

Granular cell tumour of the breast - diagnostic radiology case study

A 53 year old female patient presented with a suspicious palpable breast mass with a clinical and radiological suspicion of malignancy. Histological evaluation, however, revealed a rare benign neoplasm. Granular cell tumor is a rare neoplasm that may occur in any anatomical part of the body, most commonly the tongue. GCT of the breast is commonly a benign neoplasm. However, clinically and radiologically it can mimic breast malignancy. It commonly presents as a painless palpable lump while the sonogram and mammogram are variable. FNA or core needle biopsy is diagnostic and wide local excision is the choice of management.

KEYWORDS: granular cell tumor ▪ breast cancer ▪ benign neoplasm ▪ sonogram ▪ mammogram ▪ pathology

Introduction

Granular cell tumor (GCT) is a rare neoplasm that may occur in any anatomical part of the body, most commonly within the oral cavity, the tongue. The first reported case of granular cell tumor involving the tongue was in 1926 by Abrikosoff who proposed the possible origin of GCT from striated muscle cells and he termed this lesion as myoblastoma. However, the histogenesis of this tumor is controversial and currently, the most accepted theory is that it arises from Schwann cell. GCT is commonly benign, however malignant GCT have been reported and comprises less than 2% of GCTs. There have been cases reported of breast GCT synchronous with infiltrating ductal carcinoma. GCT is commonly benign, however malignant GCT have been reported and comprises less than 2% of GCTs. There have been cases reported of breast GCT synchronous with infiltrating ductal carcinoma.

Commonly GCT of the breast is seen in women and rarely in the male breast. It can present as a solitary lump or multi-centric within the breast or other parts of the body.

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GCT of the breast accounts for 5-6% of all GCT, approximately 1 per 1,000 cases of breast cancer. Most cases are found in the middle-aged, premenopausal women and more common in African Americans ethnicity.

Clinically, GCT presents as a painless palpable breast mass with a firm to a hard consistency that is common in the upper inner quadrant.

FNAC and core needle biopsy are always diagnostic.

The radiological features are variable, many radiological features are suggestive of breast cancer, that can redirect the management towards unnecessary radical surgical mastectomy, where wide margin excisional surgical removal is the effective management for benign GCT where no axillary lymph nodes involvement.

Increasing the level of knowledge and awareness to include GCT in the differential diagnosis of and suspicious painless breast lump will redirect the management pathways and will have great impacts on health care system, socioeconomic aspects, and patient safety.

Case history

A 53 year old female patient presented with a suspicious palpable breast mass with a clinical and radiological suspicion of malignancy. Histological evaluation, however, revealed a rare benign neoplasm.

Referral to Hospital Kuala Lumpur (HKL) from a private center following a screening mammogram which revealed a left breast lump. Upon further history taking and clinical examination revealed that patient was previously under surgical clinic follow up for a then non-palpable left breast lump since 2001 [1]. The lesion was detected on the mammogram and biopsied sometime in 2004 by the surgical team. The patient was told that the lesion was benign in

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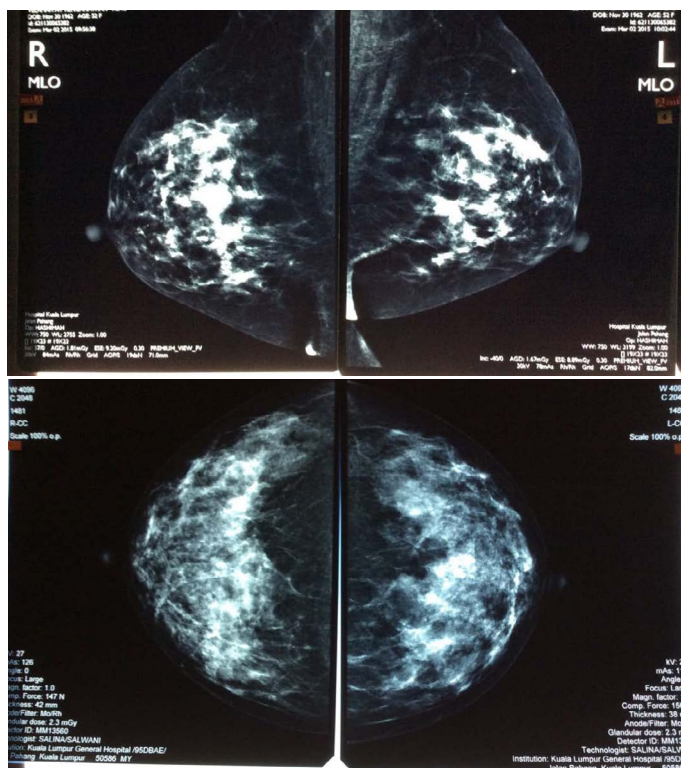


Figure 2. Mammogram done in 2015. A & B: MLO & CC views.

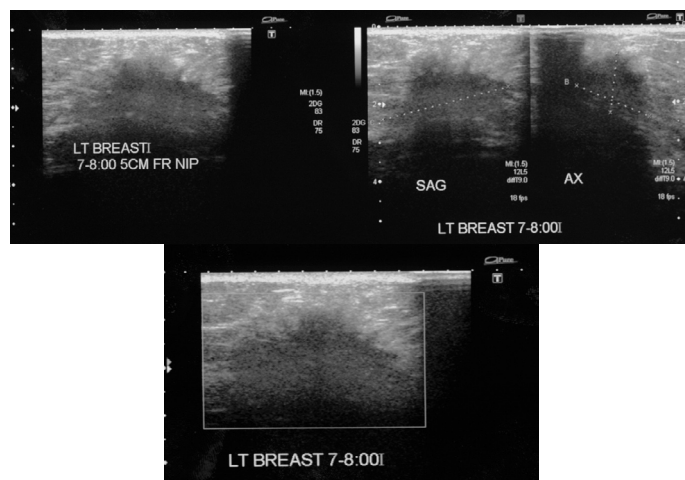


Figure 3. A, B & C: Ultrasound images of the speculated hypoechoic mass with posterior shadowing, at 7-8 O'clock position in the left breast.

that is common in the upper inner quadrant [11]. GCT can also cause skin retraction and ulceration, due to its infiltrating growth pattern and close apposition to the pectoralis muscle and fascia.

The radiologic features of GCT of the breast are variable.

By ultrasound, it could be seen as a solid, hypoechoic, poorly margined mass, associated with posterior acoustic shadowing or as a

more benign- appearing well-circumscribed mass with posterior acoustic enhancement. In Mammogram it may present as a round or smooth lobulated, well-circumscribed configuration or as an ill-defined spiculated mass. Microcalcifications are not present [2].

In a case series by Irshad et al, the sonographic and mammographic appearances of GCT were also found to be variable [12]. The common sonographic features of GCT were a hypoechoic lesion and taller than wider (height to width

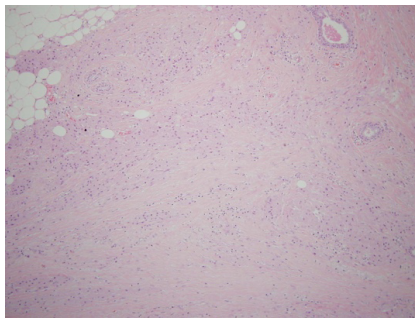


Figure 4. Tumour within collagenous stroma.

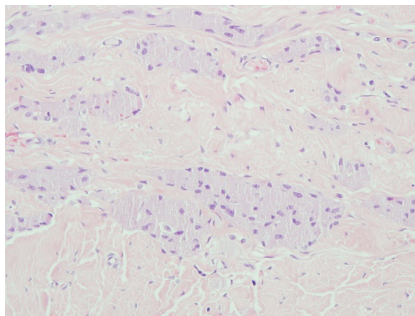


Figure 5. Clusters of polygonal cells with uniform round nuclei, abundant granular cytoplasm & distinct cell border. They are surrounded by collagenous tissue stroma.

Table 1. Mammogram report in 2011.

Clinical Correlation			
Clinical presentation (2011)	Right	Left	Remarks
a. Lump in breast	-	-	
b. Nipple discharge	-	-	
c. Nipple reaction	-	-	
d. Discomfort/tenderness/pain	-	-	
e. Axillary node swelling	-	-	
Relevant Personal History	Yes	No	Remarks
1. Personal history of breast cancer		/	
2. First degree relatives with breast cancer		/	
3. Previous breast surgery or trauma		/	
4. HRT		/	
5. Birth control pills	/		2002-2005
6. Breast fed children			
7. Any previous MMG			
Radiological Findings		Remarks	
Mammogram findings	Bilateral dense breast with scattered microcalcifications		
Mass	No dominant mass bilaterally		
USG	Not done		
Impression	No mammographic evidence of malignancy		
Follow up	Routine		

ratio>1). While the mammographic findings of the tumor showed speculations with no calcification [13].

These findings on both sonography and

mammography show that GCT mimics breast malignancy.

Investigation

FNAC and core needle biopsy are always

Table 2. Mammogram report in 2015.

Clinical Correlation			
Clinical presentation (2015)	Right	Left	Remarks
a. Lump in breast	-	/	
b. Nipple discharge	-	-	
c. Nipple reaction	-	-	
d. Discomfort/tenderness/pain	-	-	
e. Axillary node swelling	-	-	
Relevant Personal History	Yes	No	Remarks
Personal history of breast cancer		/	
First degree relatives with breast cancer		/	
Previous breast surgery or trauma		/	
HRT		/	
Birth control pills	/		2002-2005
Breast fed children	/		
Any previous MMG	/		
Radiological Findings		Remarks	
Mammogram findings	Bilateral dense breast with scattered microcalcifications		
Mass	No dominant mass bilaterally		
USG	Right breast – NAD Left Breast – an irregular hypoechoic lesion at 7-8 O'clock (Lower inner quadrant) measuring 1.5 × 2.1 × 3.4 cm)		
Impression	Suspicious left 7-8 O'clock breast lesion, BIRADS 4		
Follow up	US guided biopsy March 2015 (5 attempts made, however only 1 sample attained. Decision made for excision biopsy		

diagnostic. However, in our patient biopsy attempt failed as the mass was too hard to attain good sample. Hence a wide local excision of the tumor was done.

Macroscopically, GCT appears firm to hard mass and grayish to yellow in color in its cross section [14]. Microscopically, it shows the abundance of eosinophilic cytoplasm that has a granular appearance caused by the accumulation of mitochondria, secretory granules and lysosomes [15].

There have been case reports where MRI and PET were carried out for a pre-operative diagnosis of GCT. Dynamic MRI showed strong enhancing lesion with peripheral rim enhancement and no washout phenomenon.

While PET, visual analysis did not show a focal enhanced tracer accumulation and quantitative image analysis (FDG uptake by tumor) using average SUV revealed less than the threshold SUV of 2.5, which was used to differentiate benign and malignant lesion [14].

However neither of these imaging was done in our patient, because the patient underwent surgery.

Based on a study conducted by Papalas et al. [16] it was noted that the risk of disease progression was low. Despite resection of the tumor with positive margins, there was no recurrence of tumor up to 7years post resection. However, long-term follow-up of patients is recommended as recurrence after 10years post resections have been reported [16].

Management

Wide local excision with clear margin is the surgery of choice for benign GCT. Axillary clearance is not necessary as nodal involvement is rare. Chemotherapy and radiotherapy have no role in benign GCT of the breast. However, the same can't be said for its malignant counterpart. Malignant GCT has been reported to be progressive with metastasis and thus may require chemo or radiotherapy in its management [17].

Conclusion

In conclusion, GCT of the breast is a rare

benign neoplasm, which appears to present clinically and have radiological features that are more aggressive than it truly is. Awareness of its many variable presentations will benefit both the radiologists and surgeons.

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