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Case Report

Borderline seromucinous tumor with pre-existing endometriosis - A case report

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ABSTRACT

The ovary is a common location for endometriosis, characterized by the presence of endometrial glands outside the uterus. Research has established a link between ovarian endometriosis and the coexistence of borderline seromucinous tumors, which have a low malignant potential and exhibit papillary structures similar to serous borderline tumors. We present a case study of a unmarried, 23-year-old female who experienced spotting, pelvic pain, weakness, and fatigue for a month. Ultrasound examination revealed an enlarged and multiloculated ovary with elevated CA-125 levels. Following a right-sided oophorectomy, histopathological analysis confirmed the diagnosis of borderline seromucinous tumor accompanied by endometriosis. This case supports the finding that borderline seromucinous tumors can occur simultaneously or subsequently with ovarian endometriosis

1. Introduction

Ovarian endometriosis, characterized by the presence of endometrial glands and stroma outside the uterus, is commonly associated with infertility and remains active during childbearing years. The most common symptom is menstrual cycle-related pain. Notably, Borderline Seromucinous Tumors (BSTs) often coexist with ovarian endometriosis, sharing a strong association (30-70%).[1] Although endometriosis is typically non-cancerous, it's linked to a higher risk of certain cancers, including a specific type of ovarian cancer called endometriosis-associated ovarian cancer (EAOC). Women with endometriosis are more likely to develop ovarian cancer, especially endometrioid and clear-cell carcinomas. To combat this, it's essential to understand the factors that contribute to the development of cancer in endometriosis, such as hormonal imbalances, reproductive history, environmental exposures, and genetic predisposition.[2] Research has made significant progress in identifying key genetic mutations, microRNAs, and tumor microenvironmental factors that impact critical pathways, including PI3K/AKT/mTOR, DNA repair mechanisms, oxidative stress, and inflammation.[2] By uncovering these risk factors, we can better tackle the malignant transformation of endometriosis.

2. Case Report

A 23 years old unmarried female presented with spotting post menses, pelvic pain, weakness and fatigue since 1 month. On USG examination, ovary appeared bulky and multiloculated. Her serum CA 125 levels were higher than normal range. Right sided oophorectomy was performed and the specimen was sent for HPE analysis. Grossly, a 6x4x1cm sized, large, multiloculated cyst with papillary structures protruding within it and containing serosanguinous fluid was observed. Another smaller cyst from the same ovary was found measuring

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4x2x2cm and containing hemorrhagic fluid on cut section, was received. Representative sections were taken and the tissue was further processed by routine paraffin embedding technique and stained with H & E stain. On histopathology examination, morphology of hemorrhagic ovarian cyst showed histomorphology of Endometriosis. The larger ovarian cyst showed histomorphological features of borderline seromucinous tumor.(Figures 1, 2, 3 and 4)

2.1. Microscopic examination

Sections reveal cyst with hierarchical branching papillae lined by cytologically bland cells of mixed Müllerian types. Stromal cores of papillae are edematous and fibrotic containing inflammatory cells. No evidence of stromal invasion is seen. Adjacent ovary reveals cystic follicles. Focally cysts lined by cuboid to columnar epithelium containing hemorrhagic material are seen. Sections from haemorrhagic cyst show cyst wall partially lined by endometrial epithelial layer with many hemosiderin laden macrophages. Stroma shows occasional endometrial glands and haemorrhage. Overall finding was reported as Borderline Seromucinous ovarian tumors with endometriosis.

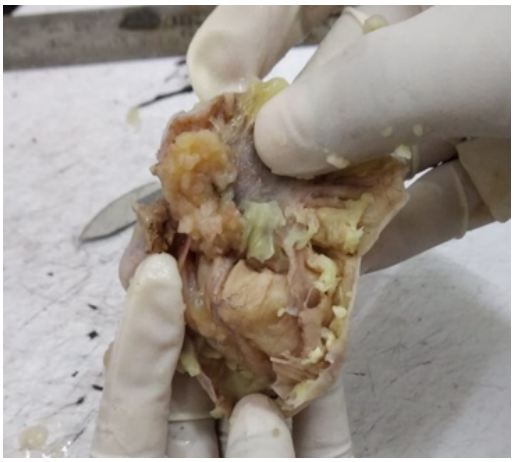

Figure 1: Gross appearance of small, multilocular cysts containing serosanguinous fluid with papillary projections on the inner surface. Note the thick, fibrous cyst wall on cut surface

Admixture of mucinous and some clear cells, with mild or moderate nuclear atypia and stratifications. Focal hobnail appearance is also seen

3. Discussion

In the 2014 WHO classification, seromucinous ovarian tumors were reclassified into a distinct category, separate from mucinous tumors that exhibit gastrointestinal features. Seromucinous tumors share three key characteristics:[3] frequent association with endometriosis (30-70%), bilateral involvement of the ovaries (20-40%), and[4,5] absence of

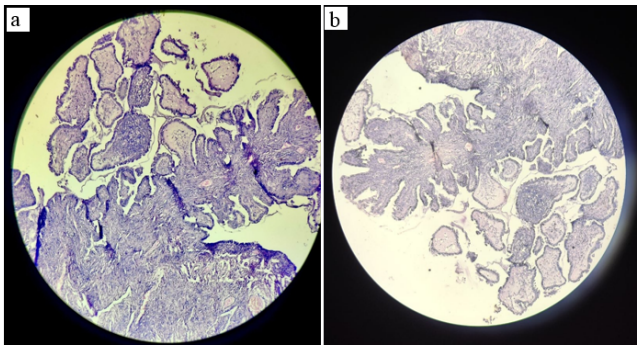

Figure 2: a,b : Showing hierarchical papillary structure of seromucinous borderline tumor

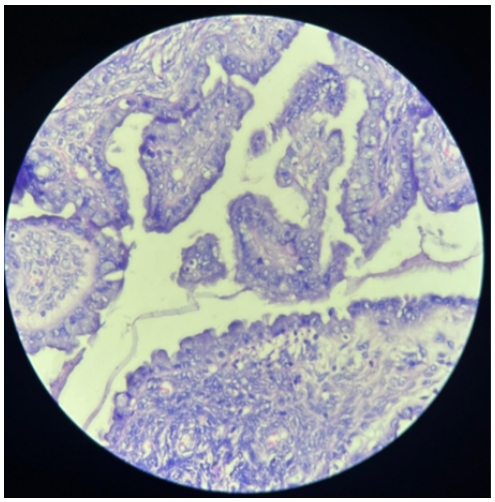

Figure 3: High power microscopic pictures showing a variety of cell types.

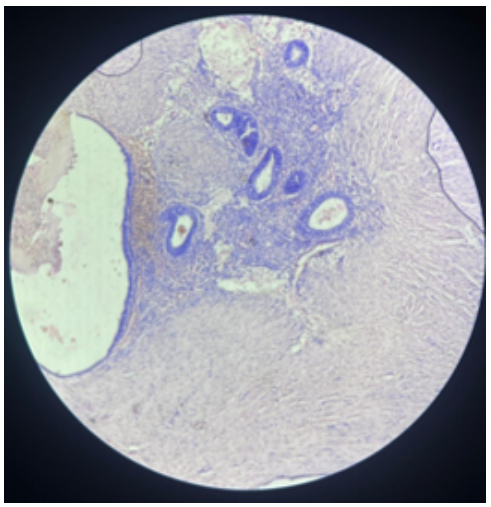

Figure 4: Ovarian endometriosis

gastrointestinal differentiation, unlike mucinous tumors which contain goblet or Paneth cells. The presence of gastrointestinal features excludes a seromucinous tumor diagnosis. Borderline seromucinous tumors (BSMTs) typically affect women in their early reproductive years (average age: early 30s) and are often smaller (8-10 cm in diameter) and less complex (unilocular or few locules) compared to Mucinous Borderline Tumors (MBTs). Additionally, BSMTs tend to be bilateral in 20-40% of cases, either simultaneously or metachronously. These tumors are papillary neoplasms comprising Müllerian-type epithelia without destructive invasion. These tumors, along with clear-cell (40-70%) and endometrioid carcinomas (30%) are classified as endometriosis-related ovarian neoplasms, highlighting their distinct pathological features. Genetic mutations in key genes like PTEN, CTNNB1, and PIK3CA are common in endometrioid and clear cell carcinomas. Notably, 46% of endometrioid and 30% of clear cell carcinomas show mutations in the ARID1A tumor suppressor gene, often accompanied by loss of BAF250a expression. Additional changes include loss of expression of DNA mismatch repair proteins, microsatellite instability, and altered expression of cell-cycle regulators and hormone receptors. These findings suggest a stepwise progression from endometriosis to cancer.

Endometriosis can rarely co-occur with other conditions, including peritoneal leiomyomatosis, glial implants, and splenosis. It may also be accompanied by endosalpingiosis, a condition characterized by benign tubal-type epithelium without endometrial stroma. To ensure accurate diagnosis, endometriosis must be distinguished from other ovarian and peritoneal lesions, such as infectious granulomas, palisading granulomas, and diathermy-related granulomas, which lack the pseudoxanthoma cells (Necrotic pseudoxanthoma nodule) typical of endometriosis. Endometriotic cysts may occasionally contain a rare feature: Liesegang rings, which can be found within their walls.[1]

Macroscopically, SMBTs appear as unilocular or oligolocular cysts, typically measuring 8-10 cm in diameter, with papillary projections lining the inner surface. The cyst wall is often thickened and fibrous. The cystic contents can vary, featuring hemorrhagic, serous, mucinous, or mucopurulent material, with the latter being common due to the presence of neutrophils.

Microscopically, Seromucinous Borderline Tumors (SMBTs) display a papillary structure with hierarchical branching, characterized by bulbous, edematous, or sclerotic stroma. Neutrophils and eosinophils are frequently observed in the stroma, epithelium, and luminal spaces. While the low-power architecture resembles Serous Borderline Tumors (SBTs) which shows similar morphology as papillary architecture but has single cell type and lacks other defined Müllerian cell types,[6] whereas in SMBTs, the lining cells are distinct, comprising a mix of epithelial cell types (at least two), including endocervical-type mucinous, ciliated, endometrioid, and indifferent eosinophilic cells, with variable proportions. Squamous, clear, and hobnail cells may also be present. Indifferent eosinophilic cells, characterized by abundant eosinophilic cytoplasm and central nuclei, are typically found at the papillary tips. Microglandular hyperplasia-like areas and subepithelial cuboidal cells may also be observed. If high-grade nuclear atypia is present without destructive invasion, it is classified as intraepithelial carcinoma. Microinvasion is defined as stromal invasion of less than 5 mm in greatest dimension, regardless of the number of foci. Tumors that exhibit microinvasion are categorized as Seromucinous Borderline Tumors (SMBTs) with microinvasion, denoted as 'SMBT with microinvasion.[7]

Unlike Mucinous Borderline Tumors (MBTs), Seromucinous Borderline Tumors (SMBTs) typically exhibit immunoreactivity for ER, progesterone receptor, and CA-125, but are negative for CK20 and CDX2. Similar to Intraductal Mucinous Borderline Tumors (IMBTs), SMBTs frequently harbor KRAS mutations and lack PTEN mutations, with common ARIDA mutations, akin to endometrioid carcinomas. SMBTs can be diagnosed through routine hematoxylin and eosin staining.[8] In our case we found that SMBT diagnosed at younger age, was of a smaller size and was associated with unilateral ovarian endometriosis & categorised as FIGO stage - IA.

4. Conclusion

The coexistence of borderline seromucinous tumor with endometriosis and elevated CA-125 levels is a notable finding, given the established association between endometriosis and clear cell or endometrioid carcinoma. This highlights the importance of thorough histopathological evaluation of every ovarian mass to accurately diagnose the specific ovarian tumor and identify any coexisting endometriosis, ensuring appropriate management and treatment.

5. Source of Funding

None.

6. Conflict of Interest

None.

References

1. Nagamine M, Mikami Y. Ovarian Seromucinous Tumors: Pathogenesis, Morphologic Spectrum, and Clinical Issues. *Diagnostics (Basel)*. 2020;10(2):77. doi:10.3390/diagnostics10020077.
2. Steinbuch S, Lüß AM, Eltrop S, Götte M, Kiesel L. Endometriosis-Associated Ovarian Cancer: From Molecular Pathologies to Clinical Relevance. *Int J Mol Sci*. 2024;25(8):4306. doi:10.3390/ijms25084306.
3. Rosai J. Uterus-Corpus . In: 9th, editor. Rosai and Ackerman's surgical pathology. Elsevier Health Sciences; 2011.

4. Dayal S. Ovarian endometriosis with borderline serous tumor association or coincidence - A case report and review of literature. *Indian J Med Paediatr Oncol*. 2020;41:406–8. doi:10.4103/ijmpo.ijmpo_209_18.
5. Nagayoshi Y, Yamada K, Yamada K, Fukasawa N, Kuroda T, Noguchi D, et al. Clinical Features of Borderline Ovarian Seromucinous Tumor. *Cancer Diagn Progn*. 2023;3(5):360–4.
6. Jagtap SV, Chavan V, Singh R, Ghadge N. Ovarian Low-Grade Papillary Serous Cystadenocarcinoma with Osseous Metaplasia- Case Report and Review of Literature. *Clin Pathol Res J*. 2024;8(1):000179. doi:10.23880/cprj-16000179.
7. Hauptmann S, Friedrich K, Redline R, Avril S. Ovarian borderline tumors in the 2014 WHO classification: evolving concepts and diagnostic criteria. *Virchows Arch*. 2017;470(2):125–42.
8. Ohnishi K, Nakayama K, Ishikawa M, Ishibashi T, Yamashita H, Nakamura K, et al. Mucinous borderline ovarian tumors with BRAFV600E mutation may have low risk for progression to invasive carcinomas. *Arch Gynecol Obste*. 2020;302(2):487–95.

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