British Journal of Medicine & Medical Research
4(24): 4178-4185, 2014

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Breast Metastasis of Thymic Carcinoma

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Authors' contributions

All authors equally contributed to this case study.

Case Study

Received 11th March 2014
Accepted 7th May 2014
Published 29th May 2014

ABSTRACT

Aims: To enforce the concept that the breast is a possible site of metastases from other organs.
Presentation: We describe a case of a 70 year old woman diagnosed with thymic carcinoma which developed, ten months after, a single breast nodular lesion.
Case Discussion: The breast lesion was biopsied and it turned out to be a metastasis of thymic carcinoma, the patient underwent chemotherapy and currently is stable and on treatment with Paclitaxel.
Conclusion: Breast could be a site of metastases from other tumours, even from rare tumours, as in the case reported. Histological characterization of each breast lesion is mandatory for the right diagnosis and treatment.

Keywords: Thymoma; breast neoplasms; neoplasm metastases; diagnosis.

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1. INTRODUCTION

To date, in the literature few cases of breast metastases from other tumours are described [1-3]. Breast metastases from non-mammary malignant neoplasms are uncommon, and they accounts for approximately 2% of all breast tumours.

Thymic carcinoma is rare too. The incidence of distant metastases from thymic carcinoma varies from 1.5% to 15.5%, most frequently to the liver, followed by the kidney and extra thoracic lymph nodes [1-4].

2. PRESENTATION OF CASE

We present a case report of a 70-year-old woman admitted to our hospital with cough, asthenia, dyspnoea, and weight loss. Her oncological anamnesis was positive: her brother died at the age of sixty years due to lung carcinoma and her sister died at the age of fifty years due to primary breast carcinoma. Contrast enhanced computed tomography (CECT) scan was performed and it showed the presence of an expansive mass, 7cmx9cm sized, located in the anterior mediastinum. The mass showed irregular shapes and contralateral mediastinal shift was present. Superior vena cava, brachiocephalic trunk, pleural wall and the lower surface of the right ventricle wall were infiltrated (Figs. 1a-1b). CT-guided biopsy of the mediastinal mass was performed.

The histological examination showed a solid-cohesive malignant neoplasm infiltrating the surrounding tissue (Fig. 1c). The immunehistochemical analysis for Keratins (AE1/AE3) confirmed the epithelial nature of the neoplastic cells. The neoplasm was not arranged in any organoid structure reminiscent of thymic architecture. Neoplastic cells were large and nucleated and showed a clear-cut atypia and high mitotic rate. Infiltration of immature T-cells, as seen in thymoma, were not observed. Moreover, their immunohistochemical analysis showed positivity of neoplastic cells for p63, CD5 and c-kit and negativity for CD56 and TTF1. In particular, the absence of TTF1 permitted to exclude the possibility of an undifferentiated lung carcinoma and the positivity for CD5 is a typical feature of thymic carcinoma (Fig. 1d). Taking into account all these features diagnosis of thymic carcinoma was made.

Neo-adjuvant chemotherapy with Cisplatin (50mg/square meter) plus Doxorubicin (50mg/square meter) plus Cyclophosphamide (500mg/square meter) was administrated [5]. In total six cycles of chemotherapy were administrated with a 50% reduction in tumour size. Subsequently surgical removal of the residual neoplastic tissue was performed [6,7].

Three months after the surgery and ten months after the diagnosis, a nodular palpable lesion in the inferior quadrant of the left breast was found without skin's retraction.

Mammography X-ray exam showed a nodular opacity with regular shapes, 2cm in size, located in the inferior inner quadrant of the left breast (Figs. 2a-2b).

Considering her positive familiar anamnesis for breast cancer and the rarity of metastatization to the breast from thymic carcinoma, a biopsy of the lesion was mandatory. Tru-cut biopsy under ultrasound guidance was performed. Considering the patient's family history for breast cancer, the histological examination was done by a pathologist experienced in breast disease and carefully supervised by the head of our histology department. The examination showed the presence of a malignant epithelial tumour with the same features of the previous one.

Cells were characterized by severe a typia and were organized in solid fashion such as nests and cords.

The immunohistochemical analysis confirmed that neoplastic cells were positive for Keratins (AE1/AE3), CD5 and negative for oestrogen receptors, thus excluding a breast origin of the tumour. Clinical data and immune-morphological features of this specimen were conclusive for a diagnosis of breast metastatic of thymic carcinoma (Figs. 3a,3b,3c,3d).

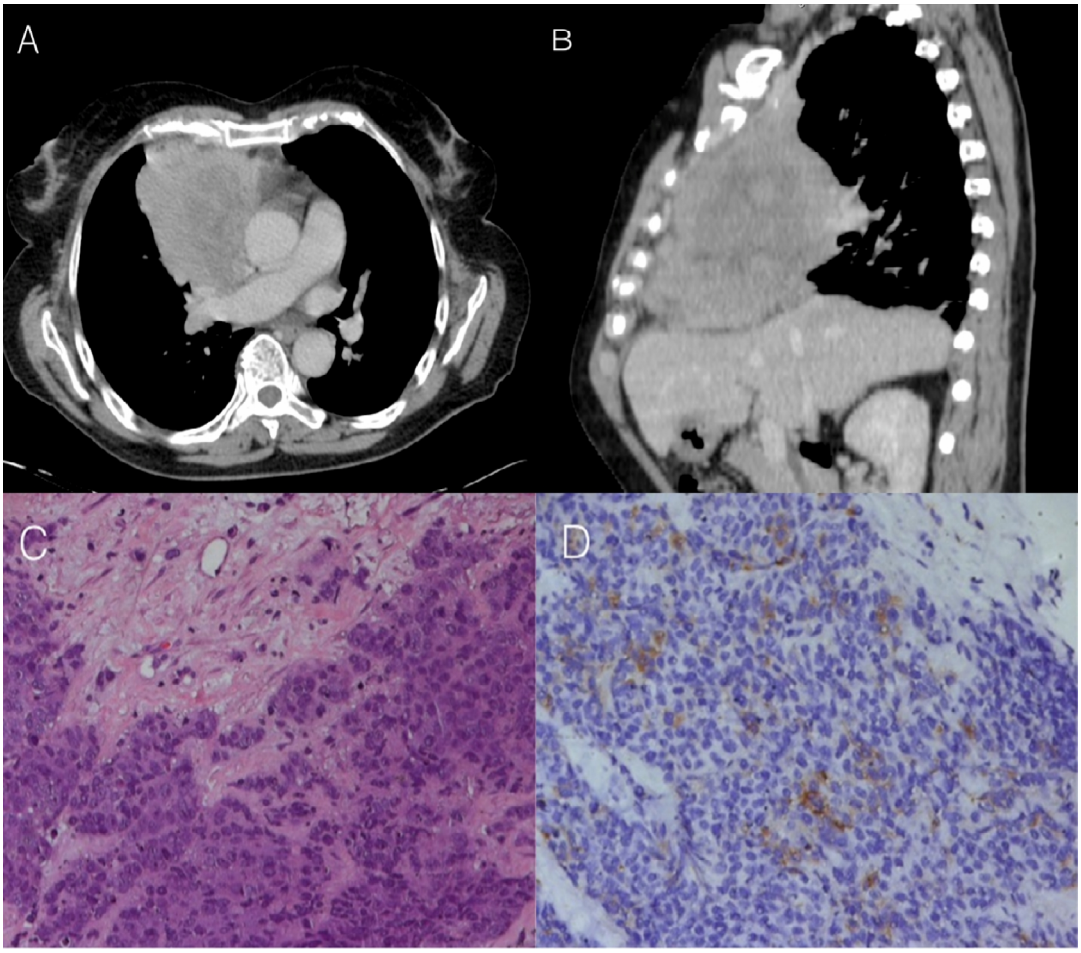

Fig. 1a. Axial contrast enhanced CT shows the presence of an expansive mass in the anterior mediastinum invading the surrounding structures.1b: contrast enhanced CT scan with multiplanar reconstruction (MPR) in sagittal plane clearly shows the mediastinal lesion and its relations with the pleural wall and vessels.1c: biopsy of the thymic mass shows a thymic carcinoma (microphotograph, 200x enlargement). 1d: Immunohistochemical analysis for CD5 showing positivity of the neoplastic cell (microphotograph, 200Xenlargement)

A restaging flurodeoxyglucose positron emission tomography (FDG-PET)-CT was performed and no other metastases were found in the whole body.

Therefore, considering the patient's poor clinical condition, a weekly chemotherapy with Paclitaxel [Princeton, NJ: Bristol-Myers Squibb; 2003](80mg/square meter), was planned [8,9].

Three months after commencement of Paclitaxel, the patient remained stable, so we decide to continue therapy with Paclitaxel.

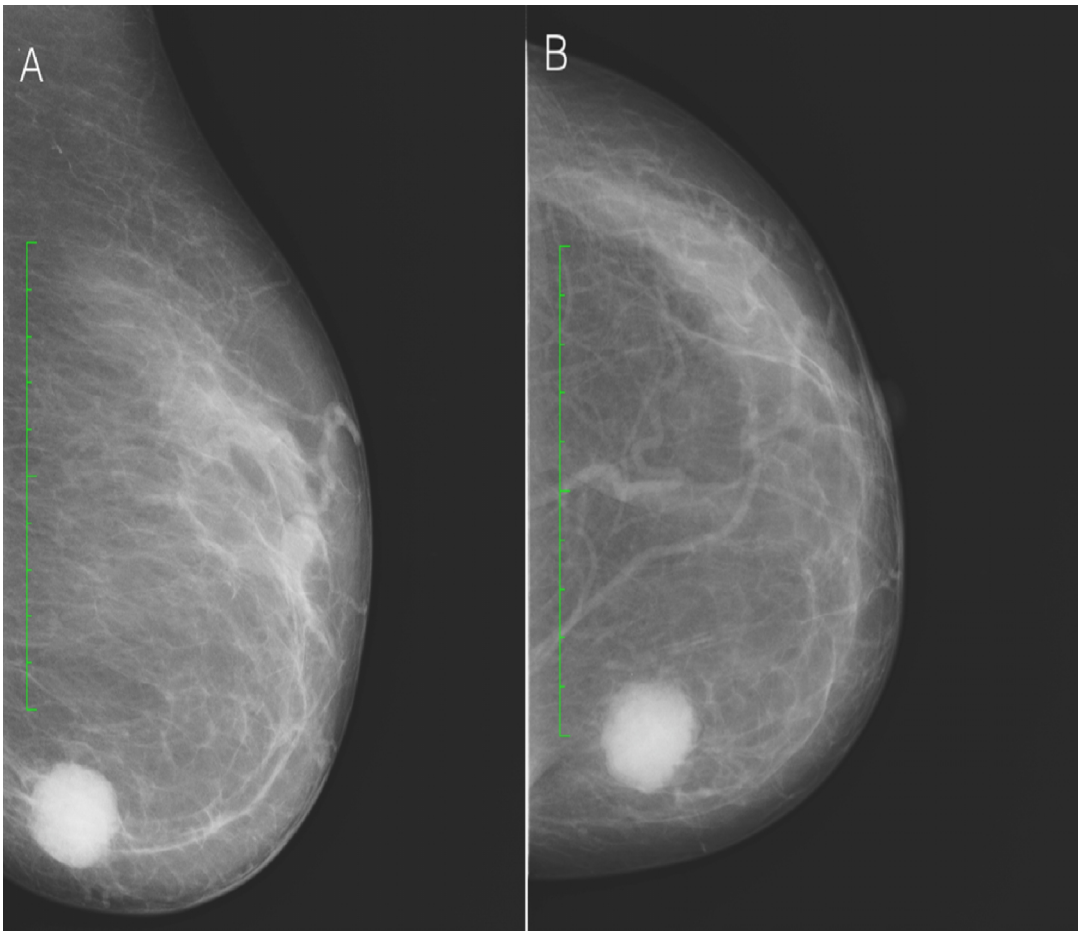

Fig. 2. Mammogram of the left breast in oblique projection (Fig. 2a) and in cranio-caudal projection (Fig. 2b) shows a fibro-fatty breast with a single nodular opacity with rounded shapes in the inferior inner quadrant of the left breast. Each small square of the measure scale represent 0,5cm

3. DISCUSSION

The most common metastatic tumour to the breast is lung carcinoma, followed by malignant lymphomas and malignant melanomas [4,10].

Thymic tumours are categorized as thymoma (types A, AB, B1, B2, B3) and thymic carcinoma by the 2004 World Health Organization (WHO) classification [11].

Thymic carcinoma is much more rare than thymoma, but much more likely to spread. Moreover the presence of a thymic carcinoma in adult patients is rare [12].

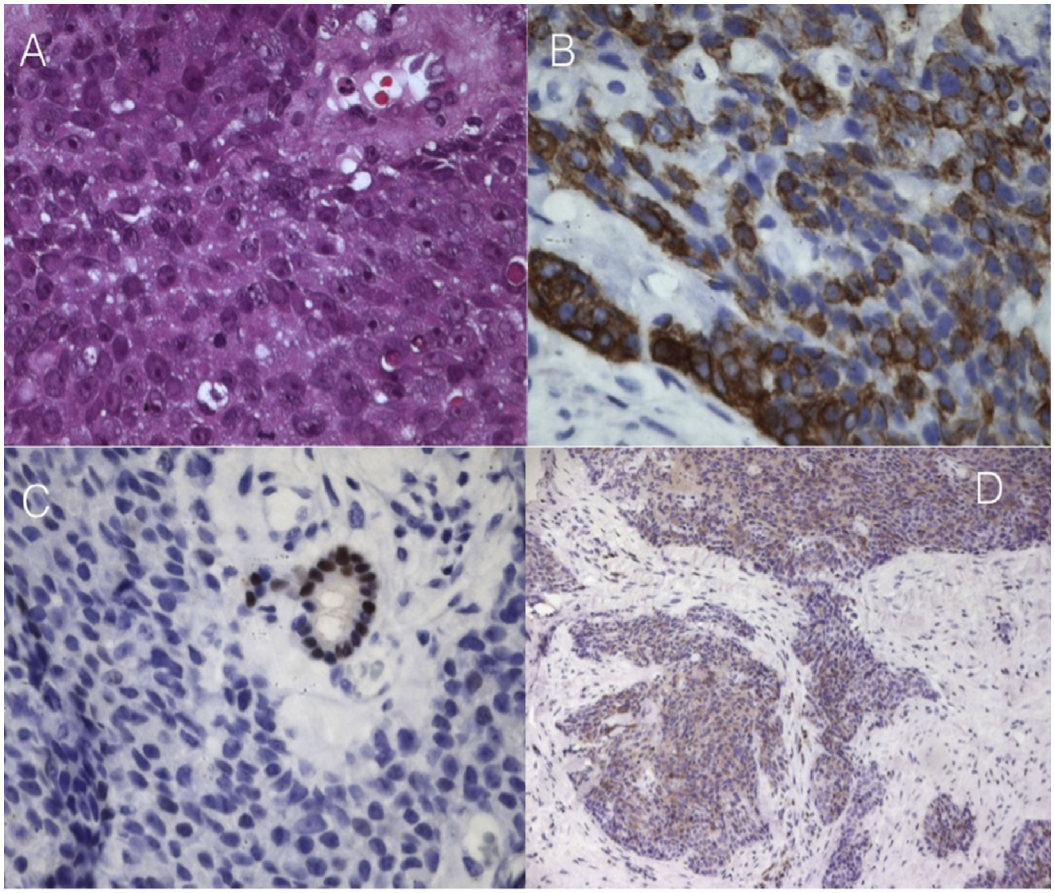

Fig. 3a. Biopsy of the breast mass showing a thymic carcinoma (microphotograph, 400 Xenlargement) 3b: immunohistochemical analysis for Keratins (AE1/AE3) showing positivity of the neoplastic cell (microphotograph, 400Xenlargement). 3c: immunohistochemical analysis for Estrogen Receptor showing negativity of the neoplastic cells and positivity of the residual normal breast tissue (microphotograph, 400Xenlargement). 3d: immimmunohistochemical analysis for CD5 showing positivity of the neoplastic cell (microphotograph, 100Xenlargement)

In a review performed by Vladislav et al. [13] the most common sites of extra-thoracic metastases of thymic origin were: lymph nodes, followed by liver and soft tissue (skeletal, muscle, retroperitoneal fat) and none case of breast metastases were described.

It could be interesting to know that, as said before, few cases of metastases of thymic carcinoma and some cases of thymic metastases of breast carcinoma are present [1-3,14-16].

Cancers metastatic to the breast usually appear as superficial, sharply defined multinodular masses with predilection to the upper outer quadrants, while in our case the metastasis was a single mass and located in the lower inner quadrant [1,4,15,16].

In general the symptoms are similar to those of primary mammary carcinoma, such as weight loss, pain in the area of the nodule and skin alterations, while in our case there were not skin alterations even if the lesion was quite big [1,16,17].

The gross size of the mammary metastatic lesion could vary from 0.5 cm to 9 cm in diameter with an average of 4 cm. Usually metastatic lesions to the breast are superficially located in the subcutaneous tissue and not fixed to the skin, while only 25% of cases show adherence to the skin. The nipple retraction or discharge generally is not present, being more common in primary breast tumour [1,17].

Distinguishing a breast metastasis from a primary mammary adenocarcinoma based on mammographic or ultrasonographic findings may be extremely difficult. Even if the absence of radiological evidence of calcification can be used as a suggestive feature for metastatic lesion, the differential diagnosis can be made only with the histological examination and immunohistochemistry [1,16,17]. Also the clinical symptoms and presentation, as in the case reported, could not be diriment for the differential diagnosis from a primary breast cancer.

In the case reported the positive anamnesis of the patient for breast cancer and the above-described features of the breast nodule made us consider the breast lesion as a primitive breast cancer, taking into account also that a breast metastasis of thymic carcinoma is very rare. This is why a histological characterization was needed in order to plan the right treatment.

Earlier recognition of metastatic tumours to the breast and the differential diagnosis from a primary breast cancer, should lead to initiation of appropriate therapy, especially in cases such as the one presented, where the breast lesion is the only location of disease after surgery.

In this case, in fact, the diagnosis of metastasis to the breast was crucial to determine the beginning of a first-line chemotherapy, being the patient otherwise considered disease free.

We have also to remember that mastectomy has little to offer in the treatment of cancers metastatic to the breast unless the tumour is extremely large in size or deeply infiltrates the breast, which necessitates major surgery in order to accomplish palliative excision.

Finally, in presence of metastases to the breast the prognosis is poor, even if not conclusive data are present at the moment. This is probably due to the fact that metastases in the breast are an expression of advanced and aggressive disease [1,16,17].

4. CONCLUSION

Cancers metastatic to the breast are rare, and breast metastasis of thymic tumours could be considered as an exception. This case report emphasizes the importance of distinguishing between primary breast cancer and metastases from other tumours with a correct histopathological diagnosis, especially in patients who already had diagnosis of malignancy else where. This is important in order to set a proper treatment and to avoid unnecessary surgeries, depending on the type of the neoplasm.

CONSENT

Patient gave her consent to write the case.

ETHICAL APPROVAL

No ethical approval was needed.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
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