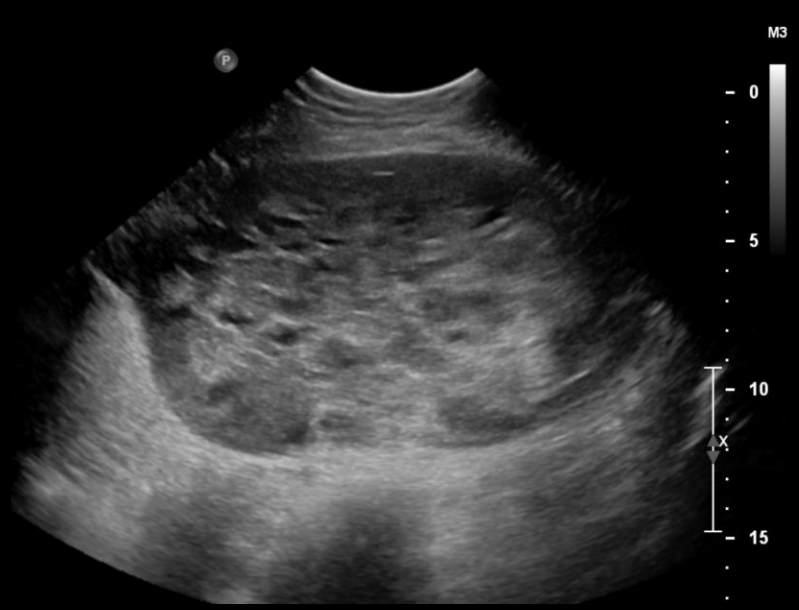
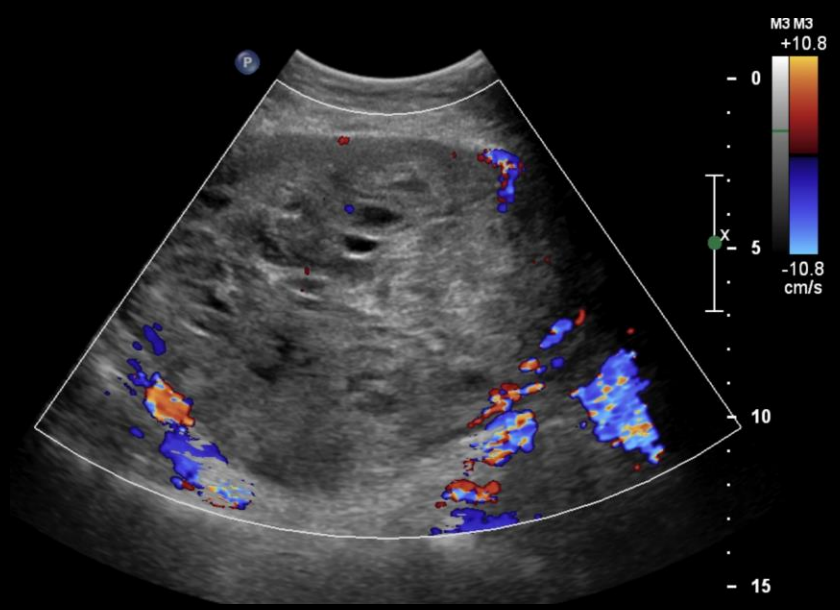
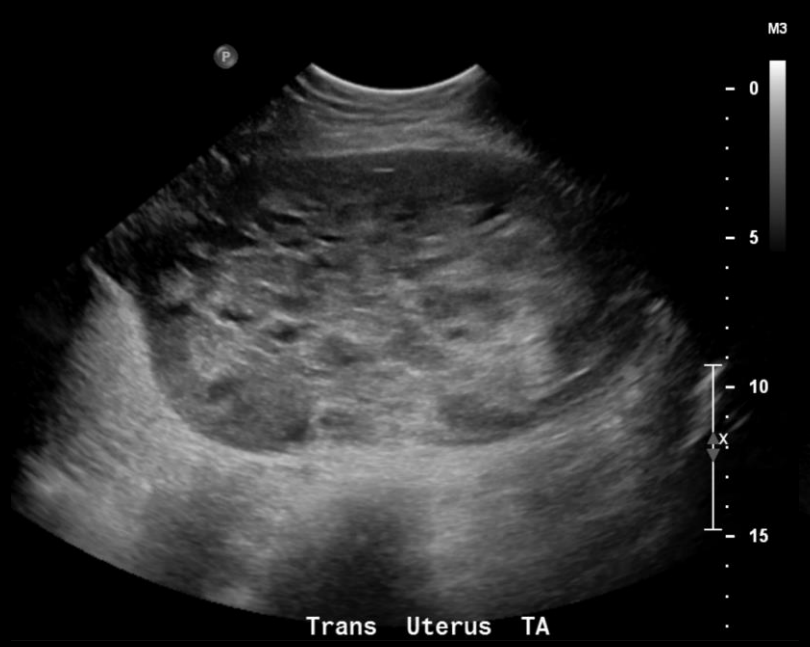
US Findings (unlabeled)

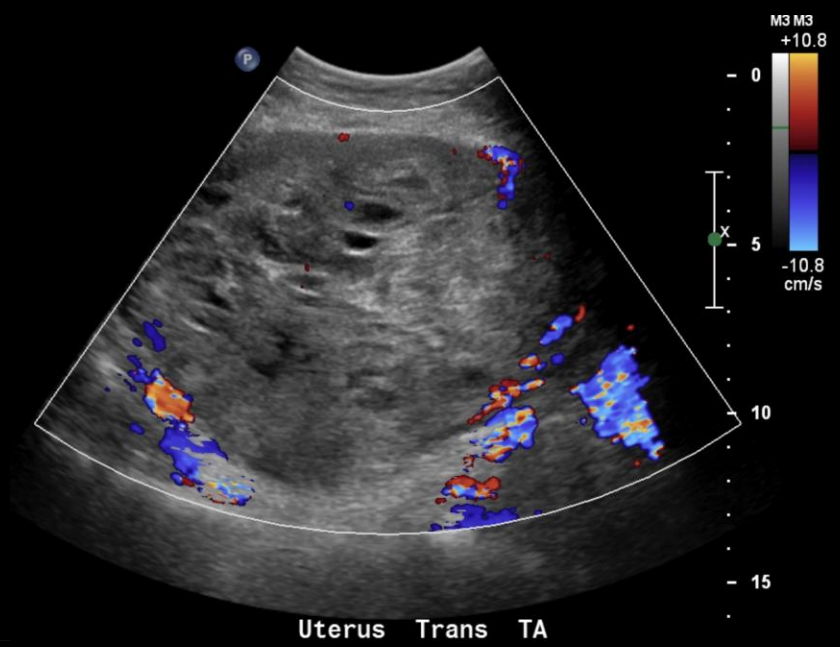




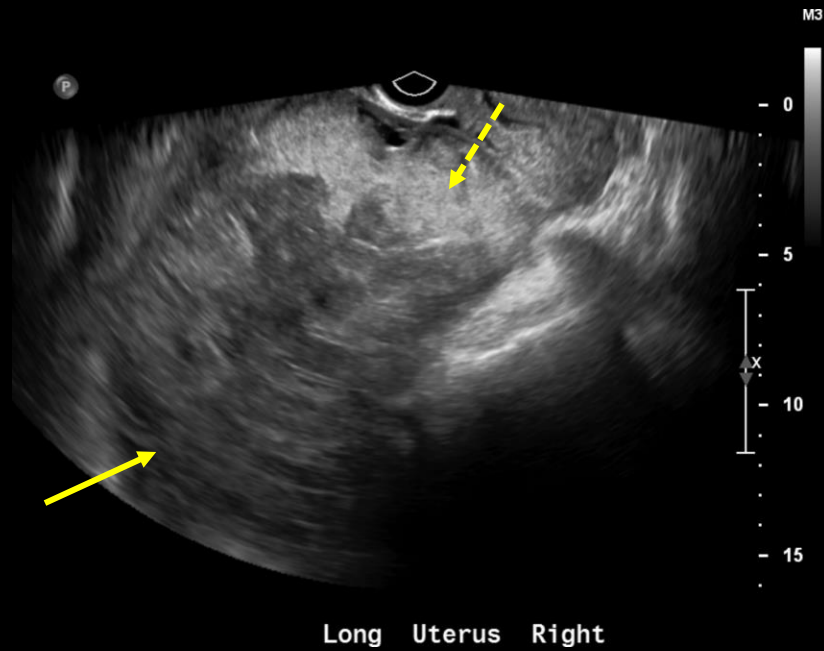
US Findings (labeled)



TA short-axis: pelvic mass, felt on TA examination to represent an enlarged uterus with heterogenous appearing myometrium.

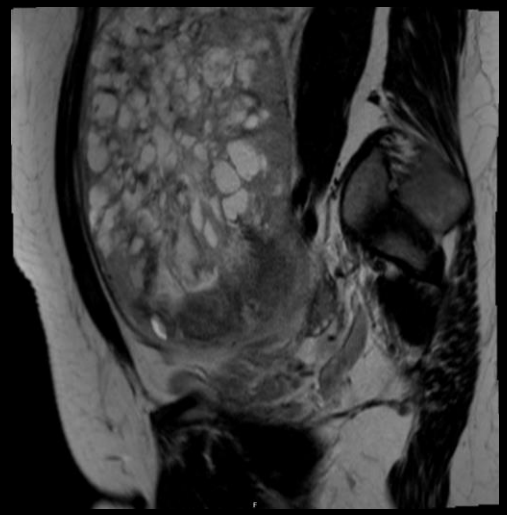


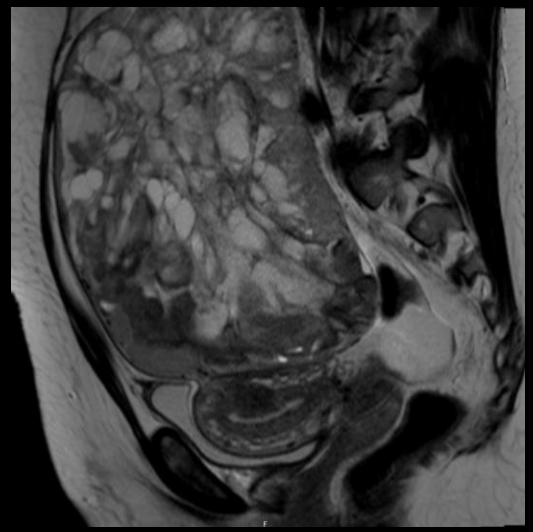
TA Doppler: visualized mass does not have abnormally increased vascularity.

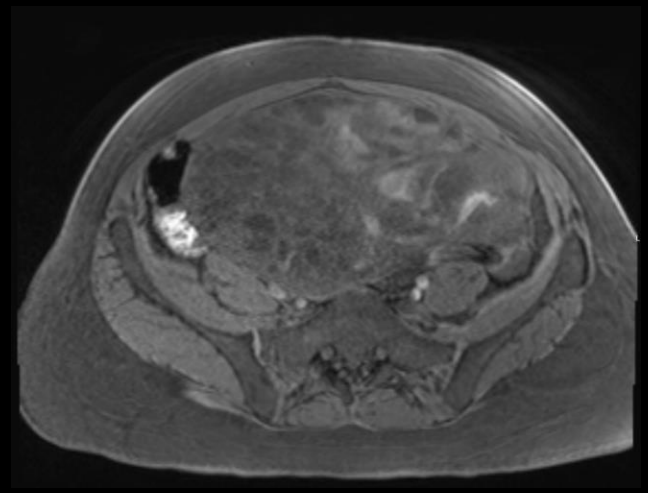


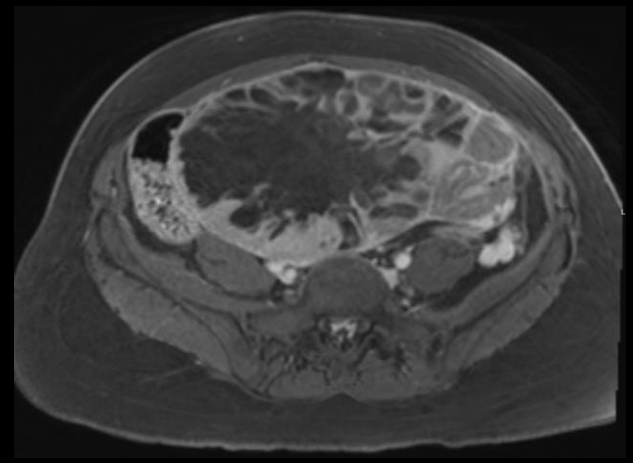
TV long-axis: ill-defined, hypoechoic mass abutting or involving the uterus (solid arrow) and obscuring the fundus. The rest of the visualized uterus displays unremarkable myometrium (dashed arrow).

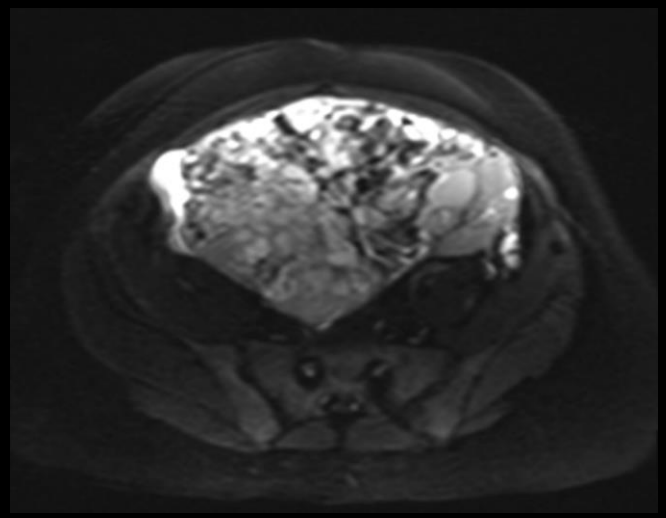
MR Findings (unlabeled)

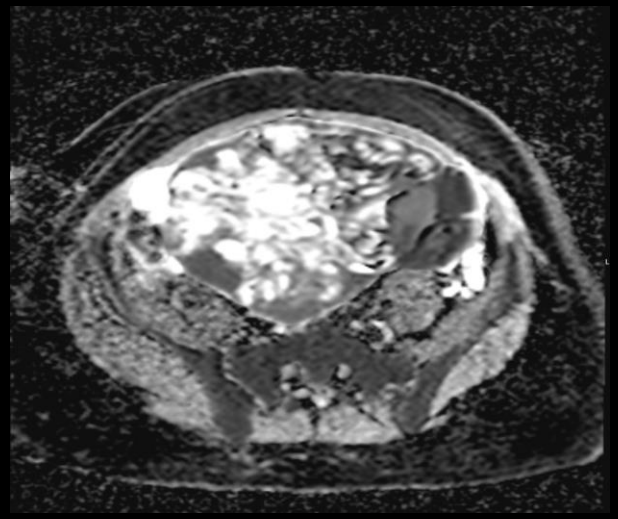












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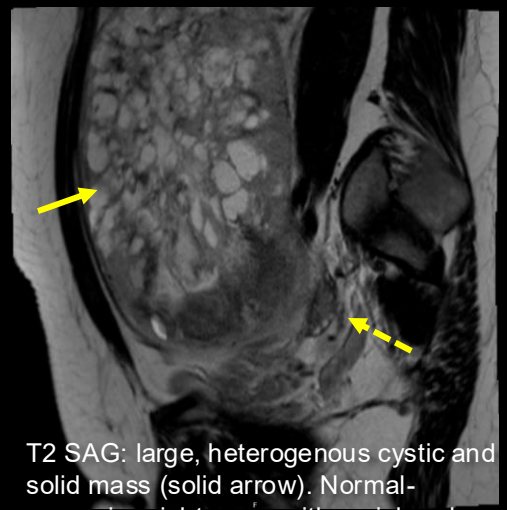
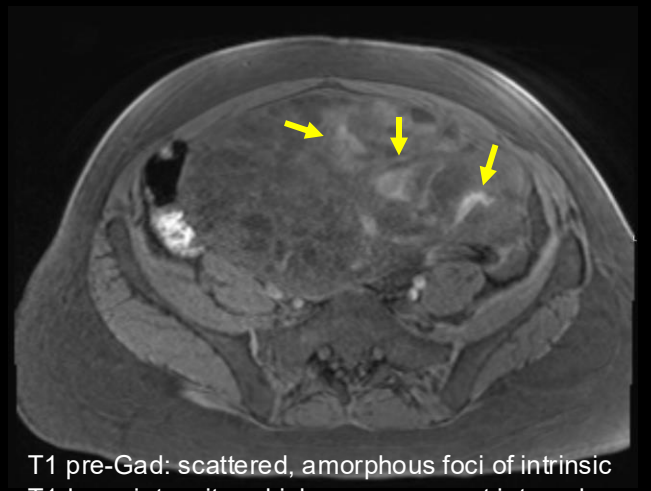
MR Findings (labeled)

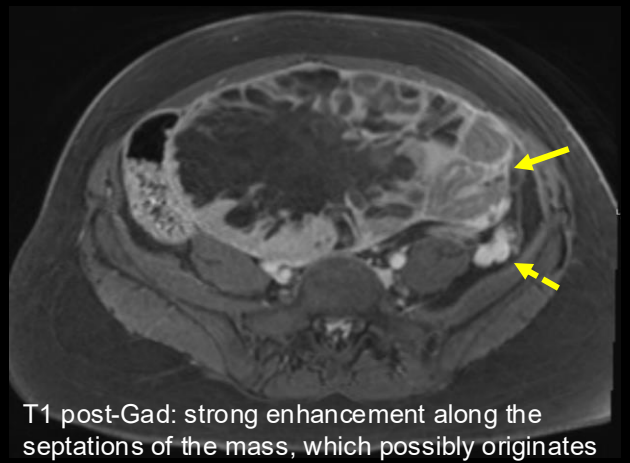


T2 SAG: large, heterogenous cystic and solid mass (solid arrow). Normal-appearing right ovary with peripheral follicles (dashed arrow).

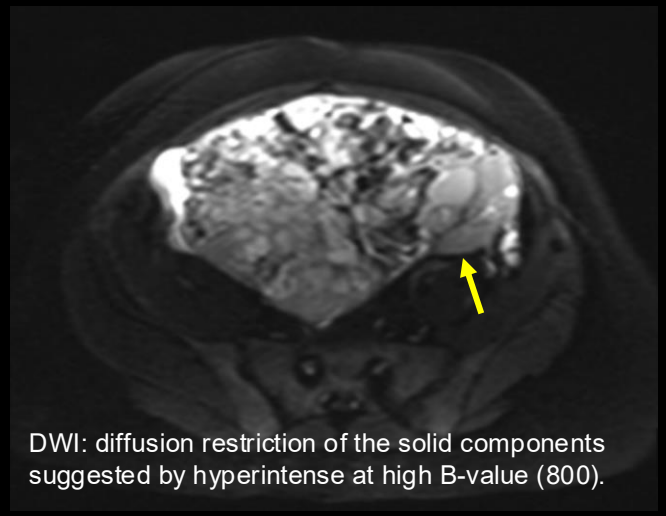
T2 SAG (different slice): the mass abuts but does not appear to infiltrate the posterior uterine body (hollow arrow heads bracket interface).



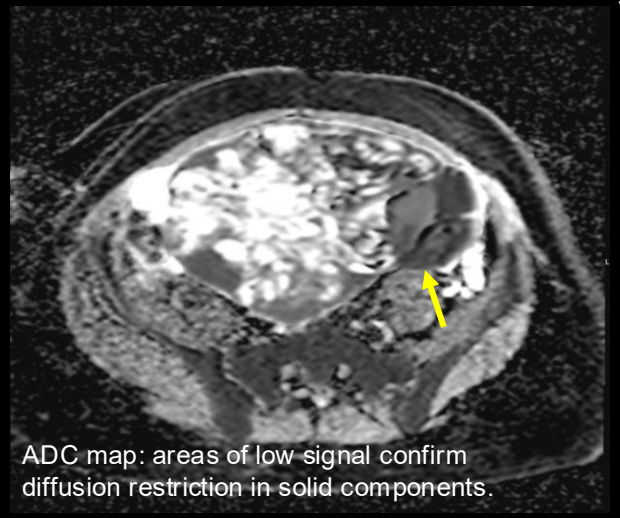
T1 pre-Gad: scattered, amorphous foci of intrinsic T1-hyperintensity, which may represent internal hemorrhage/proteinaceous debris.



T1 post-Gad: strong enhancement along the septations of the mass, which possibly originates from the left ovary (solid arrow). No normal-appearing left ovary otherwise visualized. Dilated left ovarian vein (dashed arrow) is consistent with congestion due to compression.



DWI: diffusion restriction of the solid components suggested by hyperintense at high B-value (800).



ADC map: areas of low signal confirm diffusion restriction in solid components.

Clinical Course

- After imaging acquisition, patient was transferred from outside hospital for second opinion and further management.
- Due to unclear origin of the mass and possibility of retroperitoneal sarcoma suggested by outside imaging report, the patient underwent exploratory laparotomy with Surgical Oncology.
- Intraoperatively, the mass was noted to arise from the left ovary. Gynecologic Oncology was consulted, and the patient underwent TAH-BSO, omentectomy, pelvic and paraaortic lymphadenectomy, and tumor debulking.

Final Dx:

Granulosa Cell Tumor, adult type

Case Discussion: Pathophysiology

- Granulosa cell tumor (GCT) is a type of sex cord-stromal tumor (SCST) of the ovary.
- Comprises 2-5% of all ovarian malignant neoplasms, but accounts for the majority of malignant SCSTs [2-3,5].
- Hormone positive; estrogen secretion can lead to precocious puberty (in adolescents) and/or endometrial hyperplasia/carcinoma (in adults) [2-3].
- Divided into adult (95%) and juvenile (5%) types. Juvenile GCT (90% diagnosed < age 30) is associated with more favorable prognosis [2-3].

Case Discussion: Diagnosis and Management

- GCTs exhibit a spectrum of imaging phenotypes [4]:
  - *More common*: **multilocular solid** mass with **"bunch of grapes"** appearance with large number of small locules that may contain serous fluid or hemorrhage.
  - *Less* common: mass with variable proportion of solid and cystic components, ranging from completely cystic to completely solid.
  - This is unlike other SCSTs of the ovary (e.g., Sertoli-Leydig cell tumor, fibroma), which are predominantly solid.
- Stage I GCT has excellent (> 90%) 5-year disease-free survival after resection [2].
- Inhibin B is a serum marker for SCSTs and can be used to monitor for recurrence [2].

Teaching Points: Diff Dx of Cystic Ovarian Mass

Cystic ovarian masses have a broad differential diagnosis:

- Malignant [5,6]:
  - Serous/mucinous epithelial neoplasm
  - Certain germ cell tumor (cystic teratoma, yolk sac tumor)
  - Metastasis (commonly GI)
- Benign [7]:
  - Physiologic cyst (follicle, corpus luteum), endometrioma, peritoneal inclusion cyst, para-ovarian/para-tubal cyst

Helpful differentiating imaging features include [5,6,7]:

- Size, laterality, number of locules, presence of carcinomatosis: help to differentiate between serous and mucinous neoplasms, and between primary mucinous neoplasm and mucinous metastases
- Thickened septa, intracystic papillary projections, large solid components: suggest high malignancy likelihood
- Endometrial changes: endometrial hyperplasia is associated with GCT and endometrioid carcinoma
- Macroscopic fat/calcification: specific for teratoma

References:

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