**Mucinous Carcinoma of the Ovary: A Rare Histotype and Incidental Occurrence of Synchronous Primary Gynecological Malignancies**

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### Introduction

- Ovarian cancer is the most lethal and second most common gynecological cancer.
- Mucinous carcinomas of the ovary are a rare, malignant histotype of epithelial ovarian cancer.
- Metastatic mucinous carcinomas to the ovary are more common than primary mucinous carcinomas of the ovary, with gastrointestinal (GI) and pancreaticobiliary tract origins accounting for the majority of cases.
- Primary ovarian mucinous carcinomas account for approximately 5% of mucinous tumors and 3% of ovarian cancers.
- Approximately 70-80% of all gynecologic tumors are synchronous primary malignancies.
- Synchronous ovarian and endometrial cancers are detected in 3.3-5.0% of endometrial cancer patients and 2.7-10.0% of ovarian cancer patients.
- The U.S. Preventive Services Task Force does not recommend screening the general population for ovarian cancer.
- Risk factors include low parity, early menarche, late menopause, estrogen replacement therapy for 5+ years, genetic syndromes (i.e., Lynch syndrome), BRCA gene mutations or family history suggesting genetic predisposition, and obesity.
- Patients may be asymptomatic; presenting symptoms are non-specific, including fatigue, abdominal fullness, constipation, back pain, nausea, pelvic pain, and urinary symptoms.
- Laboratory testing, such as a CBC, CMP, and serum CA-125 level, should be performed if a patient presents with non-specific symptoms.
- Transvaginal ultrasonography is the first line of imaging used to evaluate an adnexal mass; MRI is helpful to assess further indeterminate masses.

### History

- A 51-year-old G3P2012 female presented to the clinic with a chief complaint of intermittent post-menopausal bleeding for two weeks.
- Patient reported having gone through menopause around the age of 46 and had been on hormonal replacement therapy for five years. She reported a 13-14 year history of oral contraceptive use.
- She denied recent weight loss, fevers, chills, night sweats, abdominal bloating, cramping, or foul discharge odor.
- Past medical history: diverticulosis, Hashimoto’s thyroiditis, colonic polyps.
- Past surgical history: coloscopy.
- Family history: lymphoma (father), melanoma (maternal aunt), breast cancer (cousin), cervical cancer (cousin).
- Social history: alcohol socially, denies tobacco or recreational drug use.
- Medications: cholecalciferol 50 mcg tablet PO once daily; levothyroxine 100 mcg tablet PO once daily.

### Physical Exam

- Vital signs: BP 116/74 mmHg; Pulse: 84 bpm; Respirations: 14 breaths per minute; Temperature: 97.3°F; SpO2: 98% (oxygen) on room air.
- Alert, well-appearing female, not in acute distress.
- Abdomen soft, non-tender, non-distended, non-elevated bowel sounds.
- Normally developed female genitalia with no external lesions or eruptions.
- Speculum exam revealed a small amount of bright red blood from cervical orifice.
- No lesions, erythema, edema, or tenderness of vagina or cervix.
- Bimanual and rectovaginal exam failed to reveal any palpable masses or nodules.
- Uterus was midline, smooth, not enlarged, and mobile.
- No palpable inguinal lymph nodes.
- Remainder of physical exam was within normal limits.

### Diagnostic Results

- Abdominal ultrasound: complex cystic and solid left adnexal mass measuring up to 13.9 cm; endometrial thickening with increased vascularity with the maximum endometrial thickness measured 17.1 mm; 41 mm right unicocular, anechoic, avascular ovarian cyst; no free fluid seen in the pelvis or upper abdomen.
- Endometrial biopsy: fragmented endometrium containing focal atypical papillary proliferation.
- CA-125 and CEA values were within the normal range preoperatively.
- BRCA testing negative.
- Routine complete blood count and chemistries were within normal range.
- Surgical procedure: exploratory laparoscopy, robotic-assisted hysterectomy, bilateral salpingo-oophorectomy, tumor debulking.

### Case Outcome

- Final diagnosis: left ovarian mucinous carcinoma stage IC3 shown in Figures 1 and 2; endometrial adenocarcinoma stage IA; right ovarian clear cell adenofibroma with borderline features.

**Recommended Treatment for Ovarian Mucinous Carcinoma**

- National Comprehensive Cancer Network guidelines recommend either observation or systemic treatment as adjuvant treatment for stage IC mucinous carcinoma of the ovary.
- Patient was in favor of chemotherapy over observation.
- Yale tumor board consensus opinion: FOLFOX and Avastin every fourteen days for twelve cycles.
- Prognosis for patients with stage IC mucinous carcinoma of the ovary is about 94.1%.

### Conclusion

- Mucinous carcinomas of the ovary are a rare histotype of epithelial ovarian cancer.
- A thorough histologic, clinical, radiographic, and pathologic evaluation must be performed to establish the correct diagnosis and staging of ovarian cancer.
- Given the predominance of mucinous carcinomas in the GI tract, a GI workup should be performed to rule out metastasis to the ovary.
- Although mucinous carcinomas of the ovary are rare, providers must be cognizant of the differences in diagnosis and management compared to other ovarian neoplasms.

### Table 1. Differential Diagnosis of Adnexal Mass

<table>
<thead>
<tr>
<th>Primary ovarian carcinoma</th>
<th>Metastatic carcinoma to the ovaries.</th>
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</thead>
<tbody>
<tr>
<td>Benign ovarian tumor</td>
<td>Functional ovarian cyst</td>
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<tr>
<td>Endometrioma</td>
<td>Ovarian torsion</td>
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<tr>
<td>Endometriosis</td>
<td>Tubo-ovarian abscess</td>
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<tr>
<td>Uterine fibroid</td>
<td>Ectopic pregnancy</td>
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### References

- [BRCA testing](https://www.cancer.org/cancer/ovarian-cancer/understanding-ovarian-cancer/brca-testing.html).

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**Fig 1. Gross Image of Left Adnexal Mass**

**Fig 2. Histopathology of Adnexal Biopsy**