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CASE REPORT

A Synchronous Occurrence of Serous and Mucinous Cystadenomas of the Ovaries: Case Report and Review of the Literature

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Video Abstract

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Background: Ovarian neoplasms are common gynecological tumors, with epithelial tumors accounting for the majority of cases. While serous and mucinous cystadenomas are frequent individually, the synchronous occurrence of different epithelial subtypes in bilateral ovaries is extremely rare.

Case Presentation: We report a 55-year-old postmenopausal woman presenting with lower abdominal pain, swelling, nausea, vomiting, and unintentional weight loss. Imaging revealed a large multiloculated cystic pelvic mass. Serum CA-125 was normal. The patient underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy. Histopathology demonstrated a left ovarian mucinous cystadenoma and a right ovarian serous cystadenoma. The uterus, cervix, and fallopian tubes were unremarkable. The patient recovered well postoperatively and remains on regular follow-up.

Discussion: The simultaneous presence of distinct epithelial ovarian tumors in bilateral ovaries is rare, with limited reports in the literature. Preoperative imaging may suggest unilateral involvement, potentially masking the coexistence of multiple histologies. Intraoperative frozen section analysis, when available, can guide surgical decision-making and potentially prevent unnecessary removal of additional structures.

Conclusion: Clinicians should consider the possibility of synchronous ovarian epithelial tumors in differential diagnoses of ovarian masses. Accurate diagnosis relies on thorough clinical evaluation, imaging, and histopathological correlation. Surgical management followed by careful follow-up is effective for benign synchronous ovarian tumors.

Keywords: ovarian neoplasm, serous cystadenoma, mucinous cystadenoma, synchronous tumors, bilateral ovarian tumors

Key Learning Points

- The rarity of synchronous serous and mucinous cystadenoma of the ovaries can mask clinical and radiological suspicion; therefore, it should be considered in the differential diagnosis of ovarian masses.
- Access to intraoperative frozen section analysis provides valuable preliminary results and assists surgeons in making informed surgical decisions.
- Given their benign nature, synchronous ovarian epithelial tumors of different histologies can be successfully treated with surgery followed by regular follow-up.

Introduction

Ovarian neoplasms are the second most common gynecological tumors and remains one of the leading causes of death worldwide.[1] In general, ovarian tumors, particularly malignant lesions, are predominantly diseases of postmenopausal

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women, with a median age of 60–65 years for epithelial ovarian tumors and only 10–15% occurring in premenopausal women.[2] According to the Global Cancer Observatory 2022 report, the incidence of ovarian cancers in Rwanda is estimated at 5%, with approximately 193 new cases reported annually and a 5-year prevalence of 434 cases per 100,000 population (6.3%).[3]

Ovarian tumors of epithelial origin are thought to arise from metaplastic change of the ovarian surface epithelium (mesothelium) or from small epithelial inclusion cysts.[4] The ovarian surface epithelium has the potential to differentiate into serous, mucinous, clear cell, endometrioid, and transitional (urothelial) tumors. In developed countries, more than 90% of malignant ovarian tumors are of epithelial origin, whereas sex cord-stromal tumors account for approximately 5–6% and germ cell tumors for 2–3%.[5,6] Serous and mucinous cystadenomas are the most common epithelial tumors, comprising about 30% of all ovarian neoplasms.[7]

While the synchronous growth of two different epithelial tumor types within the same ovary is a recognized phenomenon, the occurrence of two distinct surface epithelial tumors in the right and left ovaries is exceedingly rare. Such cases pose unique diagnostic and therapeutic challenges, as their pathogenesis, clinical behavior, and prognostic implications remain poorly understood.[8] It has been hypothesized that these tumors may develop independently through distinct molecular or genetic pathways, or result from shared predisposing factors such as chronic inflammation, hormonal influences, or genetic susceptibility, though definitive mechanisms remain unclear.[9]

Clinically, these rare presentations are significant because they can complicate preoperative assessment, imaging interpretation, and surgical planning. Histopathological evaluation remains the gold standard for accurate diagnosis, which is critical for guiding appropriate management and counseling regarding prognosis. Recognizing and reporting such unusual cases contributes to a better understanding of ovarian tumor biology, helps refine diagnostic strategies, and may inform individualized treatment approaches in the future.

This case report describes the clinical presentation, diagnostic approach, and management of a patient with bilateral, histologically distinct ovarian epithelial tumors, highlighting the importance of thorough pathological assessment and the challenges associated with these rare neoplasms.

Case Presentation

A 55-year-old postmenopausal woman, G3P3002, presented to the gynecology outpatient clinic at the University Teaching Hospital of Kigali (CHUK) with a 2-month history of lower abdominal pain and swelling, associated with nausea, vomiting, and an unintentional weight loss of 5 kg. Her past medical history was significant for hypertension, well controlled on medication for 3 years. On physical examination, her blood pressure was 136/89 mmHg, heart rate 86 bpm, and respiratory rate 18 breaths per minute. The abdomen was distended with a tender hypogastrium and dullness on percussion, suggestive of an underlying mass or ascites. A mobile, firm, non-pulsatile mass was palpated in the lower abdomen, extending above the umbilicus. On digital vaginal examination, the cervix appeared smooth with no palpable adnexal mass or cul-de-sac nodularity. A bedside transabdominal ultrasound revealed a large, multiloculated, predominantly cystic pelvic mass with thin septations and hypoechoic areas, without obvious solid components or papillary projections. Doppler assessment demonstrated no significant vascular flow within the septations or cyst walls. No ascites or additional abnormalities were detected. Serum CA-125 level was 7.8 U/mL. Abdominopelvic CT demonstrated a multiseptated cystic pelvic mass (Figure 1A–D).

A total abdominal hysterectomy with bilateral salpingo-oophorectomy was discussed with the patient, with surgical planning contingent on intraoperative findings. Following informed consent, surgery was performed. Uterine and adnexal specimens were submitted to the Department of Pathology at CHUK for histopathological evaluation. Gross examination revealed bilaterally cystically dilated ovaries. The left ovarian mass weighed 6.2 kg and measured 23 cm × 20 cm × 17 cm. Serial cut sectioning demonstrated a cystic cavity filled with yellowish gelatinous fluid. Microscopic examination of the left ovarian mass showed a cyst wall lined by simple columnar epithelium with apical mucin, resembling gastric foveolar or intestinal epithelium on hematoxylin and eosin (H&E) staining (Figure 2A). In contrast, the right ovarian mass revealed a cyst lined by simple ciliated epithelium ranging from flat to cuboidal, with focal epithelial stratification resembling fallopian tube lining (Figure 2B). Higher-magnification examination of the left ovarian mass demonstrated well-arranged columnar cells with basally located nuclei and apical mucinous cytoplasm (Figure 2C). Sections from the

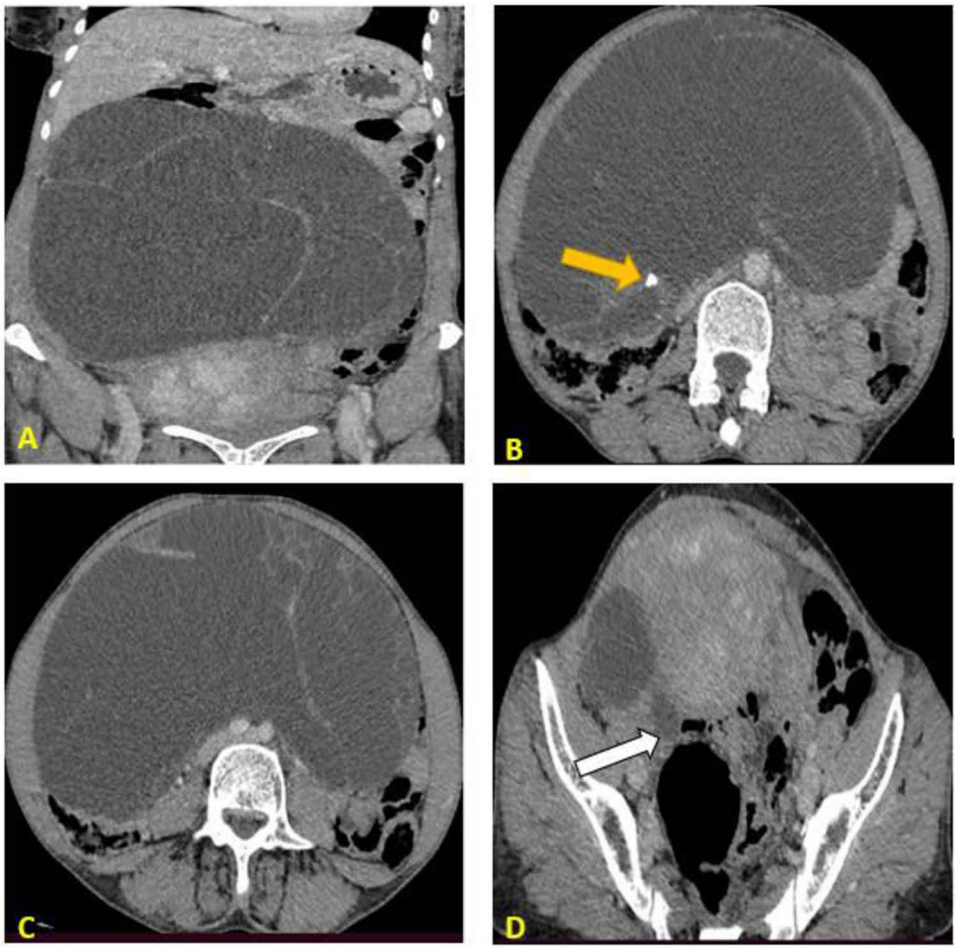

Figure 1 (**A**–**D**) Post contrast abdominopelvic CT scan revealing 22.6×20.9×13.9cm multiseptated pelvic mass extending until the level of the pancreas (**A**–**C**). Calcification is seen within the mass ((**B**) Yellow arrow). No solid component is present. Left ovary could not be defined separately from the mass. Small cystic lesion in the right adnexal area, representing right ovary ((**D**) White arrow).

right ovarian mass showed a frankly benign cuboidal to columnar ciliated epithelial lining with preserved polarity (Figure 2D). No nuclear atypia, cellular pleomorphism, or mitotic figures were identified. A diagnosis of synchronous left ovarian mucinous cystadenoma and right ovarian serous cystadenoma was made. The uterine body, cervix, and fallopian tubes were histologically unremarkable. The patient was placed on regular follow-up, with dramatic clinical improvement, and is currently doing well (Figure 2).

Discussion

We report a rare case of synchronous serous and mucinous cystadenomas in a 55-year-old woman. The patient's initial clinical presentation and imaging findings suggested a unilateral ovarian cyst. However, the absence of intraoperative frozen section analysis, combined with the large size of the left ovarian mass and intraoperative findings, raised a suspicion of malignancy. Consequently, a total abdominal hysterectomy with bilateral salpingo-oophorectomy was performed. In well-equipped centers, intraoperative frozen section consultation following ovarian mass excision could have confirmed the benign nature of both masses, potentially avoiding removal of the uterus and fallopian tubes and preserving reproductive and hormonal function when clinically appropriate.

Although uncommon, synchronous serous and mucinous cystadenomas should be considered in the differential diagnosis of ovarian masses to ensure optimal surgical planning and postoperative counseling. The occurrence of two different epithelial lesions of the ovary is independent of age, as reported in a 29-year-old woman by Sethi et al. The

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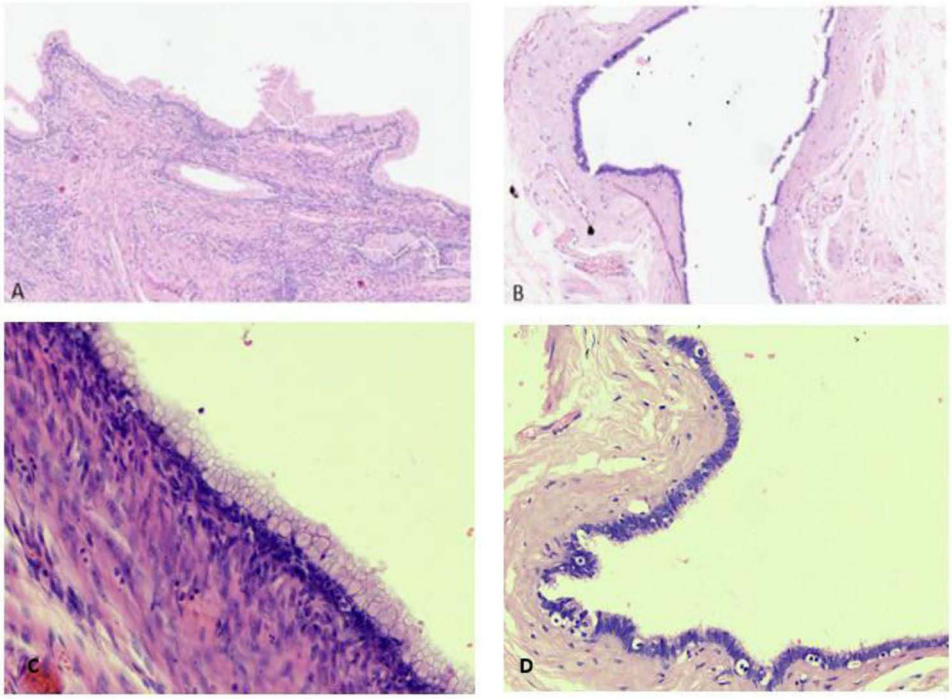

Figure 2 Histopathological features of bilateral ovarian cystadenomas. (**A**) Left ovarian mucinous cystadenoma lined by columnar epithelial cells with apical mucin (H&E stain; ×40). (**B**) Right ovarian serous cystadenoma lined by cuboidal to columnar ciliated epithelial cells resembling fallopian tube epithelium (H&E stain; ×40). (**C**) Higher-magnification view of the mucinous cystadenoma (H&E stain; ×400). (**D**) Higher-magnification view of the serous cystadenoma (H&E stain; ×400).

serum CA-125 marker was slightly elevated at 38 U/mL. She presented with right iliac fossa pain, which was initially mistaken for ectopic pregnancy. Unilateral pain should not prevent the clinician from considering bilateral neoplasms.[7]

Benign ovarian tumors represent the majority of ovarian lesions, accounting for approximately 80% of all cases,[10] with surface epithelial tumors constituting the most prevalent subtype.[11] Despite their benign nature, some studies suggest that certain benign ovarian tumors may be associated with an increased risk of subsequent ovarian malignancy, highlighting the importance of careful histopathological assessment.[12]

Histological subtypes of epithelial tumors include serous, mucinous, endometrioid, clear cell, and Brenner tumors. Serous cystadenomas account for approximately 40% of all ovarian tumors and are typically unilateral in 90% of cases.[13] Mucinous cystadenomas comprise 20–25% of benign ovarian tumors.[14] The synchronous presence of both serous and mucinous cystadenomas is exceedingly rare,[7] and even more unusual is the occurrence of distinct epithelial tumors in bilateral ovaries. Nonetheless, a limited number of cases documenting combinations of serous and mucinous cystadenomas in opposite ovaries have been reported,[5–7,15] emphasizing the need for clinicians to maintain a high index of suspicion.

From a clinical perspective, recognizing the possibility of synchronous, histologically distinct ovarian tumors has several important implications. First, it underscores the necessity of comprehensive preoperative evaluation, including imaging and tumor markers, although these may not reliably distinguish between benign and malignant lesions. Second, it highlights the value of intraoperative frozen section analysis where available, which can guide the extent of surgery and minimize overtreatment. Finally, understanding the rare but documented coexistence of different epithelial tumors may inform follow-up strategies and patient counseling regarding prognosis, recurrence risk, and potential genetic predispositions.

This case adds to the growing body of literature on synchronous ovarian epithelial tumors and reinforces the importance of thorough histopathological examination to accurately identify rare presentations, optimize surgical management, and guide patient-centered care.

Conclusion

The coexistence of bilateral epithelial ovarian tumors with different histological subtypes is rare and, to our knowledge, has not been previously reported in Rwanda. Comprehensive history taking, meticulous physical examination, and correlation with radiological and histopathological findings are crucial for diagnosing the co-occurrence of different epithelial ovarian tumors and guiding appropriate management. The availability of intraoperative frozen section analysis can significantly aid in evidence-based surgical decision-making by providing preliminary result intraoperatively.

Data Sharing Statement

The data underlying this study will not be shared publicly because of restrictions related to patient confidentiality and institutional policy at the University Teaching Hospital of Kigali. Deidentified data may be made available upon reasonable request to the corresponding author (evodembabazi@gmail.com), subject to approval by the local Institutional Review Board.

Ethics and Consent

Ethical approval and permission for data access, collection and publication from local institution was required and granted by the Research and Ethics Committee at the University Teaching Hospital of Kigali (CHUK) under the following reference: Ref: EC/CHUK/CR/004/2025. Patient confidentiality was maintained by anonymizing all data. Written informed consent for the case details to be published was obtained, and the authors are prepared to provide a signed copy to the journal's editorial team upon request. This case report was conducted in accordance with the principles outlined in the Declaration of Helsinki.

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Disclosure

The authors declare that they have no competing interests in this work.

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