Benign Granular Cell Tumor Mimicking Male Breast Carcinoma: A Case Report

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We report a 52-year-old male with preoperative physical and mammographic findings highly suggestive of breast carcinoma with axillary lymph node metastasis. He received modified radical left mastectomy. Final diagnosis was granular cell tumor of the breast, confirmed by histology and immunohistochemical staining. Although rare in the male breast with clinical and radiological presentation similar to breast carcinoma, granular cell tumor should be listed in the differential diagnosis in male patients with suspected breast carcinoma. Preoperative tissue diagnosis such as aspiration cytology or core needle biopsy can provide important information and proper treatment planning.

Key words: Breast; Granular cell tumor; Mammography

Granular cell tumor (GCT) is an uncommon soft tissue neoplasm most commonly appears in the tongue. Occasionally it can be located in the breast, mimicking breast carcinoma clinically and radiologically [1-3]. Wide excision with tumor-free margin is the treatment of choice. GCT of the male breast is even rarer, with sporadic case reports in the medical literature [4, 5]. We recently encountered a male patient with GCT of the breast with preoperative clinical and radiological findings mimicking breast carcinoma. The lesion turned out to be GCT by histologic examination and immunohistochemical staining after surgical resection.

CASE REPORT

A 52-year-old male presented with a lump in his left breast for more than one year. Retraction of left nipple was noticed one week before visiting the outpatient clinic. Physical examination revealed a 1.5cm hard mass in the subareolar region of left breast with retracted nipple. Enlarged left axillary lymph nodes were palpated. Mammogram showed predominantly fatty breasts and a 1.5cm ill-defined, high-attenuated mass in subareolar region of left breast leading to retraction of the nipple. There was no microcalcification (Fig. 1a, 1b). Additional compression spot film of left breast on mediolateral oblique view revealed spiculation of the tumor (Fig. 1c). The mammographic findings favored breast carcinoma. The patient received modified radical left mastectomy and left axillary lymphadenectomy. Frozen section revealed features suggesting granular cell tumor. The resected tumor appeared as a 1.5 × 1 × 0.9 cm irregular greyish firm mass without invasion of the overlying skin or the deep pectoralis fascia. Histologically, the tumor was infiltrative and was composed of cells with abundant eosinophilic granular cytoplasm (Fig. 2a). No tumor necrosis or conspicuous nuclear pleomorphism was seen. The mitotic activity was low. No conventional ductal carcinoma in situ was identified. The lymph nodes were free from metastatic tumor. Immunohistochemically,
the granular cells were positive for S-100 protein (Fig. 2b), neuron-specific enolase (NSE) and inhibin, but were negative for cytokeratin. Some CD68-positive cells were found. The overall picture indicated a diagnosis of granular cell tumor. The postoperative course was uneventful.

**DISCUSSION**

Granular cell tumor (GCT) is first described by Abrikossoff as granular cell myoblastoma in 1926, with histologic resemblance of tumor cells to the striated muscle [6]. A neural origin from Schwann cell has been advocated with immunohistochemical and electron-microscopic findings [4, 5]. It is a soft tissue tumor most commonly seen in the tongue, but can also be seen in almost all body parts [3]. GCT of the breast accounts for 5 to 8% of all GCTs [2-4], arising from interlobular breast stroma. It occurs more often in African American, middle-aged and

**Figure 1.** Bilateral mediolateral oblique a. and craniocaudal b. mammogram showed a 1.5 cm ill-defined, high-attenuated mass in subareolar region of left breast. Retraction of left nipple was seen (arrowheads). c. Compression spot film of left breast on mediolateral oblique view revealed spiculation of the mass.

**Figure 2.** a. Histologic examination showed an infiltrative tumor composed of cells with abundant eosinophilic granular cytoplasm, low activity of mitosis and no evidence of malignancy (H&E 400x). b. Immunohistochemical staining was positive for S-100 protein (400x).
Granular cell tumor of the male breast

premenopausal women [3, 4]. Multifocal GCTs in patients with GCT of breast and occasionally malignant cases have been described [1]. The lesion usually manifests as a painless, firm, mobile mass [2], and frequently occurs in the upper inner quadrant corresponding to the area of innervation of the skin of the breast by the suprACLavicular nerve [1]. In contrast, breast carcinomas occur more commonly in the upper outer quadrant. Retraction of the overlying skin and fixation can occur when the tumor is situated superficially [4]. Extension of tumor to the axillary tail of breast has been reported [3]. The overall clinical presentation of GCT is similar to that of breast carcinoma.

Only 20 cases of GCT in the male breast have been reported before 1998, with a male-to-female ratio of 1:9 [5]. The mean age of these patients at time of operation was forty, younger than those with male breast cancer. The clinical presentations of GCTs in the male and female breasts are also similar, with no distinct differences in the male group [1, 4, 5].

The mammographic presentation of GCT is variable. They may present as round, circumscribed masses with well-defined borders, as indistinct densities, or as spiculated masses [1, 2]. Microcalcifications are not usually present. In a nineteen-case series, twelve lesions were imaged in eleven patients, with three mammographically occult lesions. The other nine were seen as irregular, spiculated masses without calcification [3]. Case reports of GCT in the male breast described variable mammographic appearance ranging from stellate mass with irregular border to well-defined high density mass with minimal spiculation [4, 5]. On the other hand, in male breast carcinoma, the margin may be well-defined, ill-defined, smooth or spiculated. The contour may be round, oval, or irregular, and are frequently lobulated. Microcalcifications are uncommon and, if present, are fewer in number, coarser, and less frequently rod-shaped than those seen in female breast cancer. Secondary features include skin thickening, nipple retraction, and axillary lymphadenopathy [8, 9]. The presence of any solid mass should raise suspicion of malignancy [9]. There is marked overlapping of mammographic appearance in GCT and carcinoma of the male breast.

GCT of the breast accounts for approximately one in every 1000 breast cancers [1], with a male-to-female ratio of 1:9 [5]. However, male breast carcinoma represents only 0.6% of all breast carcinomas [7]. The true ratio of GCT to carcinoma in the male breast may be difficult to estimate due to relatively small total case numbers of both tumors. More cases for analysis are needed for better understanding of the clinical and radiological characteristics of this tumor.

In our case, the tumor appeared as a high density mass with speculated irregular border, nipple retraction, and clinically palpable axillary lymphadenopathy. There was no microcalcification. Thus, the preoperative diagnosis based on clinical and radiological findings was breast carcinoma.

Sonographically, GCT may manifest as a solid mass with a poorly-defined margin and marked posterior acoustic shadowing. It may also have a more benign appearance with more circumscribed border and posterior acoustic enhancement [1, 2, 5]. The ultrasound appearance of male breast carcinoma may have the same features as those seen in females [9]. Invasive breast cancers are typically solid, and all solid lesions require biopsy [10]. Ultrasonographic distinction between GCT and breast carcinoma may be difficult.

In most cases, correct diagnosis of GCT is made by histologic examination. Grossly, it may be well circumscribed or poorly circumscribed. In cross section, it usually appears as a firm, grayish-white to yellow mass [1, 3]. On frozen section, its poorly defined margin and infiltrative growth pattern may confuse pathologists [5]. Microscopically, nests and sheets of polygonal cells with distinct borders and abundant granular eosinophilic cytoplasm is characteristic [1]. Nuclei are usually small, centrally located and hyperchromatic. Minimal mitotic activity may be present. Immunohistochemical staining is positive for S-100 protein, reflecting the putative Schwann cell origin. [1, 3, 4, 5]. GCT may also stain positively for neuron-specific enolase, vimentin, and CD68 in some cases [3, 5]. Fine needle aspiration cytology is another modality for achieving a correct preoperative diagnosis of GCT. One study demonstrated correct diagnosis by using this method in 9 of 13 GCTs [3].

The treatment of choice for GCT in breast is complete surgical excision with margins free from tumor [4], since most lesions are benign. Local recurrence has been reported after incomplete excision. In our case, the presence of clinically palpable axillary lymph node prompted modified radical mastectomy with lymphadenectomy despite frozen section result suggested features of granular cell tumor. Correct preoperative diagnosis can be made by aspiration cytology to prevent unnecessary rad-
ical mastectomy. However, in most cases, histologic examination is necessary to establish the true nature of the lesion [1].

In conclusion, GCT is a rare, usually benign tumor in the male breast. Its clinical, mammographic and sonographic findings mimic those of breast carcinoma. Wide excision is the treatment of choice once the correct diagnosis is made pathologically. GCT has a better prognosis than breast cancer. When encountering a lesion highly suspicious for breast carcinoma in the male breast, we should be aware of the possibility of GCT and include it into the list of differential diagnosis. Preoperative tissue diagnosis such as aspiration cytology or core needle biopsy can provide important information and proper treatment planning.

REFERENCES
似男性乳癌之良性顆粒細胞瘤：病例報告

陳一方 許清寅 吳淑萍 黃榮貴

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我們報告一五十二歲男性病例，術前之臨床及乳房攝影表現高度懷疑為乳癌併腋下淋巴結轉移。病人接受左乳房切除術，術後組織學及免疫組織化學染色證實為乳房之顆粒細胞瘤。顆粒細胞瘤在男性乳房極為少見，大多為良性且預後良好，其臨床與影像表徵皆與乳癌極為相似。因此，在高度懷疑有乳癌的男性患者，乳房顆粒細胞瘤應列入鑑別診斷。術前最好有細胞或病理診斷，以提供較好的處理規劃。

關鍵詞：乳房，顆粒細胞瘤，乳房攝影