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Case Report

Pathology Section

Ovarian Brenner Tumour: A Case Report

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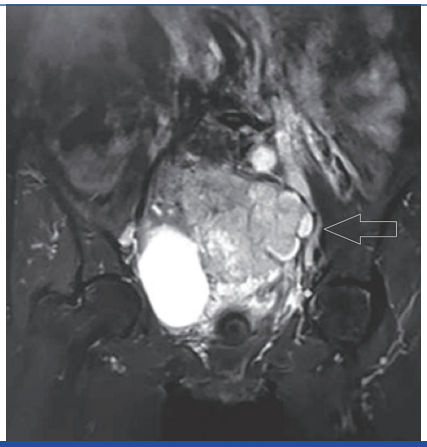
ABSTRACT

Brenner's tumour is a rare epithelial ovarian cancer, accounting for less than 5% of all cases. It is characterised by the presence of cells with transitional features between epithelial and mesenchymal cells. The diagnosis of Brenner's tumour of the ovary has become more frequent in recent years. Accurate diagnosis is crucial since it exhibits distinct clinical behaviour and prognosis compared to other types of ovarian cancer. Studies have confirmed that this type of ovarian cancer shares unique characteristics similar to urothelial tissue and can be differentiated from non cancerous abnormal growths known as metaplastic and/or malignant Brenner's tumours. Hereby, the authors present a case report of a 54-year-old woman, who presented with lumbar pain, abdominal discomfort, weight loss, abnormal uterine bleeding, and a persistent abdominal mass for a month. Abdominal and pelvic magnetic resonance imaging revealed an abnormal extensive, lobulated, and ill-defined lesion with solid and cystic components. The patient's alpha-fetoprotein tumour marker was within the normal range (5.20 IU/mL), while beta-human chorionic gonadotropin (8.67 mIU/mL) and carcinoembryonic antigen (5.3 ng/mL) levels were slightly elevated. Serum Cancer Antigen (CA)-19-9 levels were within the normal range (9.0 U/mL). Following the surgical procedure, microscopic examination of the tissue confirmed the primary type of cancer in the ovary as Brenner's tumour. Due to its rarity, favourable response to chemotherapy, and lower incidence compared to other tumour types, patients with Brenner's tumours typically have a better prognosis.

Keywords: Abdomen distension, Carcinoembryonic antigen, Cystic, Grossing, Ovary

CASE REPORT

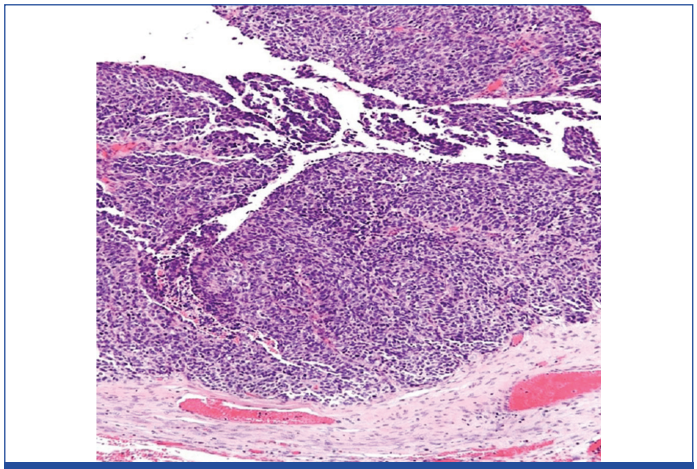
A 54-year-old female presented with lumbago, abdominal distension, an abdominal growth, weight loss, and abnormal uterine bleeding for one month. An Magnetic Resonance Imaging (MRI) scan of the abdomen and pelvis revealed a significant irregularly shaped, indistinctly defined, and heterogeneous lesion. The lesion contained both solid and cystic components, measuring 14×13×12 cm, with no distinct ovaries visible. Pressing the bladder and displacing the rectum showed that the mass extended up to the anterior abdominal wall while leaving the bladder unaffected. Based on radiological observations, a differential diagnosis of malignant ovarian tumour was made. Contrast MRI of the abdomen and pelvis showed a cystic and solid lesion in the right ovary, suggesting a solid and cystic ovarian mass [Table/Fig-1].



[Table/Fig-1]: Contrast MRI of the abdomen and pelvis showing a heterogeneous lesion with solid and cystic components in the coronal section of the ovary.

The patient underwent evaluation by a multidisciplinary team including radiology, pathology, and surgical oncology experts. Prior to surgery, specific laboratory investigations were conducted. Preliminary assessment of tumour markers revealed that serum CA19-9 was within the normal range (9.0 U/mL), and alpha-fetoprotein levels were acceptable (5.20 IU/mL). However, beta-human chorionic gonadotropin levels (8.67 mIU/mL) and carcinoembryonic antigen levels (5.3 ng/mL) were slightly elevated. Surgery was planned based on the preliminary diagnosis of a malignant ovarian tumour, and the specimen was sent for histopathological examination {Haematoxylin and Eosin (H&E)}.

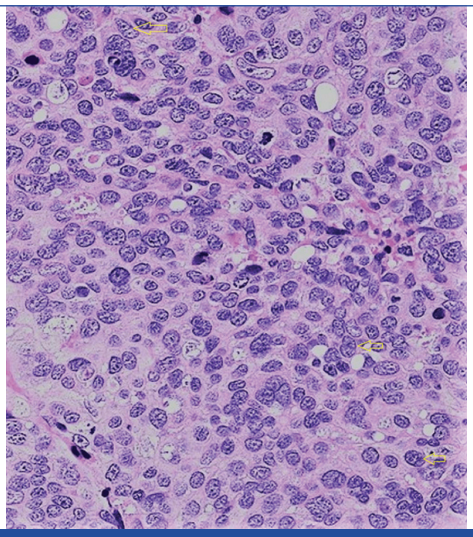
Gross examination of the specimen showed that the right ovarian tumour measured 12×9×6 cm, with papillary excrescences on its external surface and a visible capsular breach. Although some cystic and necrotic areas were present, the cut surface was predominantly solid (approximately 60% solid and 40% cystic and necrotic). The left ovary was also enlarged, measuring 7.5×5.5×3 cm. Microscopic examination of the right ovarian mass revealed an infiltrating malignant tumour with prominent intracystic projections and smooth luminal borders. The tumour consisted of pleomorphic transitional-type epithelium lining with thick angular papillae, as shown in [Table/Fig-2].



[Table/Fig-2]: Photomicrograph showing transitional lining epithelium at 40x, H&E.

The arrangement of cells in the tumour was noted to form clusters and layers. The tumour cells exhibited round or polygonal shapes and had a cytoplasm that ranged from clear to granular in appearance.

These cells were characterised by large vesicular or grooved nuclei with a high nucleus-to-cytoplasm ratio [Table/Fig-3]. The chromatin appeared coarse, and the nucleoli were visible. The solid layers of the tumour contained small spaces lined with numerous layers of transitional cells exhibiting malignant traits such as pleomorphism and hyperchromatic nuclei.



[Table/Fig-3]: Photomicrograph showing groove nuclei highlighted by yellow arrows at, 40x, H&E.

DISCUSSION

Ovarian Brenner's tumour is a rare form of surface epithelial cancer that can be benign or malignant. It is classified as a primary high-grade carcinoma with urothelial characteristics, and its variants (benign, borderline, or malignant) are recognised based on growth patterns and cytological features. Brenner's tumour accounts for only 1% of surface epithelial tumours, while mixed carcinomas with a minor urothelial component account for 3% and those with a predominant urothelial component account for 5% [1]. Immune profiling studies have been conducted to analyse the immunophenotypes of Brenner tumours and urothelial carcinomas, but the results have been variable and sometimes conflicting [2,3]. The most recent version of the World Health Organisation (WHO) Classification of Tumours of Female Reproductive Organs, published in 2020, provides a standardised approach to diagnosing and managing tumours of the female reproductive system [4].

Brenner's tumour can be differentiated from other types of ovarian cancer by its unique architectural and cytologic features and growth patterns. Recognising these features can lead to a more accurate diagnosis of Brenner's tumour and help determine its distinct clinical behaviour [5]. The immune profile of ovarian surface epithelial and urothelial carcinomas is similar. Brenner's tumours do not express urothelial markers CK13, CK20, and uroplakin III, but primary urothelial tumours express CK7 [6]. In present report, Immunohistochemistry (IHC) was positive for p63 and GATA 3, confirming the diagnosis of Brenner's tumour.

Ovarian Brenner's tumours are typically diagnosed at an early stage, resulting in a generally positive prognosis after surgery, with an 80% diagnosis rate at Stage I. However, for advanced-stage Brenner's tumours, the prognosis is poor. Patients with strictly confined ovarian Brenner's tumours have a much higher 5-year survival rate (94.5%) compared to those with extraovarian disease (51.3%). Adjuvant chemotherapy has improved survival rates in women with epithelial ovarian cancer [7]. In a limited retrospective study, the use of platinum-based chemotherapeutic agents plus paclitaxel postoperatively improved survival [8].

The novelty of the present case is that it represents both solid and cystic components in the ovary, with the tumour extending to the anterior abdominal wall while leaving the bladder unaffected. Previously, Brenner's tumours were referred to as transitional cell carcinoma due to their urothelial component and morphological similarity to transitional cell carcinomas of the urinary bladder. However, with the help of newer diagnostic modalities like immunohistochemistry, the morphological dilemma has been resolved. The term transitional cell carcinoma is now obsolete, and the WHO has introduced "Brenner's tumour" in its place in the new classification.

CONCLUSION(S)

Brenner's tumour of the ovary is a rare and recently recognised subtype of ovarian epithelial neoplasms. Morphologically, they resemble carcinomas of the urinary bladder, but their immunological profile is distinct. Histopathology remains the main method for diagnosis and differentiation from histologically similar tumours, as observed in this case where confirmation was made through immunohistochemistry. Surgical excision is the primary treatment modality. Identifying Brenner's tumour of the ovary is crucial for optimal management, considering the enhanced chemosensitivity and improved 5-year survival rates associated with its recognition.

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