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A Rare Ovarian Alliance: A Case Report on Coexistence of Benign Brenner Tumour and Mucinous Cystadenoma of the Ovary

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Abstract:
Brenner tumour of the ovary is a rare epithelial neoplasm accounting for approximately 2% of all ovarian tumours, most commonly seen in postmenopausal women and generally benign in nature. The coexistence of Brenner tumour with mucinous cystadenoma is distinctly uncommon, posing diagnostic and therapeutic challenges. We present the case of a 53-year-old postmenopausal woman with abdominal pain and altered bowel habits, ultimately diagnosed with a benign Brenner tumour coexisting with mucinous cystadenoma following surgical excision. This case highlights the enigmatic relationship between these tumours and underlines the importance of comprehensive histopathological evaluation and tailored surgical management.
Keywords: *Brenner tumour, ovary, epithelial neoplasm, ovarian tumours*

INTRODUCTION

Ovarian tumours represent a heterogeneous group of neoplasms with diverse morphology and biological behaviour. Among these, surface epithelial-stromal tumours form the majority, encompassing a wide spectrum from benign to malignant entities (1,2). Brenner tumours are uncommon surface epithelial-stromal neoplasms, first described in the late 19th century, and account for approximately 1–2% of all ovarian tumours (1,3). They are usually benign and occur predominantly in postmenopausal women, although borderline and malignant variants have also been reported (4,7,8).

Histologically, Brenner tumours are characterised by nests of transitional-type epithelial cells resembling urothelium, embedded in dense fibrous stroma, sometimes accompanied by mucinous or serous elements (1,6,9). Most cases remain asymptomatic and are incidentally detected during surgery or imaging performed for other reasons (6,10). Radiologically, these tumours often mimic other benign ovarian neoplasms, and definitive diagnosis requires histopathological confirmation.

Of particular clinical and pathological interest is the frequent coexistence of Brenner tumours with mucinous cystadenomas. Several studies and case reports have highlighted this association, suggesting either a coincidental finding or a common histogenetic pathway (5,11,12). Molecular studies have demonstrated shared mutations between the two components, supporting the theory of a monoclonal origin (12). The mucinous element often predominates, and in some instances, the Brenner component may be overlooked unless extensive sampling is performed (11,12).

From a regional perspective, ovarian cancer contributes significantly to the cancer burden in India, ranking among the leading malignancies in women in certain registries (4). While most of these are epithelial tumours of serous or mucinous subtype, rare entities such as Brenner tumour remain underreported. The rarity of this lesion, combined with its frequent coexistence with mucinous cystadenoma, highlights the importance of careful histopathological examination for accurate diagnosis and optimal management (3,5,11).

In the Indian context, reports of Brenner tumours remain limited to sporadic case reports, underlining their rarity and the importance of documentation (5,11,13). Understanding the coexistence of Brenner tumour with other ovarian lesions such as mucinous cystadenomas contributes not only to clarifying their pathogenesis but also to guiding appropriate management strategies. Each case adds valuable insight into the enigmatic relationship between these uncommon ovarian tumours. Therefore, we report a rare case of coexistence of mucinous cystadenoma with Brenner tumour in the ovary, with the aim of increasing awareness among pathologists and gynecologists regarding the possibility of such combined ovarian

neoplasms and the importance of careful histopathological evaluation for accurate diagnosis and management.

Case report

A 53-year-old postmenopausal woman, a known case of type 2 diabetes mellitus on regular treatment, presented to the outpatient department with complaints of intermittent pain in the lower abdomen, predominantly on the left side, for one year. The pain was dull aching in nature, non-radiating, and not associated with urinary complaints. She also reported altered bowel habits in the form of intermittent constipation and occasional loose stools, along with unintentional weight loss of approximately 5 kilograms over the preceding year. There was no history of per vaginal bleeding, abdominal distension, loss of appetite, or family history of gynaecological malignancy.

On clinical examination, the patient was moderately built and nourished, with stable vital signs. General examination did not reveal pallor, lymphadenopathy, or pedal oedema. Per abdominal examination showed mild tenderness in the left iliac fossa, without any palpable mass. Per speculum and bimanual pelvic examinations were unremarkable, except for a slight fullness in the left adnexal region.

Routine laboratory investigations including complete blood count, renal and liver function tests, and blood sugar profile were within normal limits. Serum tumour markers including cancer antigen-125 (CA-125), alpha-fetoprotein (AFP), and beta-human chorionic gonadotropin (β-hCG) were within reference range, while carcinoembryonic antigen (CEA) was mildly elevated at 4.5 ng/dl. Colonoscopy was performed due to bowel complaints and showed a small rectal polyp, which was excised completely; histopathology revealed no evidence of malignancy.

Contrast-enhanced computed tomography (CECT) of the abdomen and pelvis demonstrated a well-defined cystic lesion in the left adnexa measuring 5.6 × 4.1 × 6.4 cm, with internal septations indenting the uterus inferiorly. No ascites or lymphadenopathy was noted, and the appendix appeared grossly normal.

In view of the patient's age, menopausal status, symptoms, and the possibility of malignancy, a total abdominal hysterectomy with bilateral salpingo-oophorectomy was performed. The intraoperative findings included a cystic left ovarian mass without surface excrescences or peritoneal deposits. The appendix was inspected carefully and appeared normal; hence appendectomy was not performed **(Figure 1,2)**.

Gross examination of the resected specimen revealed a left ovarian cyst with a smooth outer surface. On sectioning, the cyst was multilocular with mucinous contents and focal solid areas. Microscopy showed features of a benign Brenner tumour composed of nests of transitional-type epithelial cells with oval nuclei, distinct nucleoli, and characteristic longitudinal nuclear grooves imparting a coffee-bean appearance, embedded within dense fibroblastic stroma. Adjacent areas revealed cysts lined by tall mucinous columnar epithelium with luminal eosinophilic secretions, consistent with a mucinous cystadenoma. No atypia, stromal invasion, or malignant features were identified **(Figure 3)**.

The postoperative period was uneventful, and the patient was discharged on the seventh day after surgery in stable condition. At follow-up after three months, she remained asymptomatic with no evidence of recurrence or complications. **Table 1** depicts a detailed summary of the case.

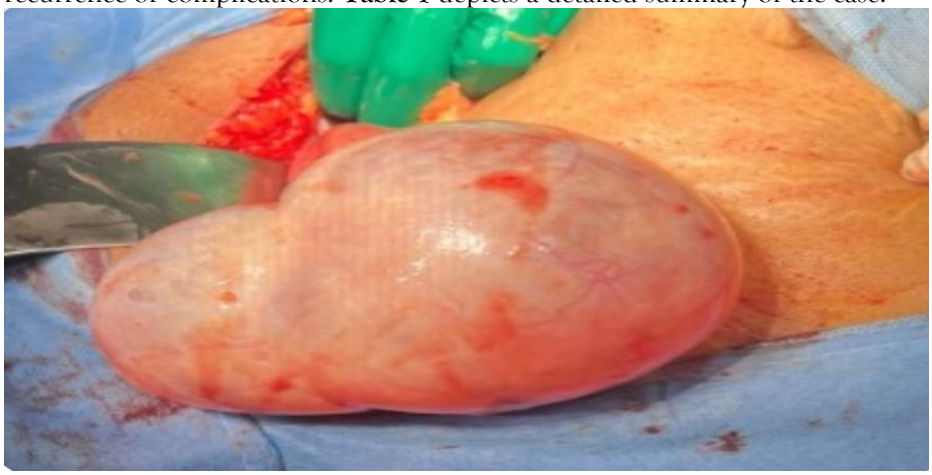

Figure 1. Intraoperative image of the left ovarian cystic mass showing a large, smooth-surfaced, tense cystic tumour being excised during total abdominal hysterectomy with bilateral salpingo-oophorectomy

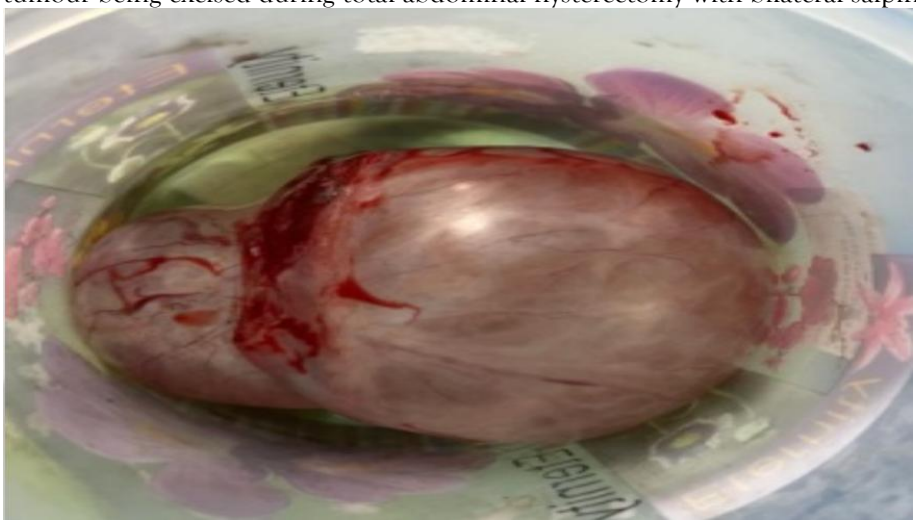

Figure 2. Gross specimen of the resected left ovarian cystic mass showing a smooth outer surface with focal vascular congestion, consistent with an ovarian mucinous cystadenoma coexisting with Brenner tumour

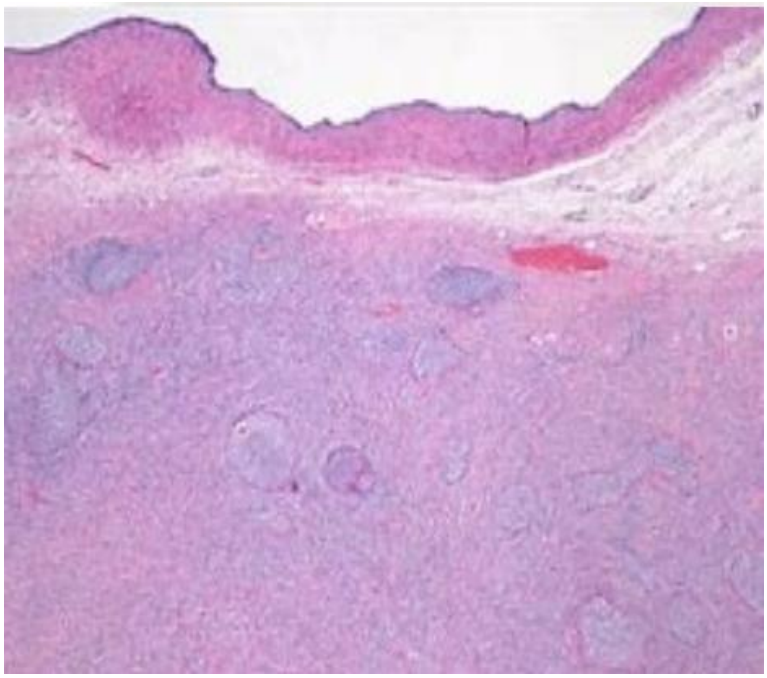

Figure 3. Histopathology of Brenner tumour (H&E, ×40) showing nests of transitional-type epithelial cells with characteristic nuclear grooves, embedded in a dense fibroblastic stroma

Table 1: Detailed Case Summary

Category	Findings
Age / Sex	53 years / Female (postmenopausal)
Comorbidities	Type 2 diabetes mellitus
Presenting complaints	Intermittent left lower abdominal pain (1 year), altered bowel habits, weight loss (~5 kg)
Clinical examination	Mild tenderness in left iliac fossa, adnexal fullness
Blood investigations	Normal limits

Tumour markers	CEA elevated (4.5 ng/dl); CA-125, AFP, β-hCG within normal range
Colonoscopy	Rectal polyp excised, benign
Imaging (CECT abdomen & pelvis)	Left adnexal cyst (5.6 × 4.1 × 6.4 cm) with internal septations indenting uterus; no ascites or lymphadenopathy
Surgery performed	Total abdominal hysterectomy with bilateral salpingo-oophorectomy
Intraoperative findings	Left ovarian cystic mass, no peritoneal deposits; appendix normal
Gross pathology	Multiloculated cyst with mucinous contents and focal solid areas
Histopathology	Benign Brenner tumour with nests of transitional cells in fibroblastic stroma; coexisting mucinous cystadenoma; no malignancy
Postoperative outcome	Uneventful recovery, discharged on day 7; asymptomatic at 3-month follow-up

DISCUSSION

Brenner tumours are rare surface epithelial–stromal neoplasms of the ovary, comprising about 1–2% of all ovarian tumours (1,2). Most cases are benign, though borderline and malignant variants have been documented (3,7). They are most often diagnosed in postmenopausal women, usually as incidental findings during surgery or imaging performed for unrelated conditions (6,10,13). Histologically, Brenner tumours show transitional-type epithelial nests embedded in dense fibrous stroma, often with characteristic "coffee-bean" nuclear grooves (1,8,9).

A noteworthy feature of Brenner tumours is their frequent coexistence with mucinous neoplasms. Several studies and case reports have highlighted this association, suggesting either a coincidental occurrence or a shared histogenetic origin (11,12). In our case, the presence of both a benign Brenner tumour and a mucinous cystadenoma in the same ovary fits this well-described but uncommon phenomenon. Careful histopathological examination is crucial, as the mucinous element may dominate and mask the smaller Brenner component if extensive sampling is not undertaken (2,11).

Molecular studies have provided additional insights into this dual pathology. Tafe et al. demonstrated that Brenner and mucinous elements within the same tumour often share concordant RAS mutations and MYC amplification, supporting a monoclonal origin (12). Other genomic and immunohistochemical studies also support the hypothesis of divergent differentiation from a common precursor lesion, rather than independent tumours (14,15).

Clinically, Brenner tumours are usually asymptomatic, though they may present with abdominal pain, distension, or a palpable pelvic mass when large (6,7). Our patient presented with abdominal pain, altered bowel habits, and weight loss, which are nonspecific and may mimic gastrointestinal pathology. Imaging features are also not specific: ultrasound and CT often show mixed cystic-solid adnexal masses, sometimes with calcifications in Brenner tumours, while mucinous cystadenomas typically appear as multilocular cysts (6,7,16). Thus, radiology rarely provides a definitive diagnosis in combined lesions.

The recommended treatment for Brenner tumours depends on patient age, menopausal status, and histological features. In postmenopausal women, total abdominal hysterectomy with bilateral salpingo-oophorectomy remains the standard approach, as was done in this case (1,5). In younger patients, fertility-preserving surgery may be considered if the lesion is benign and confined (14). Prognosis is excellent in benign cases, with recurrence being extremely rare following complete excision (10,13,17). Malignant Brenner tumours, however, carry a poor prognosis due to late detection and limited response to chemotherapy (3,7,18).

An additional surgical consideration is appendectomy in the presence of mucinous ovarian tumours. While some authors have historically advocated routine appendectomy, more recent systematic reviews and meta-analyses have shown very low incidence of occult appendiceal pathology in cases with a grossly normal appendix (16). This supports a selective approach, reserving appendectomy for cases where the appendix appears abnormal intraoperatively. In our patient, the appendix was grossly normal and thus preserved, in line with current recommendations.

CONCLUSION

The coexistence of benign Brenner tumour with mucinous cystadenoma is an uncommon ovarian pathology that poses diagnostic and therapeutic challenges. Recognition of this entity is important, as radiological and intraoperative findings may mimic malignant disease, and only detailed histopathological evaluation can establish the correct diagnosis. Awareness among gynecologists and pathologists regarding such combined tumours will aid in appropriate surgical management and prevent unnecessary overtreatment, while ensuring favourable patient outcomes.

REFERENCES

1. Lee KR, Tavassoli FA, Prat J. In: Surface epithelial-stromal tumours. Pathology and Genetics Tumours of the Breast and Female Genital Organs. Tavassoli FA, Devilee P, editors. Lyon: IARC Press; 2003. pp. 140–3.
2. Longacre TA, Gilks CB. In: Surface epithelial-stromal tumors of the ovary. Gynecologic Pathology. Nucci MR, Oliva E, Goldbum JR, editors. London: Churchill Livingstone Elsevier; 2009. pp. 393–444.
3. Indraccolo U, Cingolani N, Indraccolo SR. Bilateral Brenner tumor with endometrial adenocarcinoma in a postmenopausal woman. Eur J Gynaecol Oncol. 2007;28:233–4.
4. Sen U, Sankaranarayanan R, Mandal S, Ramanakumar AV, Parkin DM, Siddiqi M. Cancer patterns in Eastern India: The first report of the Kolkata cancer registry. Int J Cancer. 2002;100:86–91. doi:10.1002/ijc.10446.
5. Kauff ND, Satagopan JM, Robson ME, Scheuer L, Hensley M, Hudis CA, et al. Risk-reducing salpingo-oophorectomy in women with a BRCA1 or BRCA2 mutation. N Engl J Med. 2002;346:1609–15. doi:10.1056/NEJMoa020119.
6. Athey PA, Siegel MF. Sonographic features of Brenner tumor of the ovary. J Ultrasound Med. 1987;6:367–72. doi:10.7863/jum.1987.6.7.367.
7. Takahama J, Ascher SM, Hirohashi S, Takewa M, Ito T, Iwasaki S, et al. Borderline Brenner tumor of the ovary: MRI findings. Abdom Imaging. 2004;29:528–30. doi:10.1007/s00261-003-0145-4.
8. Seidman JD, Russell P, Kurman RJ. In: Surface epithelial tumors of the ovary. Blaustein's Pathology of the Female Genital Tract. 5th ed. Kurman RJ, editor. New York: Springer Verlag; 2002. p. 879.
9. Sternberg WH. In: Non-functioning ovarian neoplasm's. The Ovary. Grady HG, Smith DE, editors. Baltimore: Williams and Wilkins; 1963. pp. 209–15.
10. Girling JC, Soutter WP, Stanton SL. Gynaecology. 2nd ed. London: Churchill Livingstone; 1997. pp. 615–27.
11. Pradhan P, Mohanty L, Pradhan D, Pujari S, Kar A. Benign Brenner tumor of ovary with mucinous cystadenoma: A case report. Asia J Pharm Health Sci. 2017;7:1643–6.
12. Tafe LJ, Muller KE, Ananda G, et al. Molecular genetic analysis of ovarian Brenner tumors and associated mucinous epithelial neoplasms: high variant concordance and identification of mutually exclusive RAS driver mutations and MYC amplification. Am J Pathol. 2016;186:671–7.
13. Borah T, Mahanta RK, Bora BD, Saikia S. Brenner tumor of ovary: An incidental finding. J Midlife Health. 2011;2:40–1.
14. Kato H, Kanematsu M, Furui T, Morishige K, Hirose Y. Ovarian mucinous cystadenoma coexisting with benign Brenner tumor: MR imaging findings. Abdom Imaging. 2013;38:412–416. doi:10.1007/s00261-012-9954-0.
15. Abbas AM, Amin MT. Brenner's tumor associated with ovarian mucinous cystadenoma reaching a huge size in a postmenopausal woman. J Cancer Res Ther. 2015;11(4):1030. doi:10.4103/0973-1482.147721.
16. Cosyns S, Laenen A, Van Gorp T, Neven P, Vergote I, Amant F, et al. Necessity of appendectomy for mucinous borderline ovarian tumors: a systematic review. Arch Gynecol Obstet. 2016;294(5):911–916. doi:10.1007/s00404-016-4165-7.
17. Alloush F, Bahmad HF, Lutz B, Poppiti R, Recine M, Alghamdi S, Goldenberg LE. Brenner Tumor of the Ovary: A 10-Year Single Institution Experience and Comprehensive Review of the Literature. Med Sci (Basel). 2023 Feb 7;11(1):18.
18. Seidman JD, Kurman RJ, Ronnett BM, Shih IeM, Ellenson LH, Hedrick L, et al. Primary and metastatic mucinous adenocarcinomas in the ovaries: incidence in routine practice with re-evaluation of the value of mucinous borderline tumors. Int J Gynecol Pathol. 2003;22(2):133–139. doi:10.1097/00004347-200304000-00004.