

RADY 401 Case Presentation

Teresa Griffin 9/12/23

Focused patient history and workup

- 60-year-old women presented with a year long history of bloating, frequent urination, and reflux.
- Diagnosed with Infiltrating Ductal Carcinoma 3 months prior
- Reported 30lb weight loss over past few months
- FH: uterine cancer in daughter (diagnosed at age 37); uterine or ovarian cancer in mother
- Physical Exam:
 - Abdomen: increased abdominal girth, no tenderness to palpation, and no palpable fluid wave.
 - Lymphadenopathy: No cervical, supraclavicular, or inguinal adenopathy

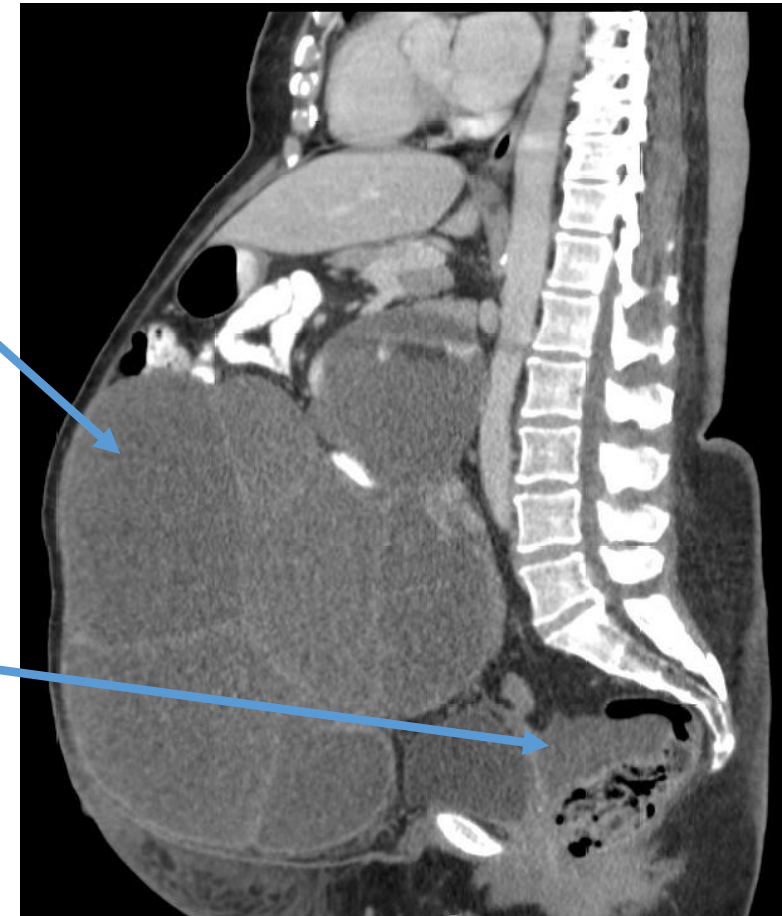
List of imaging studies

- CT Abdomen and Pelvis with contrast
- PET-CT skull base to thigh

CT Abdomen and Pelvis with contrast

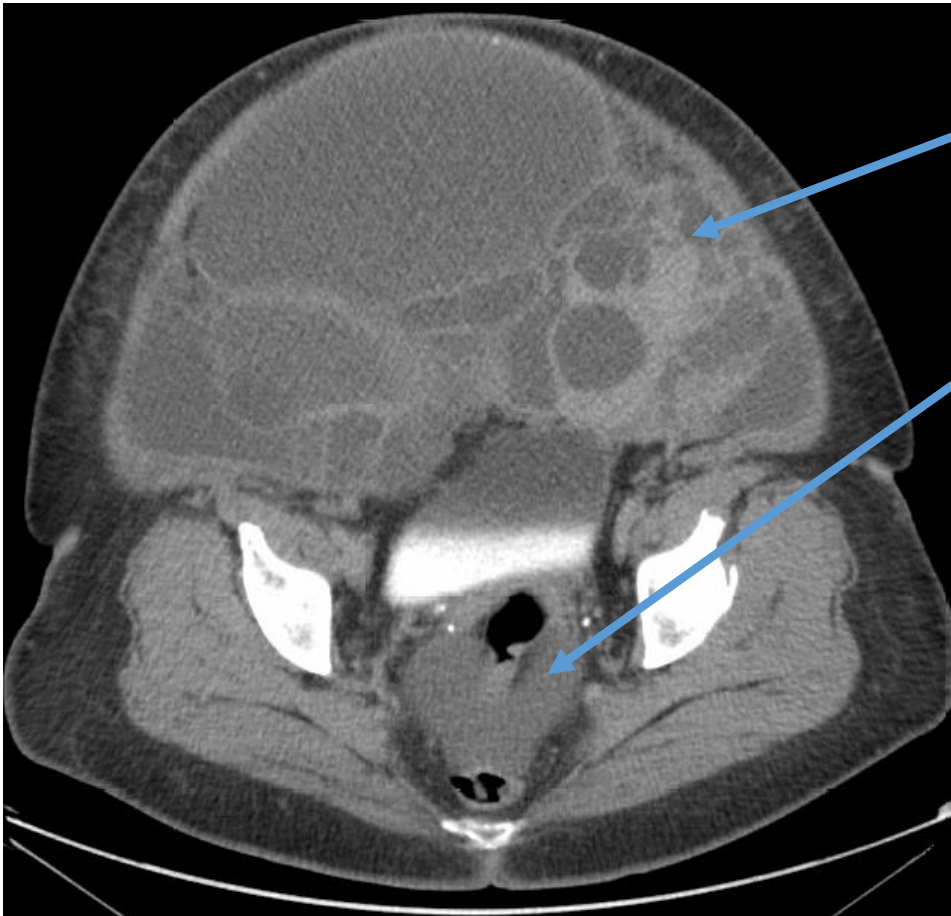
- Large multiloculated mixed cystic lesion of the lower abdomen and pelvis, likely arising from adnexa.
- Uterus surgically absent and ovaries not clearly identified.
- Small amount of free fluid in pelvis.

Sagittal



CT A/P with contrast continued

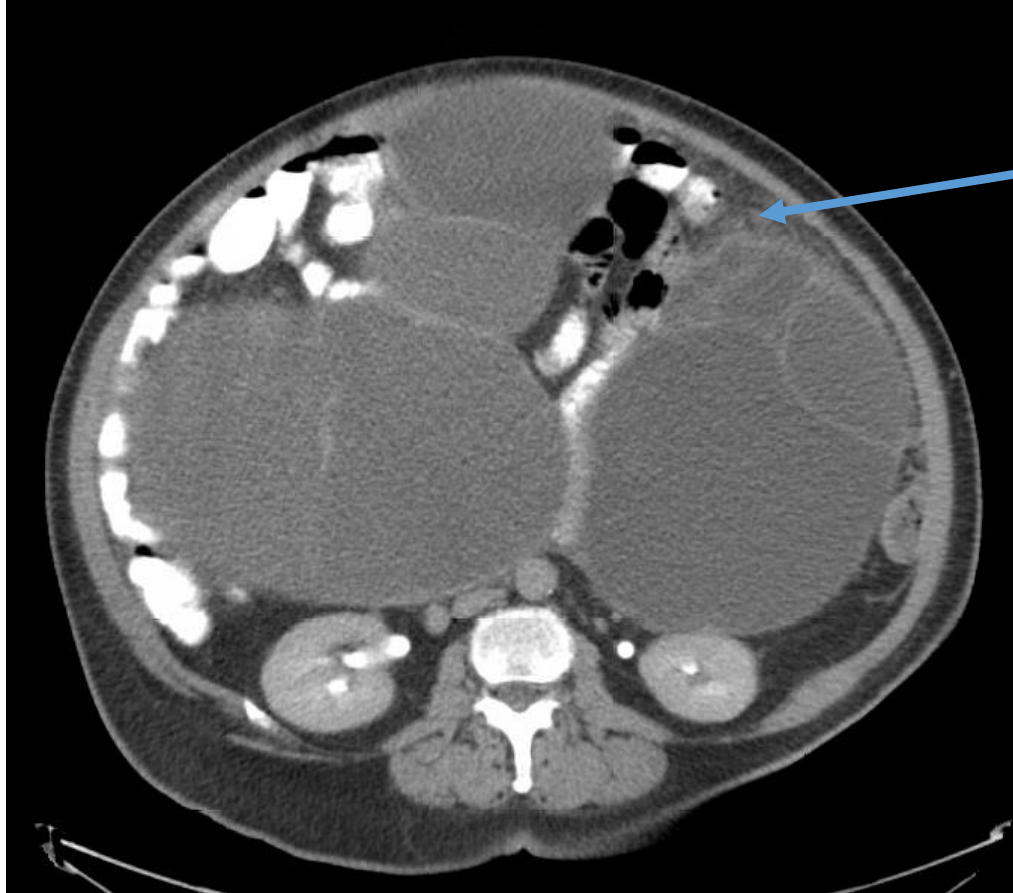
Axial



- Numerous linear septations and areas of mural nodularity and thickening.
- Small amount of free fluid in pelvis

CT A/P with contrast continued

Axial

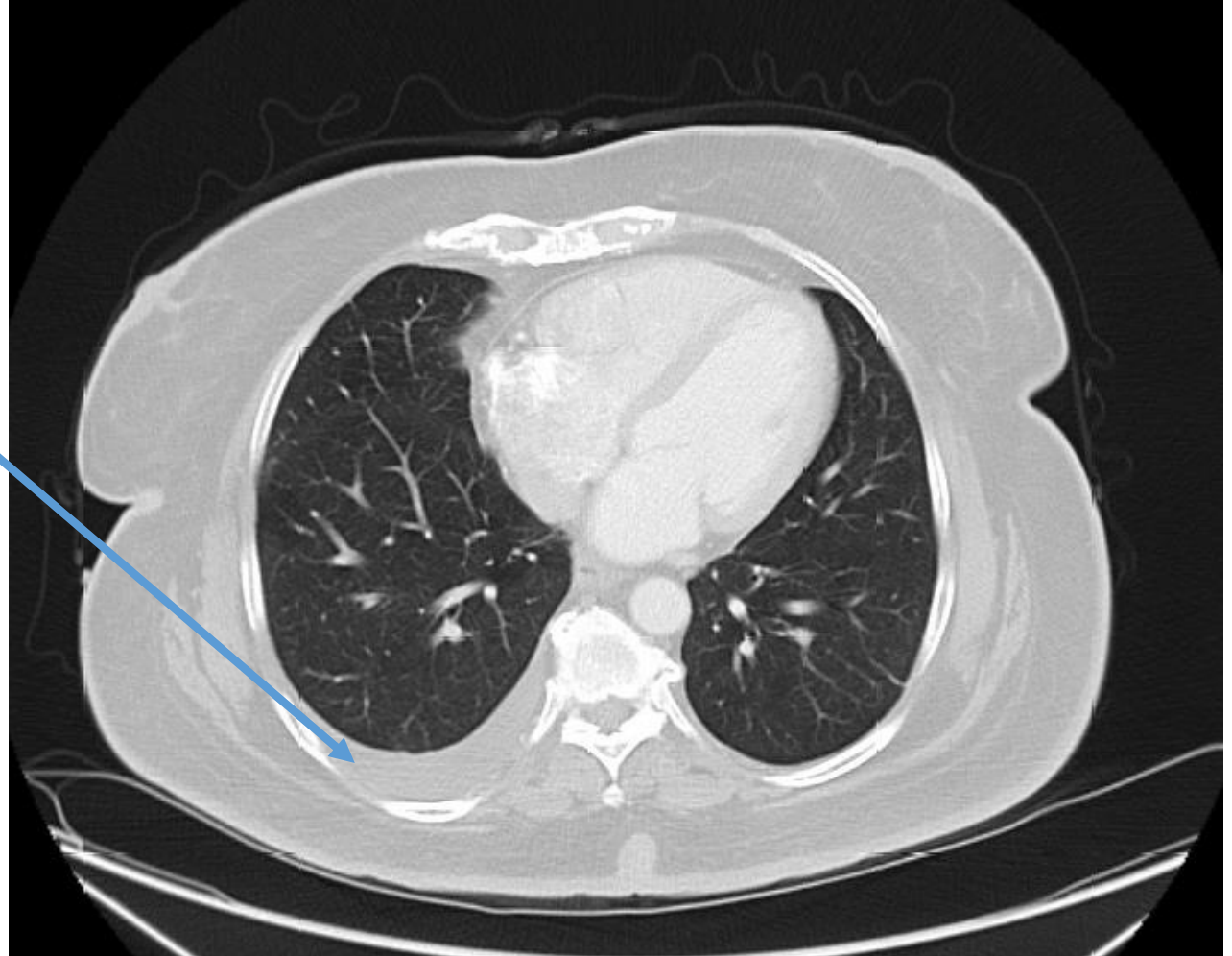


- Subtle fat stranding in the omentum that could reflect early omental metastases

CT A/P with contrast continued

Axial

- Small right pleural effusion



PET CT skull base to thigh

- Underwent exploratory laparotomy, bilateral salpingo-oophorectomy, and appendectomy.
- PET-CT performed for 6-month follow-up: No findings to suggest recurrent ovarian cancer or metastatic disease.



What is on your differential
diagnosis?

Differential Diagnosis

- Mucinous cystadenoma - multilocular cysts with loculi of variable intensities
- Mucinous cystadenocarcinoma - similar in appearance to cystadenoma
- Serous cystadenoma - unilocular thin-walled cyst
- Serous cystadenocarcinoma - cystic mass with solid portion, often bilateral
- Krukenberg tumor
- Clear cell carcinoma
- Brenner tumor
- Appendiceal mucinous neoplasm
- GI tract mucinous adenocarcinoma
- Endometrioma

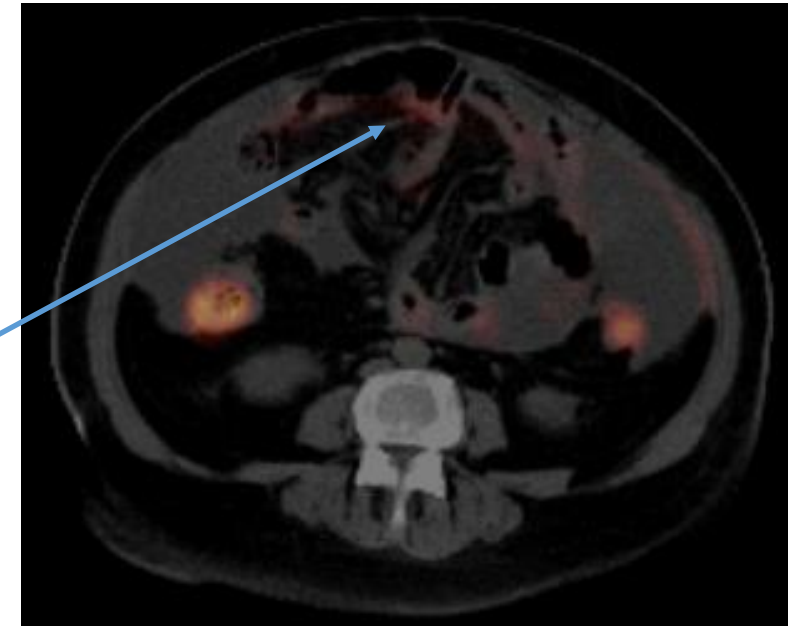
Patient treatment or outcome

- Surgical Pathology: Stage I mucinous carcinoma of the ovary
- Genetic testing for hereditary cancer risk syndrome was normal.
- Left breast lumpectomy for Infiltrating Ductal Carcinoma
- Underwent chemotherapy with agents active against both breast and ovarian cancer. Radiation to chest wall.
- During treatment course, patient developed back pain that radiated down to foot, initially thought to be a herniated disk.
 - PET-CT ordered to assess for possible disease progression

PET-CT Skull base to thigh (8 months after prior PET)



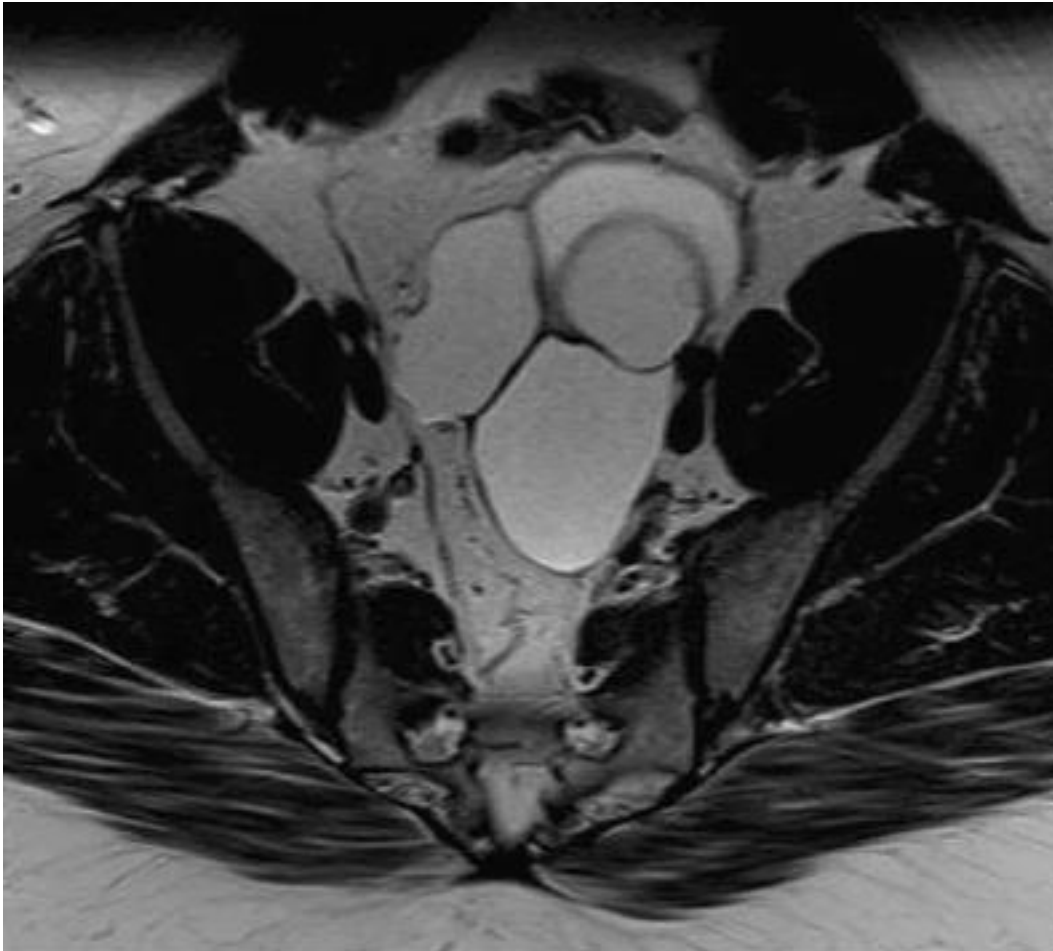
- Compared to prior PET-CT, there are numerous new foci of abnormal radiotracer activity within the bones, spine, and multiple ribs.
- Abnormal uptake outlines peritoneum and omentum.
- Increased ascites.
- Tiny pulmonary nodules within right lung.



Ovarian Mucinous Carcinoma

- Make up 10-15% of ovarian neoplasms.¹
- Can be benign, borderline or malignant.¹
 - 80% are benign, ~16% borderline
- Commonly in women 20-40 years old.¹
- Average size at presentation is 18 cm, present with nonspecific pelvic symptoms.¹
- Imaging commonly includes ultrasound and MRI
 - Ultrasound: multilocular cystic mass of varying complexity
 - MRI:
 - T1-weighted fat saturated sequences, post-contrast demonstrate cyst wall thickening, septa and internal solid components.²
 - T2- depending on differing mucin concentration within locules can result in “stained glass appearance”²
- Surgical resection is gold-standard treatment. Adjuvant chemotherapy in rare case of mucinous carcinoma with extraovarian disease.^{1, 13}

Classic appearance on MRI T2



- Variable signal intensities of the locules
- “Stained glass window appearance”.⁷

Image source: *Lee et al.*

ACR Appropriateness Criteria

Variant 1:

Clinically suspected adnexal mass, no acute symptoms. Premenopausal. Initial imaging.

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|--------------------------|--------------------------|
| US duplex Doppler pelvis | Usually Appropriate | ○ |
| US pelvis transvaginal | Usually Appropriate | ○ |
| US pelvis transabdominal | Usually Appropriate | ○ |
| MRI pelvis without and with IV contrast | May Be Appropriate | ○ |
| MRI pelvis without IV contrast | May Be Appropriate | ○ |
| CT pelvis with IV contrast | Usually Not Appropriate | ⊗⊗⊗ |
| CT pelvis without and with IV contrast | Usually Not Appropriate | ⊗⊗⊗⊗ |
| CT pelvis without IV contrast | Usually Not Appropriate | ⊗⊗⊗ |
| FDG-PET/CT skull base to mid-thigh | Usually Not Appropriate | ⊗⊗⊗⊗ |

Cost:

- CT A/P with Contrast: ~ \$,1,340. ⁸
- PET/CT: ~ \$4,637. ⁸

Based on these criteria, the patient should have had US or MRI first. However, the clinician had a high suspicion for ovarian cancer given the patients family history and exam findings. CT is recommended for ovarian cancer staging and may be why this was first modality chosen.

UNC Top Three

- Mucinous neoplasms of the ovary make up 10-15% of ovarian neoplasms and the majority are benign or borderline.
- Imaging evaluation typically involves ultrasound and MRI with findings of a large, unilateral, multiloculated cystic mass.
- Gold-standard treatment is surgical resection, with good prognosis for majority of benign and borderline cases.

References

1. 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.
2. Laurent PE, Thomassin-Piana J, Jalaguier-Coudray A. Mucin-producing tumors of the ovary: MR imaging appearance. Diagn Interv Imaging. 2015 Nov;96(11):1125-32. doi: 10.1016/j.diii.2014.11.034. Epub 2015 Mar 6. PMID: 25753545.
3. Babaier A, Ghatage P. Mucinous Cancer of the Ovary: Overview and Current Status. Diagnostics (Basel). 2020 Jan 19;10(1):52. doi: 10.3390/diagnostics10010052. PMID: 31963927; PMCID: PMC7168201.
4. Arora T, Mullangi S, Lekkala MR. Ovarian Cancer. [Updated 2023 Jun 18]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK567760/>
5. Yacoub JH, Clark JA, Paal EE, Manning MA. Approach to Cystic Lesions in the Abdomen and Pelvis, with Radiologic-Pathologic Correlation. Radiographics. 2021 Sep-Oct;41(5):1368-1386. doi: 10.1148/rg.2021200207. PMID: 34469214; PMCID: PMC8415047.
6. Cho KC, Gold BM. Computed tomography of Krukenberg tumors. AJR Am J Roentgenol. 1985 Aug;145(2):285-8. doi: 10.2214/ajr.145.2.285. PMID: 2992252.
7. Lee SS, Dyer RB. The stained glass window appearance. Abdom Radiol (NY). 2016 Feb;41(2):342-3. doi: 10.1007/s00261-015-0551-4. PMID: 26867920.
8. Mdsave: <https://www.mdsave.com/f/procedure/ct-scan-of-abdomen-and-pelvis-with-and-without-contrast/27704?q=ct+scan+of+abdomen+and+pelvis+with+and+without+contrast&name=CT+Scan+of+Abdomen+and+Pelvis+with+and+without+Contrast&latLng=36.03767%2C-78.86822&city=Durham&state=NC&zip=27704&page=2>
9. Craig O, Salazar C, Gorringer KL. Options for the Treatment of Mucinous Ovarian Carcinoma. Curr Treat Options Oncol. 2021 Nov 13;22(12):114. doi: 10.1007/s11864-021-00904-6. PMID: 34773517.