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REVIEW

# Granular cell tumour of the breast

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**Abstract**
Granular cell tumour of the breast (GCTB) is a rare tumour which arises from Schwann cells. It is a largely benign tumour but in extremely rare cases can exhibit malignant characteristics. It posses a particular problem as it's characteristics can mimic breast carcinoma clinically, radiologically and macroscopically. This results in the potential misdiagnosis of breast carcinoma and over treatment of patients. Typically GCTBs are benign, solitary lesions but variations include malignant GCTBs, colocalisation with breast malignancies and multicentricity. These tumours can be investigated using mammography, ultrasound and magnetic resonance imaging. However none of these modalities have yet identified any GCTB specific characteristics. On pathological examination they can be identified using both microscopic and immunohistochemical features. The cells have a distinctive granular *eosinophilic* cytoplasm associated with typical nuclei and abundant lysosomes. Immunohistochemically they are positive for S100 protein, CD68 and neuron specific endolase (NSE). They are treated with wide local excision and while they may reoccur, are associated with a good prognosis.


**Contents**



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## Introduction

Granular cell tumours (GCT) were first alluded to by Weber in 1854 and fully described by Abrikossoff in 1926 [1,2]. They were originally noted in the tongue but connected to the breast by Abrikossoff in 1931 [2]. GCTs are by large benign tumours which may be subcutaneous, intradermal or submucosal [1]. They can occur in any body site and may be multifocal [3] with head/neck, chest wall and arms being the most common sites [1,4]. GCTs of the breast (GCTB) account for between 5 and 15% of all GCTs [1,4—6]. Although rare they are of particular significance as they mimic scirrhous breast malignancies and are hard to distinguish from them via clinical, radiological or observational techniques [6—8]. Misdiagnosis of malignancy can lead to inappropriate radical treatment resulting in unnecessary physical and psychological hardship [9]. As such these tumors have been widely discussed in the literature, the findings and conclusions of which are summarised here.

A GCTB prevalence of 1:1000 cases of breast malignancy has been widely stated however current evidence suggests a prevalence of 1:617 among the screened population and 6.7:1000 cases in the total clinical population [2,7,10,11]. These epidemiological findings indicate that GCTB is of higher clinical significance than previously recognised and should be routinely considered in the differential diagnosis of breast masses.

This review will explore the clinical presentation, pathology, imaging and treatment options of GCT of the breast.

## Methods

A search of electronic databases OVID MEDLINE and ENTREZ PUBMED was conducted to identify all publications pertaining GCT specifically of the breast. Searches retrieved 133 papers regarding GCTB published between 1989 and 2008. Of the 133 publications 45 were relevant and comprised of 14 case series and 31 case reports yielding 91 cases for review (Table 1) [1—46].

## Clinical presentation

GCTBs arise from intralobular breast stroma and occur within the distribution of the cutaneous branches of the supraclavicular nerve [10]. They display no side preference. They were thought to occur largely in the upper inner quadrant of the breast compared to breast malignancies which show a predisposition to the upper outer quadrant [10]. However case analysis elicited a wide variety of locations including the upper outer quadrant, the upper inner quadrant, the axilliary tail, the midline, the nipple and the subaerola region with the majority of cases located in the upper outer quadrants [1—46].

GCTB is largely a disease of females as is the case in breast malignancies but has been described in males as well in 6.6% of GCTB cases [1,3,7,15,46]. It is a disease of adulthood although it has been reported also in childhood [1]. It has been noted that GCTB is most common in premenopausal women with a quoted median age of 40 years [1,4,10,43]. However within the cases reviewed the mean age was 53.5 years. Case series by Gibbons et al. Damiani et al. and Yang et al. all show a majority population of African American ethnicity as has previously been stated in the literature [3,4,14,15].

Historically breast masses were solely identified by palpation. Since the introduction of breast screening extensive assessment of the female population has occurred. This has led to the identification of asymptomatic patients and higher GCTB rates of detection in older age