Solitary adrenal metastasis from invasive infiltrating ductal carcinoma: A case report and review of literature

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Abstract: Solitary adrenal metastasis is a rare presentation in breast cancer and it presents the clinician with a difficult therapeutic dilemma as there are no existing guidelines for optimal management. On literature review, we only found one published case report of solitary adrenal metastasis from infiltrating ductal carcinoma of the breast. Here we present a case of a 75 year-old lady who presented with a right breast lump which was subsequently confirmed to be infiltrating ductal carcinoma. She underwent a right mastectomy and axillary clearance. Computerised tomography (CT) staging revealed a solitary adrenal metastasis. She was treated with aromatase inhibitors and her tumour markers which were initially raised has now normalised.

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Background

Although breast cancer is a common malignancy, rarely does it present with solitary adrenal metastasis. Usually, the clinical presentation is of multiple synchronous metastases at other sites such as the lung, liver, bone and brain. The clinical management is rarely controversial in the presence of synchronous metastases and systemic treatment is usually indicated if the patient is of good clinical status. However, solitary adrenal metastasis is a rare presentation in breast cancer and it presents the clinician with a difficult therapeutic dilemma as there are no existing guidelines for optimal management. On literature review, we only found one published case report of solitary adrenal metastasis from infiltrating ductal carcinoma of the breast.[1] As such, we present a case report and accompanying literature review of the management of solitary adrenal metastases.

Case History

A 75 year-old woman presented with a one-month history of bilateral breast lumps. On examination, the right breast lump was 2 cm x 3 cm, hard, fixed to the skin and non-tender, while the left breast lump was 2 cm x 2cm, firm, mobile and non tender. Axillary lymph nodes were clinically not palpable. There were no constitutional symptoms or signs suggestive of disseminated disease.

Mammography revealed a suspicious lesion at the upper outer quadrant of the right breast. Ultrasound of the right breast showed hypo-echoic lesion measuring 1.9cm x 1.6cm x 1.5cm with an irregular margin and calcification noted within the lesion. The left solid breast lesion was sonographically and radiologically benign in appearance. The findings were confirmed by fine needle aspiration which showed infiltrating carcinoma and benign cyst on the right and left breast respectively.

She underwent right mastectomy with level II axillary node clearance and left lumpectomy. Histopathology examination of the right mastectomy specimen revealed a 2.5 cm infiltrating ductal carcinoma of grade 3 which was completely excised. The tumour expressed oestrogen receptor (ER) and progesterone receptor (PR) and there was over- expression of c-Erb-2 receptors (Fig 1-3). However three axillary lymph nodes were involved with extra-capsular spread.

She underwent staging work-up with a computerised tomography (CT) of the thorax, abdomen and pelvis. This revealed a solitary right adrenal mass measuring 2.4 cm x 2.1 cm x 2.7 cm (Image 1). The imaging was reviewed at the tumour board meeting and the adrenal abnormality was felt to be a metastasis from her breast cancer due to the vascularity and enhancement characteristics. Also her tumour marker CA-153 following her mastectomy was raised making the diagnosis of metastasis likely.

Further investigations and treatment such as CT-PET, adrenalectomy and chemotherapy were deemed unsuitable, due to clinical status and preference of our patient. This lady was treated with an aromatase inhibitor. She is now more than a year from diagnosis. Her recent tumour marker level, CA -153, is now within the normal range.

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Discussion

Invasive ductal carcinoma (IDC) is the most common type of the breast cancer and constitutes approximately 70-85% of all invasive breast carcinomas.[1] IDCs typically metastasize to the lungs, liver, bones and brain. However, solitary adrenal metastasis is rare.[1]

From the review of published work, there was only one case of solitary adrenal metastasis from IDC of breast.[1] In fact, adrenal metastasis originating from breast cancer is generally associated with infiltrating lobular carcinomas (ILC) and often accompanied by synchronous multi-organ metastases.[2]

The incidence of adrenal metastases from any primary malignancy ranges from 8.6% to 27.0%.[2] The main primary cancers metastasizing into the adrenal glands were lung cancer (35.4%) followed by cancers of the stomach, oesophagus, liver, pancreas, large intestine, kidney and breast.[6] Breast malignancy was the primary site in only 2.9% of the 464 patients with histological confirmation of adrenal metastases at autopsy in a retrospective review by Lam *et al.*[3]

Adrenal metastases are often asymptomatic, patients may present with adrenal insufficiency when most of the adrenal gland is replaced or destroyed. A retrospective review found that only 4.3% presented with clinical features related to adrenal metastases prior to death.[3]

The detection of clinically silent adrenal metastases has improved with the widespread use of abdominal imaging modalities including CT, magnetic resonance imaging (MRI) and positron emission tomography (PET) CT. In cases of known malignancy, any new adrenal mass on CT, should be considered metastatic. MRI is another effective means of evaluating adrenal masses.[4] The main imaging features in differentiating between adenomas and metastatic adrenal tumours are the lipid content and enhancement characteristics. Adenomas typically are lipid rich, mildly vascular and have rapid washout times in contrast to metastatic adrenal tumours.[4]

Compared with standalone CT and MRI, PET-CT has consistently demonstrated greater sensitivity, specificity and accuracy in differentiating between benign and malignant adrenal lesions. The sensitivity of PET-CT ranged from 93% to 100%, whereas standalone CT was 61–100% and MRI was 79–100%.[4] The specificity for PET-CT ranged from 80% to 100%, standalone CT from 82–97% and MRI from 82–100%.[4]

Due to the rarity of solitary adrenal metastasis from breast cancer, the optimal treatment is still unclear. Generally for distant metastases palliative chemotherapy or hormonal treatment is recommended. However, studies in lung cancer, colorectal carcinoma, gastric cancer and renal carcinoma have demonstrated that adrenalectomy for solitary adrenal metastasis is feasible, and could lead to a longer survival in some patients.[5] As for the predictive factors of survival after adrenalectomy, so far there has been no consistent conclusion. In some studies, it appears that if the time from diagnosis of the primary tumour to the detection of adrenal metastasis is more than 6 months and if the adrenal metastasis is completely resected, then patients have favourable outcomes. The 5-year survival rate is approximate 24%~33%.[5]

Conclusion

The management of solitary adrenal metastasis in cancer patients can represent a therapeutic dilemma to oncologists. However, as described in studies, carefully selected patients may benefit from surgical excision of solitary adrenal metastasis. If this is not possible then systemic treatment may be suitable if patient is of reasonable clinical status.

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Fig1. H&E stained section composed of malignant ductal cells forming tubules and clusters. In some areas the tumour is infiltrating into the fat. The white arrows show some of the malignant tubules.

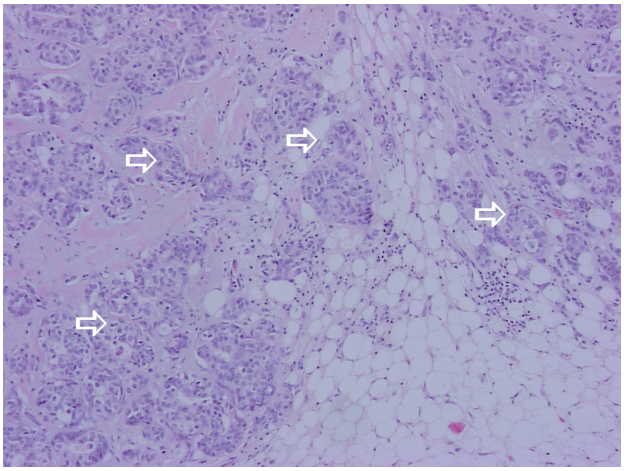

Fig2. Immunohistochemistry: Section shows all of the malignant cells express nuclear positivity for oestrogen receptor (ER).

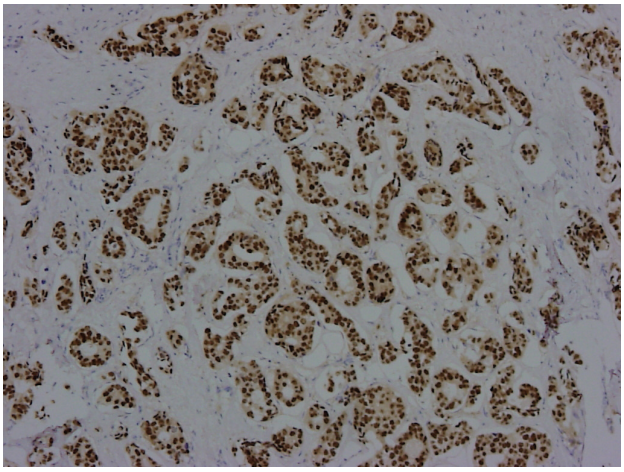

Fig 3. Immunohistochemistry: The malignant cells exhibits membranous staining (3+) for CERB-2. The white arrows show some of the tumuor cells with CERB2 expression.

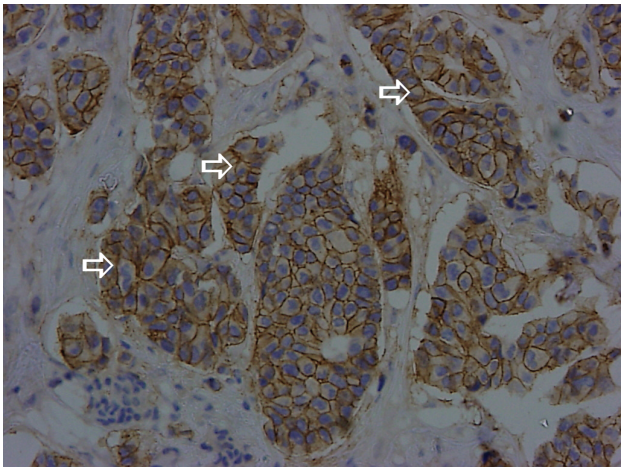

Image1: Axial CT scan image of solitary right adrenal metastasis