

CASE REPORT

Invasive lobular carcinoma of the breast diagnosed from an ovarian tumour

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Abstract

Invasive lobular carcinoma of breast is well known to be able to metastasise to unusual places, including the gastrointestinal and gynaecological tracts. However, it is very unusual for breast cancer to present in an ovarian Brenner tumour. This case highlights the diagnostic difficulties of patients presenting with unilateral ovarian masses, and the merits of thorough histological assessment of the entire pathological specimen despite the presence of one obvious pathological diagnosis.

Keywords: Breast cancer, Brenner tumour of ovary, invasive lobular carcinoma

INTRODUCTION

Ovarian metastases are rarely the initial clinical manifestation of breast carcinoma. They are usually manifestations of advanced disease, presenting at an average of 5 years after the initial diagnosis, and found in up to 24 to 40% of cases in autopsy series.^{1,2} We report here an unusual presentation of breast cancer, which was diagnosed pathologically in a Brenner tumour.

CASE REPORT

A 62-year-old woman presented to Accident and Emergency with nausea, vomiting and abdominal pain. Examination identified a large abdominal mass arising from the left pelvis. Ultrasound demonstrated that the mass was complex but mainly solid and measured 16-20 cm in diameter. There was no significant ascites. A small right pleural effusion was present but cytological examination of the pleural fluid aspiration found only reactive cells.

An ultrasound guided biopsy of the pelvic mass obtained necrotic tissue only. No malignancy was identified. The patient's haemoglobin dropped from 10.6 g/dl on admission to 6.6 g/dl in the week following the biopsy. A laparotomy was performed and a haemorrhagic, necrotic left ovarian mass was found. This was adherent to the bowel, with two twists in the pedicle. The

right ovary was small and atrophic. Adhesions between the bowel, peritoneum and the ovary were divided and a total abdominal hysterectomy with bilateral salpingo-oophorectomy and infracolic omentectomy was performed.

Pathology

The left ovarian tumour was 21 cm in diameter with a solid cut surface and showed extensive haemorrhagic necrosis. Histologically the small amount of viable tumour present consisted of large amounts of fibrous stroma containing nests of bland transitional cells characteristic of a benign Brenner tumour of the ovary (Fig 1). However, there were also occasional small foci of infiltrative appearing tumour with dispersed atypical cells and mitotic figures which were mainly around arteries. These features suggested a carcinoma, although the possibility of luteinisation of stromal cells, as may occur in Brenner tumours, was also considered (Fig 2). The appearances were dissimilar to the metaplastic benign mucinous tumours which sometimes accompany Brenner tumours and not typical of a primary carcinoma of the ovary. No tumour was present in the right ovary, the omentum or remainder of the specimen.

Immunophenotyping (positive for CK7, ER and PR and E-cadherin, negative for vimentin, S100, CK20, CEA, CD10, WT1 and CK14)

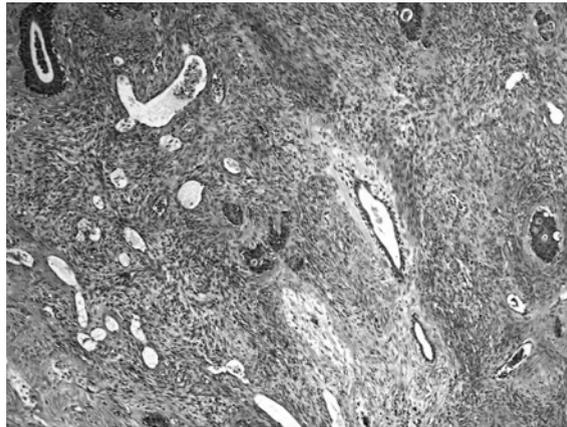


FIG. 1: Brenner tumour composed of well circumscribed islands of bland transitional epithelium within plentiful cellular and fibrous stroma

confirmed that this was a carcinoma and supported that it was metastatic with the breast thought to be the most likely primary site (Fig 3). Histologically the pattern of tumour infiltration was consistent with a lobular carcinoma of the breast. Immunohistochemistry for HER2 was negative. It was initially thought that the extensive haemorrhagic necrosis was due to torsion of the Brenner tumour but much of the necrotic area had similar immunostaining characteristics to the carcinoma.

No mass was palpable in the breasts but a mammogram demonstrated a 6 x 4 mm lesion in the right breast and a biopsy of this confirmed lobular carcinoma of breast. No other metastases were identified with staging CXR, liver ultrasound and bone scan. The patient was treated with an aromatase inhibitor, and was clinically well on review fifteen months later.

DISCUSSION

This is an unusual presentation of breast cancer, inside a Brenner tumour of the ovary. Extragonadal tumours spread to the ovary by direct extension, surface implantation, lymphatic or haematogeneous spread. 5-15% of malignant ovarian tumours are metastatic tumours.^{3,4} These may be misdiagnosed as primary tumours, potentially leading to inappropriate management.

The main radiological feature which differentiates a secondary from a primary ovarian neoplasm is multilocularity: only 36% of secondary ovarian neoplasms are multilocular on MRI, versus 74% of primary neoplasms.⁵ Bilaterality is less discriminatory with 35% of primary ovarian tumours being bilateral compared with an overall 50% of metastatic ones.

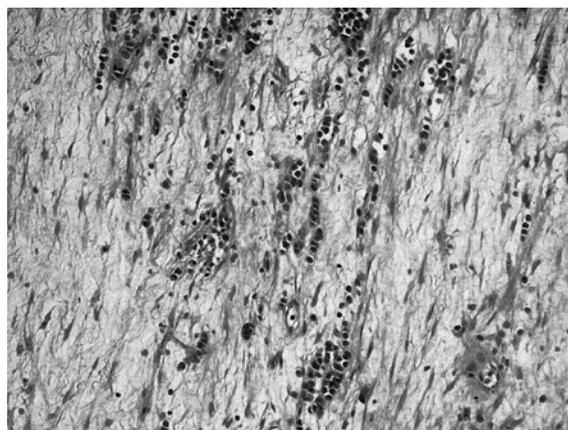


FIG. 2: Metastatic carcinoma with single file pattern similar to lobular carcinoma of the breast

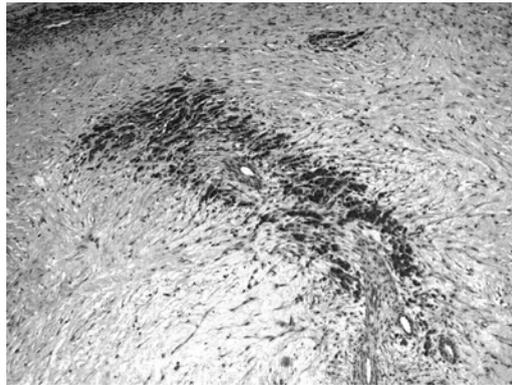


FIG. 3: Immunoperoxidase for EMA confirming epithelial nature of the cells and demonstrating perivascular survival of cells within the necrotic tumour.

In cases simulating a primary ovarian tumour, pathological features that are suggestive of metastatic diseases are: bilaterality, mild ovarian enlargement, vascular emboli, a Krukenberg morphology, no omental deposits and the absence of transition from benign to malignant epithelium.⁶ Metastatic breast carcinoma in the ovary is bilateral in 60% of cases.⁷ The involved ovary either contains multiple nodules of firm or gritty white tissue, or is completely replaced by a smooth or bosselated mass; very rarely the metastatic neoplasm is predominantly cystic.

Lobular carcinoma of breast has a particular tendency to metastasise to the ovary, where it tends to retain its characteristic 'Indian-file' pattern. In a series reported by Le Bouedec *et al*,⁸ the primary tumour type was invasive lobular carcinoma in 7 out of the 10 patients studied, despite this subtype comprising only 10% of breast cancers in general.

Death usually ensues within 12 months after detection of clinically apparent ovarian metastases.⁹ Mean survival time of over 20 months has been noted in patients in whom metastases were diagnosed only by histological examination of therapeutic oophorectomy specimens in historic series.¹⁰ With the advent of modern hormonal and chemotherapeutic regimens, however, a considerably longer median survival would be expected.

The diagnosis of metastatic carcinoma in this case was complicated by the extensive necrosis, most of the viable tumour being a benign Brenner tumour of the ovary and the necrosis initially being thought to be due entirely to torsion of a benign ovarian lesion. It remains unanswered whether the increased blood supply to the

Brenner tumour and torsion had contributed to the occurrence of metastasis to this site. It is also unclear why the ovary is a favoured site for metastases from gastrointestinal and breast primaries.

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REFERENCES

1. Turksoy N. Ovarian metastasis of breast carcinoma: A surgical surprise. *Obstet Gynecol* 1960; 15: 573-8.
2. Luisi A. Metastatic ovarian tumours. In: Junqueira AC, Gentil F (eds) *Ovarian cancer*. UICC monograph series, vol 11. 1968; Springer-Verlag, Berlin, pp87-104
3. Demopoulos RI, Touger L, Dubin N. Secondary ovarian carcinoma: a clinical and pathological evaluation. *Int J Gynecol Pathol* 1987; 6:166-75
4. Young RH, Scully RE. Metastatic tumors in the ovary: a problem-oriented approach and review of the recent literature. *Semin Diagn Pathol* 1991; 8:250-76
5. Brown DL, Zou KH, Tempny CMC, Frates MC, Silverman SG, McNeil BJ, Kurtz AB et al. Primary versus secondary ovarian malignancy: imaging findings of adnexal mass in the Radiology Diagnostic Oncology Group Study. *Radiology* 2001; 219:213-8
6. Powari M, Dey P, Gupta SK, Saha S. Metastatic tumours of the ovary: a clinico-pathological study. *Indian J Pathol Microbiol.* 2003; 46:412-5.
7. Moore RG, Chung M, Granai CO, Gajewski W, Steinhoff MM. Incidence of metastasis to the ovaries from nongenital tract primary tumors. *Gynecol Oncol.* 2004; 93:87-91.

8. Le Bouedec G, de Latour M, Levrel O, Dauplat J. Krukenberg tumors of breast origin. 10 cases. *Presse Med.* 1997; 26:454-7.
9. Johansson M. Clinical aspects of metastatic ovarian cancer of extragenital origin. *Acta Obstet Gynecol Scand* 1960; 39:681-97.
10. Osborne MP, Pitts RM. Therapeutic oophorectomy for advanced breast cancer: the significance of metastases to the ovary and of ovarian cortical stromal hyperplasias. *Cancer* 1961;14:126-30