www.jmscr.igmpublication.org
Impact Factor 5.244
Index Copernicus Value: 83.27
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v5i1.16

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Granular Cell Tumor of the Male Breast – Masquerading As Carcinoma Breast-A Rare Case Report & Review of Literature

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Abstract
Granular cell tumour (GCT) is a relatively uncommon soft tissue lesion, which most often affects the tongue, skin, and subcutaneous tissue, although it may occur at anybody site. It has a disputed origin even though emerging reports and molecular studies have documented a neural crest lineage. Breast is a uncommon site for GCT more so in the male breast. Here we describe a rare case report of male breast granular cell tumor with relevant literature review.
Keywords: *Granular cell tumor, male, breast cancer.*

Case Report

We present a 46 year old male, presenting with lump left breast for 5 years duration with recent rapidity in growth, clinically the lump was hard with skin involvement and pectoralis major muscle fixity, no palpable axillary or supraclavicular nodes. A mammogram showed spiculated mass lesion with architectural destruction (BIRADS V). A core needle biopsy of the tumour revealed the diagnosis of a granular cell tumour of the breast, confirmed by positive immunohistochemical markers S100 and CD68 with low Ki67.

Wide excision of the lesion was done. Post-operative histopathology confirmed a granular cell tumour of the breast, measuring 8x7.8cmx7.3cm, with resected margins free of tumour, no features of malignancy were present. The patient is on follow up for the past one year and disease free.

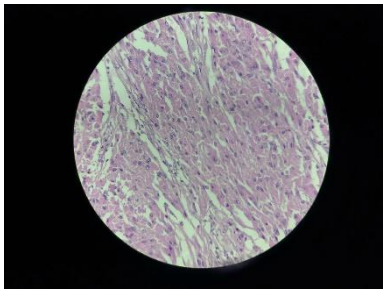

Fig 1:H&E staining shows Eosinophilic,granular cytoplasm

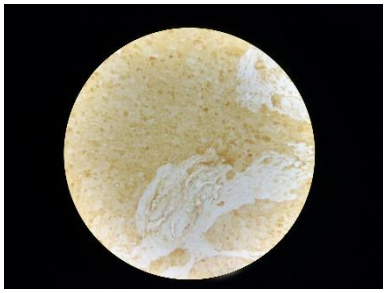

Fig 2: Immmunohistochemical stain:S-100 positive

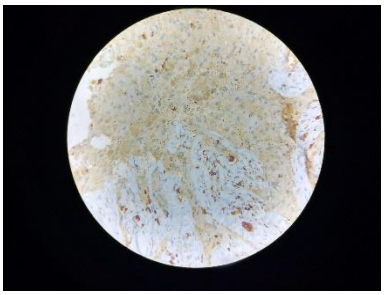

Fig 3: Immunohistochemical stain: CD 68 positive

Discussion

Granular cell tumor was first described by Abrikossoff in 1926 as granular cell myoblastoma, assuming a myogenic origin.[1] However, other investigators have since proposed histiocytic, fibroblastic, myoepithelial, and neuronal origins. The histogenesis of this lesion has been the subject of controversy. Ulrich et al showed evidence of a histiocytic derivation, and Churg and Work proposed a possible origin from smooth muscle cells, but the most widely accepted theory has been that of a Schwann cell origin, apparently because of the positivity of the tumour for the S-100 protein and the similarities exhibited in the ultrastructural features of the tumour cells and those of a Schwann cell. [2]

GCT occurs in the breast in 5 to 6% of cases and it occurs more commonly in premenopausal black women. Granular cell tumour of the breast is usually benign, although there have been reported malignant GCT cases. Desmoplasia and lack of circumscription are common features of breast GCT and it has been shown to be nondependent on estrogen and progesterone, despite the fact that most cases occur in premenopausal women and a few cases have also been described during pregnancy. [2] Granular cell tumour in association with ductal carcinoma of the breast has been reported in the contralateral and ipsilateral breast. [3] Patients with GCT of the breast are usually middle-aged, premenopausal women, although rare examples have been reported in males.[4]

A GCT in the breast may mimic breast cancer because of its poorly circumscribed contour. The mammographic features of GCTs are indeterminate in most patients, often presenting as a mass with indistinct or speculated margins. A GCT can appear as a new lesion or as a mass that enlarges over time. Calcification has not been reported [4]

The cytological features of GCTs are not pathognomonic and include differentials such as granular histiocytes or granular cell metaplasia occurring at the site of surgery or trauma. Other lesions of the breast that can mimic GCT on cytological analysis include apocrine metaplasia and apocrine carcinoma [5]

Kohashi et al described magnetic resonance features of granular cell tumors as homogeneously enhancing masses on T1- weighted imaging that show a high-signal intensity rim on T2-weighted imaging. Hoess et al reported that GCTs of the breast do not show evidence of focally enhanced tracer accumulation on Fluorodeoxy glucose positron emission tomography.[6]

In a review of breast GCT by Ventura et al., the tumor cells were strongly positive for S-100 protein and weakly positive for vimentin. Few of the cases were weakly positive for CD68. However, no immunoreaction was found for actin, cytokeratin, desmin, carcinoembryonic antigen (CEA), alpha1-antichymotrypsin, estrogen receptor, and progesterone receptor. [7]

There was a hypothesis that hormones had relationship with the pathogenesis of GCT of the breast, however no relative receptors have been found on the tumor. GCT of the breast can occur in any sites of the breast and the predominant quadrant is upper inner quadrant of the breast, which parallels the distribution of cutaneous sensory branches of the supraclavicular nerve as against breast cancer, which is most common in the outer upper quadrant.[8]

While the majority of GCTs behave in a benign manner, occasional malignant cases have been described. [9] In some cases a modest amount of nuclear polymorphism and occasional multinucl-eated cells may be found but these features should not be interpreted as evidence of malignant neoplasm. Small nerve bundles sometimes are seen in the tumor or in close association in the periphery of the lesion. Features favouring

malignancy are necrosis, high mitotic activity, nuclear atypia and high MIB-1 index.

Microscopically, tumor cells are usually described as large, polygonal cells with nests, cords or clusters-like patterns. They contain characteristic abundant granular eosinophilic cytoplasm and uniform small, round or oval nuclei. GCT does not display mitoses, nuclear multiplicity, atypia and pleomorphism. Immunohistochemically, S-100 is a sensitive marker for GCT, however it is not specific as 10% of breast malignancies display S-100 positive. CD68 is a distinctive feature for GCT and associates with abundant phagolysomes existed in cytoplasm. Moreover, vimentin, inhibin-α and are reported to be positive in some cases. Periodic acid-Schiff stain (PAS) is often positive. Cytokeratin, carcinoembryonic antigen (CEA), epithelial membrane antigen (EMA), estrogen receptor (ER), progesterone (PR) and gross cystic disease fluid protein (GCDFP-15) are generally negative.[10][8]

Granular cell tumor of the breast is best treated by wide excision. Local recurrence may occur after incomplete excision, but sometimes it is difficult to distinguish between recurrence and asynchr-onous multifocal lesions. Less than 1% of all granular cell tumors, including mammary lesions are malignant. Systemic metastases have been described in patients with non-mammary malignant granular cell tumors. Statistically significant adverse prognostic factors with regard to survival included local recurrence, metastasis, larger tumor size, older patient age, histologic classification as malignant, presence of necrosis, increased mitotic activity, spindling of tumor cells, vesicular nuclei with large nucleoli and high Ki67. [5] Systemic metastases are treated with chemotherapy though the results are generally poor.

Conclusions

GCT are rare soft tissue tumours. It is quite uncommon for GCT to occur in the breast. Here we have reported a rare case of GCT occurring in the male breast. Histological and immunohisto-chemical parameters must be considered in differentiating GCT from other common breast neoplasms including breast carcinoma. Malignant GCTs are very rare and should be carefully established after considering various pathological factors. Surgery is the main stay of treatment & wide excision generally provides excellent results.

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