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CASE REPORT

Granular Cell Tumor of Breast – A Rare Case Report

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Abstract

Granular cell tumours are low-grade tumours originating from schwann cells of peripheral nerves. This is a case of 38-year-old female who presented with a lump in breast. Radiologically, it was classified as malignant.A wide local excision was performed and the specimen was received for frozen section evaluation which reveaŀed a nodular firm mass with grey white to tan yellow, finely granular texture on cut section. Microscopic sections revealed tumor cells to be polygonal to spindle shapedwith small to medium sized nuclei and abundant eosinophilic granular cytoplasm. Tumor cells were S100 and CD68 positive. The final diagnosis was rendered as granular cell tumour.

Key Words

Frozen Section; Schwann Cells; Abrikossoff's Tumour

Introduction

Granular cell tumours (GCTs) are rare low-grade tumours originating from Schwann cells of peripheral nerves. They can develop in any site of the body, including the skin, soft tissue, and mucosal surfaces of the oral, gastrointestinal, and respiratory tracts, multifocality have also been noted in some cases[1]. Breast accounts for 5-8% of all granular cell tumours[2]. The concept of granular cell tumour(GCT) was first suggested by Weber in 1854 and was later described by Abrikossoff in 1926 by the name of granular cell myoblastoma and was considered to be derived from muscle, due to its localization in tongue and pharynx in the first reported cases [3]. Later studies using S100 immunohistochemical marker and electron microscopy, it was found that the tumour cells originate in Schwann cells of peripheral nerves [4].It is also known as Abrikossoff's tumour, granular cell myoblastoma, granular cell nerve sheath tumour, and granular cell schwannoma. They are more common in premenopausal middle-aged women, most commonly in 4th decade and more in women of African American origin[5]. These tumours clinically present as a painless lump. They are predominantly located in the upper inner quadrant, along the course of supraclavicular nerve[6].On radiology (mammography), they appear as an ill-defined spiculated lesion that mimics malignancy, hence establishing the need to recognize GCTs as a distinct entity[7]. Malignant GCTs are rare and occur in only 1% or 2% of cases of all GCTs. These commonly metastasise to liver, lung, bone, and axillary lymph nodes[8].

Case Report

In this case report we are discussing 38 years old female who presented with a painless lump in her breast. On examination the lump was approximately 3.0x 2.5 cm, firm, non-tender and was located in the lower outer quadrant of the right breast.The overlying skin and the nipple areola complex were unremarkable. No nipple discharge or discolouration were noted. Right side axillary nodes were palpable.Contralateral breast and axilla were

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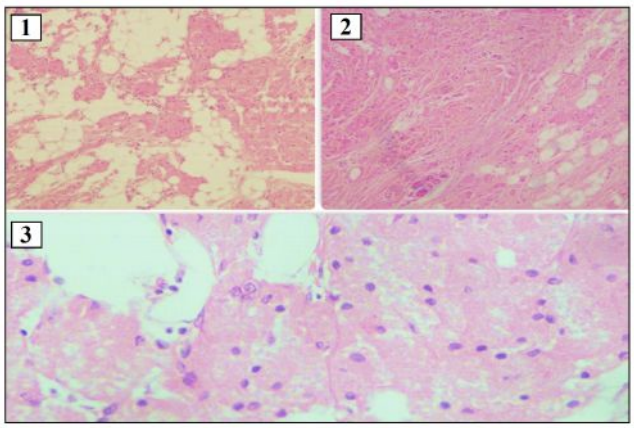

Fig1: Photomicrograph showing sheets of tumour cells seperated by fibrous septa (40x, H&E). Fig 2, 3: Photomicrograph showing sheets and nests of tumour cells seperated by fibrous septa (100x, 400x H&E).

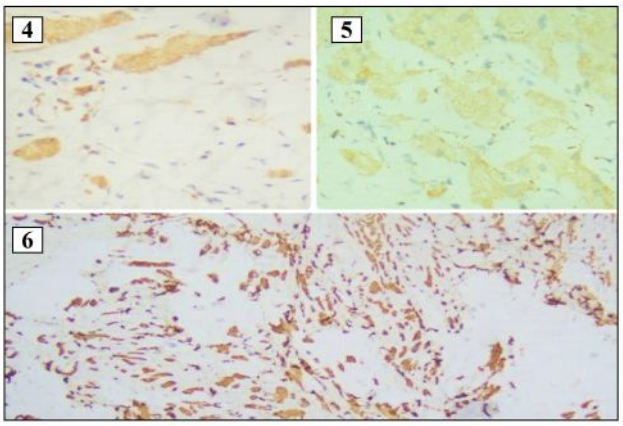

Fig 4, 5 : IHC showing CD68 positivity in tumour cells (100x); Fig 6 : IHC showing S100 positivity in tumour cells (100x).

unremarkable.

On mammography, a complex lesion with nodular opacity was noted with minimal vascularity was classified as a BIRADS V (malignant) lesion. For further diagnosis, Tru-cut biopsy was advised. Microscopically, the linear cores received predominantly were inconclusive exhibiting fibro collagenous areas with a tiny suspicious focus. Then a wide local excision was performed and the specimen was received for frozen section evaluation. The specimen was inked, serial slicing of which revealed a nodular firm mass which was grey white to tan yellow in colour and had a finely granular texture on cut section.

All the resection margins and the base were significantly far and were free from tumour grossly. The

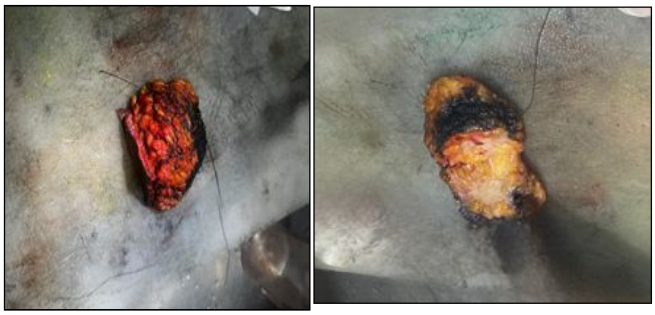

Fig. 7&8: Cut section through tumor showing gray white to tan yellow granular surface

section from the tumour was submitted for the frozen section and the report was suggestive of granular cell tumour.Later extensive sampling was done along with the resection margins and were evaluated by routine formalin fixed-paraffin embedded sections. The microscopic sections revealed a tumour arranged in sheets and separated by thin fibrous septa.

Individual tumour cells were polygonal to spindled focally exhibiting syncytial pattern having small to medium sized nuclei, abundant eosinophilic granular cytoplasm and mild atypia.

No evidence of necrosis/ or atypical mitosis was seen that rules out the possibility of malignancy. Immunohistochemistry markers S100, CD68 were positive while PAN-CK was negative. The final diagnosis was rendered as granular cell tumour.

Discussion

GCTs are uncommon neoplasms that can occur in various anatomical locations with tongue and soft tissues being the most frequent sites of origin, while breast GCTs account for approximately 5–15% of all GCT cases[9]. The majority of these tumours are benign, with only less than 1% exhibiting malignant characteristics. GCTs usually present as solitary, painless masses in upper inner quadrant of breast along the distribution of supraclavicular nerve whereas malignant breast carcinoma commonly presents as upper outer quadrant mass[6].

On histology, infiltrating sheets or cords of polygonal bland cells with well-defined cell borders, having abundant eosinophilic granular cytoplasm and round to oval nuclei with prominent nucleoli along with collagenous stroma are the features of breast GCTs[8]. According to the criteria proposed by Fanburg-Smith *et al*, six features;

necrosis, vesicular nuclei with large nucleoli, high NC ratio, pleomorphism, spindling tumour cells, and an accelerated mitotic rate (>2/10hpf) favour the diagnosis of malignant GCTs. Abrikossoff first described the tumour type to be originating in the skeletal muscle[2]. Immunohistochemical profiling suggests that they are unlikely to be of muscle (because of negativity for alpha-smooth muscle actin) or epithelial (because of negativity for keratin or epithelial membrane antigen) origin. Later, researchers proposed that the tumours originate from the Schwann cells because of their S-100 protein positivity and the similarity of the tumour cells to Schwann cells[4,5].

Pathological examination with immunohistochemical staining, particularly for S-100 protein, is crucial for confirming the diagnosis of GCTs. GCTs typically exhibit negative expression ofoestrogen, progesterone, and androgen receptors, indicating a lack of direct influence by sex hormones on tumour development[6]. Axillary lymph node staging is non suggested for benign GCTs as they do not spread to regional lymph nodes. Postoperative surveillance for approximately 10 years is recommended, along with the evaluation and reporting of surgical margins to prevent recurrences. These tumours have an extremely favourable prognosis and adjuvant chemotherapy or radiation has not been shown to improve survival.

Conclusion

Our case report contributes to understanding the importance of considering frozen section and histopathological examination before carrying out a major surgery.Treatment consisting of complete excision with close clinical follow up is recommended.

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References

1. Fink T, Deb S, Clouston D, Thornton C, Chakrabarti A. Novel case of a granular cell tumour mimicking breast malignancy and a metachronous axillary skin lesion. J Surg Case Rep 2022;2022(3):rjac140.
2. Damiani S, Dina R, Eusebi V. Eosinophilic and granular cell tumours of the breast. Semin DiagnPathol 1999;16:117-25.
3. Abrikossoff A. Uber Myome, ausgehend von der quergestreiftenwilkuerlichenmuskulatur. Virchows Arch Pathol Anat 1926;260:215–33
4. Dhillon AP, Rode J. Immunohistochemical studies of S100 protein and other neural characteristics expressed by granular cell tumour. DiagnHistopathol 1983;6(1):23–8
5. Fujiwara K, Maeda I, Mimura H. Granular cell tumour of the breast mimicking malignancy: a case report with a literature review. Acta Radiol Open 2018;7(12): 2058460118816537.
6. Oberc A, Armstrong K, Ko H-M, Grant A, Mullen JBM, Williams P. Case report of a breast granular cell tumour in a young transgender man. Int J Surg Case Rep 2022; 93:106978.
7. Pujani M, Singh K, Raychaudhuri S, Agarwal C, Khandelwal A, Menia R, et al. Granular cell tumour breast masquerading as a malignancy cytologically: a rare case presenting a diagnostic dilemma. Indian J Surg Oncol. 2020;11(2):321-4.
8. Akahane K, Kato K, Ogiso S, Sakaguchi K, Hashimoto M, Ishikawa A, et al. Malignant granular cell tumour of the breast: case report and literature review. Breast Cancer. 2015;22(3):317–23.
9. Akbari A, Behravan P, Moradi A, Akbari ME. Case Report of a Benign Granular Cell Tumour Resembling Breast Carcinoma in a Young Woman: A Diagnostic Challenge. Case Rep Oncol 2024; 3;17(1):608-13.