Case Report

Granular Cell Tumor of the Breast – A Tricky Masquerader: An Interesting Case Report with Review of the Literature

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Abstract

Granular cell tumor is very rarely seen in the breast. It is common in 30–50 years of age but can occur at any age. It simulates malignancy on clinical and radiological examination. On morphological grounds, it can simulate a wide spectrum of lesions ranging from inflammatory to malignant. We present a case of 46-year-old female with analysis of various difficulties posed at clinical and diagnostic levels. The differential diagnoses are discussed so as to avoid any dilemma during reporting of such cases.

Keywords: *Benign, differential diagnosis, granular cell tumor, Breast, tricky masquerade*

Introduction

Granular cell tumor (GCT) is classically described in the tongue. It has been reported from many other sites such as skin, vulva, GIT, larynx, bronchus, and breast.[1] The breast lesions are extremely rare and found in premenopausal age.[2] Clinically, they simulate carcinoma due to their firm to hard consistency and mammographic support of high BI-RADS score. Abrikossoff first time reported GCT in 1926 in the tongue and pharynx by the name of granular cell myoblastoma, considering muscle as a tissue of origin. Since then, various histogenesis were thought regarding its origin. With the advent of immunohistochemistry (IHC), now Schwann cells are blamed for its origin.[3,4]

Recently, we came across an interesting case of GCT.

Case Report

A 46-year-old female presented with the left breast lump for 1 year. On physical examination, it was a single, well-defined, slightly mobile, firm to hard lump in upper outer quadrant along the axillary tail of the left breast, measuring 1.5 cm × 1.0 cm. On mammography, it showed 13.2 mm × 11.4 mm irregular mass with speculated margins in the axillary tail region of the left breast with BI-RADS score of 5 highly favoring malignancy.

Fine-needle aspiration cytology (FNAC) was inconclusive due to very low cell yield. In view of clinical and radiological suspicion of malignancy, true-cut biopsy was performed. The differentials thought on histopathology were (?) inflammatory lesion/fat necrosis, (?) GCT.

Wide local excision was advised.

We received a specimen measuring 7 cm × 4 cm × 2 cm. The cut surface showed a whitish, firm tumor measuring 1.3 × 1.0 with irregular and infiltrating margins. Few surrounding lymph nodes were also included [Figure 1].

Histopathological examination revealed granular polygonal cells in sheets, nests having abundant eosinophilic cytoplasm, and uniform round nuclei with vesicular chromatin. Occasional small prominent nucleoli were seen. There was no evidence of necrosis, increased mitotic activity, or significant pleomorphism in these cells. At the periphery of the cell islands, lymphoplasmacytic infiltration was noticed [Figure 2]. Periodic acid Schiff (PAS) and diastase-PAS showed

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positivity. The surrounding lymph nodes were free of tumors.

The diagnosis of benign GCT was considered.

IHC was performed which showed strong and diffuse positivity for S-100 and negative staining for the Epithelial membrane antigen (EMA), thus confirming the diagnosis [Figure 2].

Discussion

Breast biopsies and radical mastectomies are one of the very common specimens received in any busy surgical pathology laboratory. A pathologist usually comes across a significant number of breast carcinomas as well as benign breast lesions. GCT is rarely encountered in breast specimens.

GCT is classically described in the tongue but can occur throughout the body. In breast, they account for 5%–6% of cases. They are observed in approximately 1 in every 1000 breast cancers.[3-5]

It commonly occurs in premenopausal age, in third to fifth decade,[5] but can involve a wide age range from 17 to 74 years. Most of the cases reported are benign; however, malignant counterpart is described, and it is about 1%–2% of all GCTs.[3,4,6]

The GCT is usually solitary, small, nontender, firm to hard in consistency,[1-5] but can be multicentric.[3,4,7] Clinically, it simulates malignancy, especially scirrhous carcinoma. The usual location described is upper, inner quadrant along with the distribution of the branches of supraclavicular nerve. There can be skin and nipple retraction.[3,5,7,8]

Our patient showed a lump in upper outer quadrant along the axillary tail. There are other case reports showing similar locations.[6,7,9] At this site, there is a stronger suspicion for Infiltrating duct carcinoma (IDC).

Reports of GCT from parasternal region[5] in mastectomy scars[10] are also there. IDC following GCT has also been reported.[5]

Radiologically, it is mostly confused with malignancy.[3,7,10]

FNAC can be inconclusive[8] or confusing. Firm to hard nature of the lump at times may not yield sufficient material. We also faced similar difficulty.

On needle biopsy, the lesion can be confused with histiocytic lesions such as fat necrosis or duct ectasia.[2]

On histopathological examination, classical granular cell morphology with infiltrative borders was noted. The tumor usually has infiltrative growth pattern and invades surrounding adipose tissue.[1,2]

We also got similar findings along with additional lymphoplasmacytic cell infiltrate at the periphery of tumor islands. In a needle biopsy, it caused trouble, as only a few representative cells, simulating histiocytes admixed with inflammatory cells, were seen. It can lead to false diagnosis of inflammatory pathology. However, seeing the morphology of large cells, we suspected GCT, and wide local excision was advised. Inflammatory infiltrate has also been reported in few earlier cases.[4]

The histopathological criteria for malignancy proposed by Fanburg-Smith *et al*. are necrosis, cellular and nuclear pleomorphism, spindling, vesicular nuclei with large nucleoli, increased mitosis (>2 per 10 HPF), etc. Wang *et al*. in 2004 modified the last criteria to mitosis >5 per 50 HPF.[3,5-7]

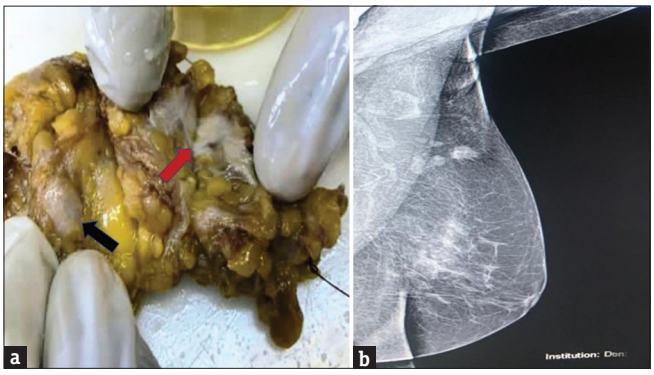

Figure 1: (a) Gross specimen of wide local excision breast showing small firm tumor with ill-defined, infiltrative borders (red arrow). Furthermore, seen is one of the lymph nodes (black arrow) in surrounding axillary fat. (b) Full-field digital mammography showing an irregular mass with spiculated margins seen in the axillary tail region of left breast measuring 13.2 mm × 11.4 mm. ACR BI-RADS 5 – Highly suggestive of malignancy

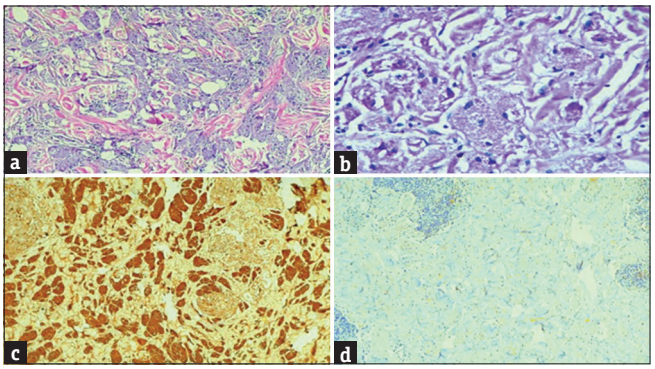

Figure 2: Photomicrograph showing (a) sheets and nests of polygonal cells with collagen strands in between. (b)The cells are showing abundant granular pink cytoplasm and vesicular nuclei with inconspicuous nucleoli, H and E ×100 and ×400. (c) Tumor cells showing diffuse and strong positive staining for S100, immunohistochemistry ×100. Infiltrative nature of cells at the border can be appreciated (d) Tumor cells are negative for the Epithelial Membrane Antigen, immunohistochemistry ×100. Lymphoplasmacytic infiltrate can be appreciated at the periphery

If three or more criteria are met, the tumor is malignant. Tumors <3 cm are usually benign.[6,9]

Initially, the cell of origin thought for GCT was skeletal muscle, smooth muscle, fibroblastic or undifferentiated mesenchymal or histiocytic cells. Now Schwann cells/neural or neuroectodermal cells are held responsible. This is supported by diffuse positivity for S-100 protein.[3,6,7]

The granules in tumor cells on histochemical stain show positivity to PAS which is resistant to diastase.[5]

On IHC, the tumor cells are diffusely positive for S-100 and CEA. They may also show positivity to CD68, calretinin, inhibin, and vimentin in some cases and are negative for CK, EMA.[5,6,8]

Although the histopathological findings are the same irrespective of the tumor location, the differential diagnosis will change. The common differentials are metastatic oncocytic renal cell carcinoma (which will be positive for CK and EMA) and alveolar soft part sarcoma (which will be myoglobin positive).[2]

Apocrine carcinoma is another differential diagnosis. However, it will have intraductal component with infiltrative component. Furthermore, primary breast carcinoma is positive for CK and EMA[4] and positivity for receptors such as estrogen receptor, progesterone receptor, or HER2/neu and negativity for vimentin which is in contrast to GCT.[2,8,10]

The treatment for benign lesions is wide local excision.[3,7,10]

Conclusion

This case is presented due to its rarity, clinical and radiological dilemma, and wide differentials on histopathology ranging from inflammatory to malignant primary and metastatic lesions. As GCT simulates a wide spectrum of these lesions, awareness regarding its unusual occurrence in the breast is necessary to avoid under or overreporting.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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