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Presentation of a Case Report and Literature Review on Granular Cell Tumour of the Breast

Raymond Akpobome Vhriterhire[1*], Joseph Aondowase Ngbea[1], David Gyenger[1] and B. A. Eke[2]

[1]Department of Anatomical Pathology, College of Health Sciences, Benue State University, Makurdi, Nigeria.
[2]Department of Surgery, College of Health Sciences, Benue State University, Makurdi, Nigeria.

Authors' contributions

This work was done in collaboration with all authors. The case report was conceptualized by authors RAV and BAE. The initial draft of the case report manuscript was prepared by authors RAV and DG. Authors JAN and BAE reviewed and edited the final manuscript. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

A 21 years old woman presented with a breast swelling of 4 years duration and with an associated pain of a more recent onset. On clinical examination, the mass was found to be firm, mobile and without attachment to the skin or surrounding structures. An excisional biopsy was performed based on a provisional clinical diagnosis of fibroadenoma. However, histological evaluation showed the tumour to be a granular cell tumour. The clinical features of this rare tumour may mimic a variety of conditions and cause a diagnostic dilemma.

Keywords: Breast tumour; breast cancer; granular cell tumour; fibroadenoma.

1. INTRODUCTION

Granular cell tumour is a rare soft tissue tumour, considered to be of Schwann cell origin and it was first fully described in 1926 by Abrikossoff [1]. This tumour occurs rarely in the breast with case reports from different regions of the world and few studies in series conducted to elicit its

**Corresponding author: E-mail: akp4ray@yahoo.com;*

characteristics [2]. The main concern about granular cell tumour (GCT) of the breast is its tendency to create a diagnostic dilemma by mimicking other benign or malignant tumours clinically and radiologically [3]. We present a case of granular cell tumour in a 21 years old woman which was initially considered to be a fibroadenoma.

2. CASE REPORT

A twenty – one years old Para 0^{+0} woman came to the Benue State University Teaching Hospital with a complaint of 4 years history of a right breast lump and an associated pain of about 2 years duration. There was no bloody nipple discharge and she had no family history of cancer. The patient noticed a recent progressive increase in the size of the tumour. On examination, the mass was found to be located at position 12 o'clock from the nipple, 2 × 3 cm, and freely mobile, not attached to surrounding structures. As shown on Fig. 1, a real time high resolution ultrasound evaluation of the right breast was done using a 7.5 mHz linear transducer. A fairly round predominantly hypoechoic mass with regular margins located 4.0 mm from the skin was observed. The mass measured 11.9 × 11.8 mm. At this point a diagnosis of fibroadenoma was considered.

The patient was worked up for surgery and an excision biopsy was performed to remove the tumour. The excised specimen was preserved in 10% formalin solution. On gross examination, there was a fibrous capsule and it was firm and measured 3 × 2 × 2 cm. A cut section through it revealed a white capsule and a yellow – gray solid firm core (Fig. 2). The tissue was processed routinely and sections made from the paraffin blocks were stained with haematoxylin and eosin. Histological evaluation showed normal breast acini and ducts. Sheets of large polygonal cells were found infiltrating the fibro-collagenous stroma of the breast (Fig. 3). As shown on Fig. 4, each cell was large and had a granular eosinophilic cytoplasm and a dark centrally located nucleus. There was neither necrosis nor cells with dysplastic nuclei or features of malignancy. There was a sprinkling of lymphocytes throughout the lesion. A final histological diagnosis of a benign granular cell tumour of the breast was made. The tumour was completely excised and there was no recurrence or complication observed after two months.

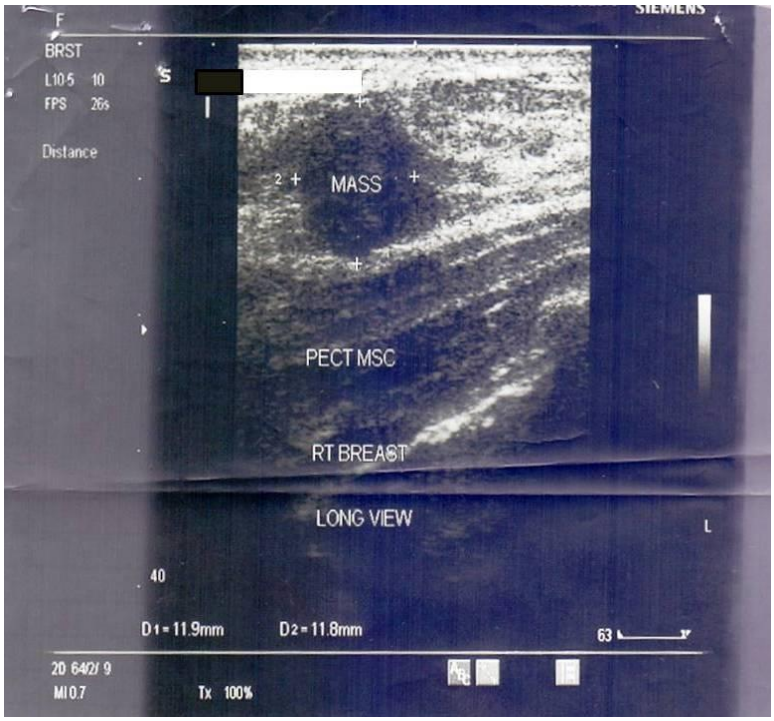

Fig. 1. Granular cell tumour of the breast ultrasonography

This shows the mass as a hypoechoic region which measured approximately 1.2 x 1.2 cm. Calcifications were not found. This was a real time scan performed at 7.5 mHz using a linear transducer

Fig. 2. Breast granular cell tumour gross specimen

The mass was hard and had a thick fibrous capsule. A cut section showed a yellowish solid surface that was somewhat greasy

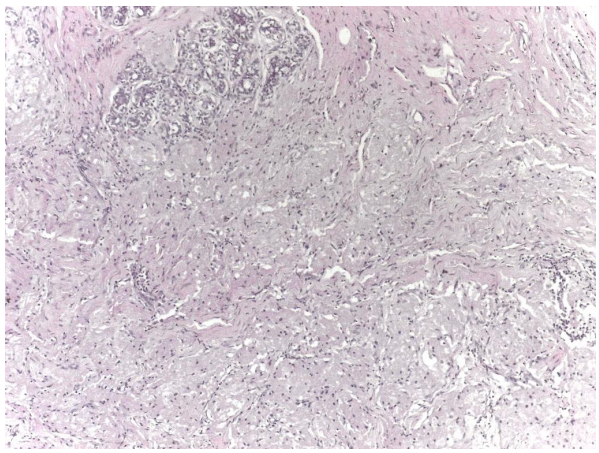

Fig. 3. Granular cell tumour of the breast

A crop of ducts can be seen at about position 11 o'clock at this scanning magnification. The rest of the field consists of a fibrocollagenous stroma within which is a sheet of the tumour cells with relatively paler granular cytoplasms. There are small clusters and a sprinkling of lymphocytes also present. H & E, x 4 objective magnification

3. DISCUSSION AND REVIEW OF LITERATURE

Granular cell tumour has been reported to occur in the soft tissues of the head, neck and other regions of the body including the larynx [4], suprasellar space [5], nasal septum [6], oral mucosa [7], mediastinum [8], buttock [9], vulva [10], back [11], rectum [12], etc. Granular cell tumour of the breast is rare and only a few case series have been studied so far [2].

The rarity of this condition has been reflected in the low frequency figures reported in papers from different places in Nigeria. In Kano, 0.9% (9/1035) was observed [13], while in Warri and Makurdi, 0.62% (n=4/644) and 0.7% (n=1/135), respectively, of benign breast conditions, were previously reported [14,15]. Breast GCT is mostly seen in females and only a handful of cases have been observed in males [16]. The case in our study occurred in the breast of a 21 years old female. Although many of the cases reported in the literature were in women older than 30 years, mostly in the perimenopausal age bracket, occurrence in a 19 years [17] as well as in an 82 years [18] old women have been documented in the literature. Thus, the age of the reported case is similar to previous reported cases. A male:female ratio of 1:9 has been described for breast GCT making occurrence in male breast to be very rare [19,20].

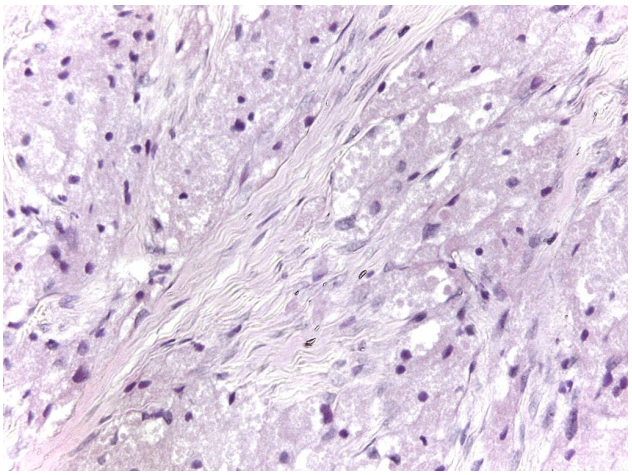

Fig. 4. Granular cell tumour of the breast

The tumour cells have a well delineated cell margins and large abundant cytoplasms containing eosinophilic granules. Each cell has a darkly staining centrally located oval nucleus. Wisps of connective tissue stroma consisting of fibroblasts with curved and spindled nuclei are seen in the centre of the field bisecting the sheet of tumour cells. H & E, x 40 objective magnification

Similar to the present case, most reports have described this tumour as a solitary lesion in the breast [21-23] but metachronous occurrence involving other parts of the body other than the breast have also been reported [1]. In this case, there was no evidence suggestive of occurrence of any tumour involving other areas of the body. The patient complained of pain in the affected breast. Pain in the affected breast is probably an uncommon feature because most cases reported occurred as painless breast masses [3].

In the index case, clinical and ultrasound evaluation were suggestive of a fibroadenoma. A similar case where GCT presented like a fibroadenoma was reported by Filipovski et al [24]. A review of 1703 surgical pathology specimens suggest that a diagnostic discrepancy is 1.7 times more likely to occur in the diagnosis of a benign breast tumour (discrepancy rate: 12.8%, n=125) than in a malignant one (discrepancy rate:7.7%, n=117) [25]. A greater concern is when the tumour mimics a malignancy clinically as differentiation may often be difficult and this may affect management plans. A number of authors have written on this kind of occasional diagnostic dilemma [18,26,27].

The literature suggests that a granular cell tumour is more likely to be malignant when it occurs in other regions of the body, other than the breast [8,28]. Malignant GCT of the breast is extremely rare and only a number of cases have been reported [29,30]. The distinction between a benign and a malignant GCT is important because many benign forms have infiltrative borders [31] and although most breast GCT are predominantly benign, this distinction is necessary for appropriate management decisions. Fanburg – Smith et al in a seminal paper proposed a set of six histological criteria for categorising a case of GCT into benign, atypical or malignant. These criteria include the presence of necrosis, spindling, vesicular nuclei with large nucleoli, mitosis, nuclear-cytoplasmic ratio and pleomorphism [32,33]. Employment of these criteria for GCT of extremities by some workers demonstrated that when combined with clinical features, the Fanburg – Smith criteria can reliably differentiate between benign and malignant forms of this disease [33,34]. Subsequently, this has been applied satisfactorily to GCT of the breast [29]. In our case, the tumour did not present any feature suggestive of malignancy. All cases of CGT are usually positive to S100 immunohistochemical staining [35].

Predictably, the literature shows that the tumour has a good prognosis when completely excised and a low recurrence rate. The woman in the case presented was healthy about two months after surgery without any complaints or signs of recurrence. Most papers report non-recurrence weeks or months after a wide margin resection [36,37]. However, despite the reassurances provided by these reports, a word of caution is necessary when handling a case of granular cell

tumour. Papala et al. examined the margin status of breast biopsies from 13 female patients with granular cell tumour. After the patients were followed up for an average of 77 months, the group concluded that there is a little long-term risk of recurrence of this tumour [2]. This underscores the importance of carefully examining the resection margins of all biopsy specimens during histological evaluation. One of the patients had a co-existing invasive ductal carcinoma. In a similar vein, a case reported by Al-Balas et al was that of a GCT diagnosed in 71 years old woman followed about a year later by observation of an invasive ductal carcinoma in the same breast [21]. Whether this tumour was truly of recent onset or co-existed with the GCT and only missed on the initial evaluation, is just a matter of conjecture.

4. CONCLUSION

Granular cell tumour of the breast is a rare soft tissue tumour which may cause a clinical diagnostic dilemma by mimicking other benign or malignant diseases of the breast clinically or radiologically. An accurate diagnosis depends of histological evaluation. However, the tumour is mostly benign and has a good prognosis following a wide local resection.

CONSENT

As per international standard informed and written participant consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard written ethical permission has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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