

## Malignant Brenner Tumour of the Ovary: A Rare Entity

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### Abstract

Malignant Brenner tumors (MBTs) of the ovary are very rare, and their definition, biology and treatment modality have not been established. Most Brenner tumors are benign, with only 1% being malignant. In this study we present a case of 30 years old women with a rare malignant Brenner tumour. She presented at a peripheral referral hospital with a complaint of abdominal pain and mass. Ultrasonography revealed left sided ovarian tumours. She is referred for evaluation of a complex pelvic mass and elevated serum CA-125 level. She underwent left salpingo-oophorectomy and the specimen was sent for histopathological study. Histopathology revealed malignant Brenner tumour. Immunohistochemistry tumour cells are positive for pancytokeratin and negative for CK7/CK8/WT1/Pax8/CA125/calretinin/inhibin.

**Keywords:** Brenner tumour, immunohistochemistry, malignant Brenner.

### 1. Background

Worldwide, ovarian carcinoma continues to be responsible for more deaths than all other gynecologic malignancies. Brenner tumors are rare tumors comprising 1-2% of ovarian neoplasm. The most common age at presentation is fifty years with 70% of patients being over 40 years [1]. It represents around 3% of all ovarian tumors, occurring more commonly after the menopause. These tumors are usually benign, with malignant change found only in around 3-5% of patients [2].

Brenner tumors are usually solid, unless they are associated with other cystic ovarian tumors[3]. Brenner tumors correspond to ovarian tumors transitional cell composed of mature cells similar to urothelial cells forming nests within a fibroid stroma. The World Health Organization (WHO) classifies Brenner tumors into three categories: benign, borderline and malignant [4].

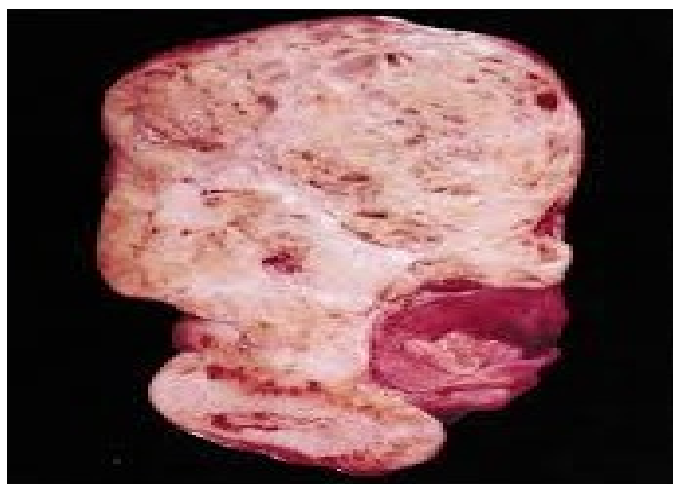
The malignant components of the tumor, which show heterogeneous epithelial growth and atypia with intervening stroma, consist of transitional cells, squamous or undifferentiated carcinoma, or an admixture of these types [4]. The malignant Brenner tumours pose a real problem making therapeutic management of their extreme rarity and prognosis deemed to be bad. A case of unilateral malignant Brenner tumor in a reproductive age group woman is reported here and its features are briefly discussed.

### 2. Case Presentation

A 30 year old woman presented at a peripheral referral hospital with a complaint of abdominal mass. At the time of examination, her vitals were stable and no abnormality was detected in general and systemic examination except for moderate anemia. On per abdominal examination, a firm to hard, non tender and the mobile lump was palpable in the pelvic region. Per vaginal examination revealed normal size uterus with a 12 cm × 10 cm mobile lump anterior to it. Ultrasonography revealed left sided ovarian tumours. She underwent left salpingo-oophorectomy and the specimen was sent for histopathological study.

### 3. Gross findings

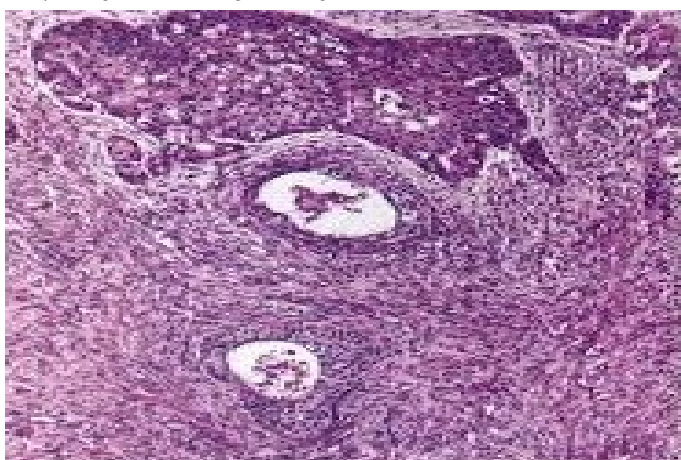
The received cystic globular mass of 11×7×7 cm (Figure 1) externally smooth on C/S unilocular cyst containing mucoid material, thick cyst wall showing solid tumour mass with friable growth mass measuring 4×3×1 cm. C/S of mass solid while no haemorrhage, necrosis seen.



**Figure 1: Malignant Brenner Tumour**

### 3.1 Microscopy

Multiple sections studied from tumour mass in the ovarian cyst shows that proliferating epithelial cells in the background of fibrous stroma. The epithelial cells were forming large to small nests or lobules separated by fibrous stroma (Figure 2). The individual epithelial cell was round to elongate with moderate amount of cytoplasm and pleomorphic oval to round basophilic nuclei with few showing longitudinal nuclear grooves (coffee-bean appearance) with prominent nucleoli, mitotic figures were seen. Papillary formation was also seen. The tumor nest showed the formation of cystic spaces which were lined by the similar tumour cells and showed central necrosis. Stromal invasion was noted. With the basic idea of malignant Brenner tumour tissue send for immunohistochemistry, tumour cells were positive for pancytokeratin and negative for CK7/CK8/WT1/Pax 8/CA125/calretinin/inhibin.



**Figure 2: Malignant Brenner Tumour**

**A large irregular nest of malignant transitional cells with jagged margins lies above two benign Brenner nest with central cavities**

## 4. Discussion

The term Brenner tumour was introduced by Robert Meyer in 1932, referring to a tumour described by Fritz Brenner 25 years previously [5]. It is very rare. The most common site is ovary; however, it has also been described in

other organ such as testis and epididymis [6]. It has been reported that Brenner tumour can reveal itself with abnormal uterine bleeding in postmenopausal females and sometimes may be associated with endometrial polyposis, hyperplasia and adenocarcinoma. Brenner tumors are also known to be associated with other benign or malignant ipsilateral and/or contralateral tumors of the ovary [5].

Brenner tumors are classified under surface epithelial tumors of ovary. The average age at presentation is 50 years with 71% of the patients being over 40 years. Grossly these tumors vary greatly in size and are usually unilateral, firm, solid gray white with cystic spaces [7,8]. In contrast to average age of presentation in our case age of presentation is 30 years. U/L grossly unilocular cyst containing mucoid material thick cyst wall showing solid tumour mass with friable growth mass measuring 4×3×1 cm. C/S of mass solid white areas of necrosis and no hemorrhages were seen.

By definition, transitional cell carcinoma of the ovary and malignant Brenner tumours are composed of epithelial cells morphologically resembling urothelium. At matched stage, transitional cell carcinoma of the ovary has a worse prognosis compared to malignant Brenner tumour, therefore, transitional cell carcinoma of ovary should be differentiated from malignant Brenner tumours [9]. In addition to not having a benign Brenner component, transitional cell carcinoma lacked the prominent stromal calcification common in most benign and malignant Brenner tumours. Transitional cell carcinoma is sufficiently different from malignant Brenner tumour in that it is reasonable to suppose that ovarian transitional cell carcinoma arises directly from pluripotential surface epithelium of the ovary and from cells with urothelial potential, rather than from a benign or proliferative Brenner tumor precursor [10]. Thus, extensive tumor sampling is needed to make an accurate diagnosis. Brenner tumors have been reported to co-exist with transitional tumours of urinary bladder but such a possibility was ruled out in our case.

First case of malignant Brenner tumor was described in 1945 by von numbers [11]. The criteria proposed by Hull and Campbell in 1973 for diagnosis of malignant Brenner tumor are as follows [12].

- 1) Frankly malignant histological features must be present.
- 2) There must be an intimate association between the malignant element and a benign Brenner tumor.
- 3) Mucinous cystadenoma should preferably be absent or must be well separated from both benign and malignant Brenner tumor
- 4) Stromal invasion by epithelial elements of malignant Brenner tumor must be demonstrated.

The present case fulfilled all the criteria described above. Most Brenner tumours are candidates for surgical resection. Malignant Brenner tumours may affect surrounding tissue and metastasize into other structures, but this is so rare

that a standard treatment has not been developed. Even malignant Brenner tumours, if diagnosed early, are candidates for complete surgical resection [13]. Immunohistochemistry done for confirmation revealed that tumour cells are positive for pancytokeratin and negative for CK7/CK8/WT1/Pax8/CA125/calretinin/inhibin.

## 5. Conclusion

Since MBTs are rare, reports about them are restricted to case reports. Most of the studies reported a case of MBT in postmenopausal female at the age of 40 to 50 yrs. In our study, we presenting a case of unilateral malignant Brenner tumor in a reproductive age group woman (30 years) are reported. Because of the limited clinical research reports, MBTs require further intervention trials and further studies.

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