Granular Cell Tumor of the Breast in a Chinese Woman Mimicking Breast Cancer-Case Report and Literature Review

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Abstract

1. Granular cell tumor of the breast is rare but benign in most conditions.
2. GCTB is very easy to be misdiagnosed as primary breast cancer clinically.
3. GCTB is reported to be more common in pre-menopausal African American female but few in Asia.
4. Here we present the first Chinese woman with GCTB mimicking breast cancer.
5. In the condition that this woman was strongly against needle biopsy and was scheduled to receive mastectomy by another hospital, wide local excision was managed reasonably and successfully.

Introduction

Granular cell tumor (GCT) was described first in the tongue (1926) and later in the breast by Abrikosoff (1931) [1,2]. It was ever thought to originate from skeletal muscle at first and then from peripheral nerves. Now it has been recognized to occur in various sites including the oral cavity, head, neck, chest wall, and digestive tract [3].

GCT of the breast (GCTB) is rare, accounting for 5-6% of all GCTs. It is usually benign with an exception of only 5 malignant cases reported globally [4,5]. As a solid tumor of the breast, the incidence of GCTB is extremely low compared with breast carcinoma with a rate of about 1 to 1000 [6]. GCTB is reported to be more common in pre-menopausal African American females than white and Asian females [4,7]. To date there are no reported cases of GCTB from China.

Although GCTB is usually benign, it can be misdiagnosed as a primary breast cancer because of its mimicking features and rare incidence. GCTB can manifest as a firm and non-movable mass with distinct borders and spiculations both mammographically and sonographically, which can mimic that of breast cancer in most situations. Therefore fine needle aspiration and core needle biopsy should be very helpful to the diagnosis of GCTB.

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Here, we present a postmenopausal Chinese woman with GCTB. And also the challenge of treatment is that this woman was strongly against needle biopsy.

Case Presentation

A 53-year-old postmenopausal woman presented with a 2-week history of a painless mass in the upper inner quadrant of her left breast. She had no family history of any cancer. Clinical breast exam revealed a 3 cm, firm, non-movable mass. Axillary lymph nodes were not enlarged. Upon presentation at another hospital, she got a clinical diagnosis of breast cancer and had been scheduled to receive mammary radical mastectomy. She refused needle core biopsy because she was extremely concerned about spreading cancer cells along the needle biopsy track. Ultrasound showed a 2.4 x 2.0 x 1.8 cm hypoechoic, hypovascular mass with indistinct borders at 10’clock. It was close to the underlying pectoralis major muscle but was not obviously invading the muscle (Figure 1).
Mammography revealed a round mass close to the pectoralis major muscle with subtle spiculations at the margin (Figure 2).

The round mass shows partly in CC view but entirely in XCCM view. It is close to the pectoralis major muscle in the MLO view and the arrows in the last enlargement view show subtle spiculations at the margin.

The patient underwent a wide local excision of the left breast mass. Pathological examination of the frozen section did not reveal a typical infiltrating breast cancer but suggested "suspicious GCTB". Then incision was closed and the patient got her breast saved happily for she had been diagnosed breast cancer and scheduled to receive mammary radical mastectomy by the former hospital. Final pathology confirmed the diagnosis of GCTB. It revealed typical granular cells with abundant pink granular cytoplasm and small, hyperchromatic nuclei (Figure 3). The margin was tumor free (Figure 4). The immunohistochemistry showed the tumor was positive for S-100 and negative for AE1/AE3, CgA and SMA. The immunostains were positive for S-100 protein.

Discussion

GCTB is a rare disease without enough data until now. The largest reports come from United States in which it is reported to be more common in African American female at a ratio ranges from 70% to 94% [4,7-17]. There are also some sporadic cases from Asia but no report in Chinese woman throughout pubmed [4,7].

Based on current theory that GCT is thought to be likely from Schwann cells of peripheral nerves. GCT can happen every site where peripheral nerves exist. GCTB arises from intralobular breast stroma within which the cutaneous sensory branches of the supravacuicular nerve distribute. While the cutaneous branches of supravacuicular nerve spreads in a fan-like direction in the upper inner quarter of the breast, that give us a good explanation why GCTB is most commonly seen in the upper inner quarter of the breast [11].

Clinically, GCTBs present typically as firm, palpable masses between 1cm to 3cm in size. They occur more frequently in the upper inner quarter [4,7] in contrast to breast carcinoma, which is more usually located in the upper outer quadrant. GCTBs can cause dimpling of skin, infiltration, or ulceration, all features that mimick the appearance of breast cancer and can lead to an incorrect clinical diagnosis [12].

Mammographically, they can appear as an isodense mass with indistinct or spiculated margins. Sonographically, they sometimes show the characters such as heterogeneous echotexture, indistinct margins and hypervascularity [7,11,13]. Many infiltrating breast cancers have similar imaging findings.

Grossly, GCTB is usually firm, grayish white to yellow mass. Fine needle aspiration cytology sometimes is useful and experienced cytopathologists look for cells with ill-defined abundant granular cytoplasm and bland, regular small and round nuclei which support the diagnosis of GCTB [14,15]. Core needle biopsy is very helpful and 70% patients were diagnosed by core needle biopsy in Irshad’s report [7]. GCTB characteristically shows typical granular cells with abundant pink granular cytoplasm and small, hyperchromatic nuclei in routine pathology [12]. High mitotic rate, cellular and nuclear pleomorphism, and the presence of necrosis suggest malignant
GCTB (MGCTB) [16]. In most of these tumors, the immunostains are positive for S-100 protein, which favors the theory of its neural origin.

Wide local excision with free margin is the appropriate treatment for GCTB [4,12], especially in the condition which pre-operation pathology is uncertain or invalid. The recurrent rate after wide local excision is low. In Papalas’ report, all patients which included 15% patients with positive margins and 31% with close margins (tumor cells within 1mm) remained disease free during a 77-month follow-up [17]. However, there are only 5 cases of MGCTB reported in the English-language literature [16]. In the recent report from Japan, a female in her 80’s who underwent local and axillary recurrence 15 months after local excision received MRM and then died of liver and lung metastasis 34 months after primary surgery. The author suggest that wide local excision with axillary lymph node dissection, clear margin and close follow-up are necessary if the pathology reveals MGCTB [16].

Conclusion

We report the first case of GCTB in Chinese woman mimicking breast carcinoma clinically and radiologically. Wide local excision with free margin is reasonable when pre-operation pathology is not valid. It is very important that surgeons and pathologists are aware of this entity and do not mistake it for breast cancer and proceed to mastectomy without definitive histology.

References