CASE REPORT

Granular Cell Tumor: A Case Report

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Abstract

Granular cell tumor (GCT) of the breast is a rare neoplasm. These tumors are most commonly found on the tongue (40% of cases); only 5-6% of GCTs occur in the breasts. A 46-year-old woman presented with recent onset of a palpable lump, confirmed by mammography and sonography, in the axillary tail of the left breast. Imaging findings were highly suspicious for breast neoplasm. Anatomic pathology findings were descriptive and inconclusive, revealing proliferation of cells with granular eosinophilic cytoplasm. The recommended treatment for GCT is wide local excision, and there are no data to support adjuvant radiation or chemotherapy.

Keywords: granular cell tumor; breast; Schwann cells.

Introduction

Granular cell tumor (GCT) of the breast is a rare neoplasm, comprising approximately 5–6% of all GCTs. The most common site of occurrence is the tongue (40% of cases), but GCTs have been
described in a variety of locations. These neoplasms arise from Schwann cells or primitive neural cells and are mostly benign, although rare cases may exhibit malignant features. Their clinical and radiological features may resemble those of breast cancer because GCTs have no distinguishing imaging characteristics. On histopathological examination, GCTs have infiltrative borders and the cells display abundant granular eosinophilic cytoplasm and benign nuclear features. The recommended treatment is wide local excision and there are no data to support adjuvant radiation or chemotherapy.

Case Report

A 46-year-old woman presented with a recent-onset lump in the axillary tail of the left breast first detected on mammography 2 months before. Mammographic findings were highly suspicious, suggestive of carcinoma, and the report described a spiculated nodule in the axillary tail extending from the upper quadrants of the left breast. Ultrasonography revealed a 1.2 x 1.1-cm spiculated lesion at the transition between the outer quadrants and left axillary region (figure 1). The patient had no family history of breast cancer or other neoplasms, no surgical history and no comorbidities other than smoking. Onset of menopause had occurred 2 years before presentation, at age 44.

Figure 1 – Ultrasonography showing suspicious nodule
Physical examination revealed a bulge at the boundary of the upper left quadrant and axilla, with no dimpling and an approximately 1.0-cm lump (difficult to palpate) in the same location. The right breast had no abnormalities on inspection and no palpable nodules. Palpable axillary lymph nodes were absent bilaterally. An ultrasound-guided biopsy of the aforementioned lesion was performed. The core-biopsy specimen consisted of two thin strands of elastic brown tissue, the largest measuring 1.2 x 0.2 cm. On microscopic examination, H&E-stained slides revealed a proliferation of cells with abundant granular eosinophilic cytoplasm, small nuclei, inconspicuous nucleoli and scant micronodular intracytoplasmic eosinophilic inclusion bodies (Figure 2). Paraffin pathology examination was considered inconclusive, and immunohistochemistry testing was indicated to rule out carcinoma and confirm the histopathological diagnostic hypothesis of granular cell tumor.

Figure 2 – Granular cells showing abundant eosinophilic cytoplasm with scant micronodular intracytoplasmic eosinophilic inclusion bodies (H&E stain, x400 magnification)

Immunohistochemical analysis revealed cytoplasmic and nuclear positivity for S-100 (Figure 3). The specimen was negative for all other epithelial markers assessed (low molecular weight cytokeratin [CK8]; cytokeratin cocktail [AE1 & AE3]; epithelial membrane antigen [EMA]) and for inhibin-alpha. The specimen was also negative for estrogen receptors and the proliferative index (Ki-67) was low (<1%). The overall impression was consistent with granular cell tumor and excisional biopsy was recommended.
Figure 3 – Granular cells showing cytoplasmic and nuclear positivity for S-100 marker (S100 immunostain, x400 magnification).

The excisional biopsy specimen was a round sample of adipose tissue (2.8 cm in the longest axis). Sections were cut and revealed a firm, dull, whitish, radial-appearing lesion (dimensions: 1.5 x 1.4 x 1.1 cm). Microscopic examination confirmed the diagnosis of benign granular cell tumor, with no areas of nuclear atypia or high mitotic index anywhere in the specimen (Figure 4).

Figure 4 – Infiltrative granular cell tumor edge (H&E stain, x100 magnification.)
Discussion

GCTs are most commonly found in the head and neck region (>50% of cases), particularly the tongue (approximately 40%); GCTs of the breast are unusual, accounting for approximately 1 in every 1,000 breast neoplasms (1). GCTs are typically solitary lesions measuring less than 3.0 cm, located in the dermis or subcutaneous tissues (or less commonly in the submucosa or smooth or striated muscle) and may be benign or malignant, although the latter are extremely rare; fewer than 2% of all GCTs are malignant. Premenopausal women are the most frequently affected group, with a mean age at presentation of 40.3 years (1).

GCTs of the breast are most commonly found in the upper inner quadrant (1), in the cutaneous territory of the supraclavicular nerve (2), although the case reported herein occurred in the axillary tail of the left breast.

Current mammographic screening practices have led to an increase in diagnosis of these tumors among asymptomatic patients. In a recent review, 70% of breast GCTs were first detected by palpation, versus 26% by screening mammography and 4% during follow-up of patients with a history of breast cancer (3). From a clinical and radiological standpoint, GCTs of the breast or axillary tail constitute a substantial diagnostic challenge in view of their rarity, usual size (up to 3.0 cm) and infiltrative pattern, which makes them palpable, firm and consistent with malignant masses even on mammography (3-11).

Several mammographic appearance patterns have been described for GCTs, from well-circumscribed masses to indistinct, spiculated lesions. Microlcifications are unusual (2). On ultrasonography, GCTs may present as a solid mass with poorly defined margins and marked posterior shadowing or with more a benign appearance, as a well-circumscribed solid mass (2). In a study of the sonographic features of GCTs, Yang et al (12) showed that 5 out of 7 studied lesions had an echogenic halo or were partially hyperechoic. These features were attributed to the infiltrative growth pattern of GCTs.

On gross pathology, GCTs are firm, yellow to yellow-brown masses and can thus mimic invasive carcinoma. Only on histological examination do these tumors reveal their characteristic benign features, completely distinct from the majority of breast neoplasms. Nevertheless, GCTs may still be confused with two types of breast carcinoma: invasive ductal carcinoma of the apocrine type, foamy cell type B (13, 14); and histiocytoid breast carcinoma, which some authors consider a variant of lobular carcinoma (15). Despite a histological pattern mimicking GCT, both tumor types also exhibit
the nuclear atypia characteristic of carcinoma, usually with an in situ neoplastic component and always express cytokeratins on immunohistochemical testing (15, 16). Therefore, immunohistochemistry is essential (particularly so in small biopsy specimens) to help rule out carcinoma and confirm the diagnosis of GCT. As in the case described herein, GCTs are negative for all commonly used epithelial markers and positive for S-100.

Most authors attribute the origin of GCTs to primitive neural cells (17-22). It bears stressing that fewer than 2% of GCTs display malignant features, which include dimensions above the average of 3.0 cm, nuclear atypia and necrosis—none of which were observed in the present case—and high mitotic index, which is ruled out by the low proliferative index (Ki-67) (23-25). Nevertheless, complete excision is advisable to allow thorough, definitive histopathological analysis of the lesion.

Conclusion

Granular cell tumor of the breast is a rare, benign neoplasm. It must be remembered as a clinically rare but important differential diagnosis, as it may mimic clinical and radiological aspects of breast carcinoma. Total excision is recommended to enable thorough, definitive histopathological diagnosis.

References


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