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PRIMARY GIANT CELL TUMOR OF SOFT TISSUE IN THE FEMALE BREAST: A CASE REPORT

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ABSTRACT

A giant cell tumor of soft tissue (GCT-ST) is a rare tumor composed of mononuclear and osteoclast-like multinucleated giant cells. It is a low-grade malignant potential tumor that is morphologically analog to a giant cell tumor of bone. The superficial and deep soft tissue of extremities is the most frequent site of this tumor which is cured by complete or radical resection. GCT-ST is exceedingly rare arises as a primary tumor in the female Breast. Presentation of osteoclast-like multinucleated giant cells in the breast tumor has been described in association with the variant of breast carcinoma. We report a case of primary GCT-ST arising in the female Breast without a relationship with the epithelial component. To the best of our knowledge, this is the fifth such case report, and only the second one occurred in a female under 50 years.

Keywords: Breast, Giant cell tumor, Soft tissue.

INTRODUCTION

A giant cell tumor of soft tissue (GCT-ST) is an uncommon low malignant potential tumor that usually occurs in the superficial and deep soft tissue of extremities.¹ Histologically, GCT-ST has identical features to its counterpart, the giant cell tumor of bone. The major components of these tumors are mononuclear cells and osteoclast-like multinucleated giant cells. Clinically, both GCT-ST and GCT of bone tend to local recurrence but rarely metastasize.²

Primary GCT-ST that arises in the female Breast is extremely rare. Osteoclast-like multinucleated giant cells in the breast tumor have been described in association with the variant of breast carcinoma. We report a case of primary GCT-ST arising in the female Breast without union with the epithelial component and without a history of other diseases. To the best of our knowledge, this is the fifth such case report, and only the

second one occurred in a female under 50-year-old.

CASE PRESENTATION

We received a tissue specimen of left breast post lumpectomy from a peripheral hospital for pathology consultation. Clinical description: A 45-year-old woman was admitted to the hospital with a history of a painless lump in the upper left Breast. She and her family did not have a history of malignancy. She had no symptoms of systemic diseases, bone pain, and weight loss. A palpable, firm, well-defined, and non-tender mass about 2 cm in diameter was revealed during physical examination. There was no tangible lymph node in the area of the axilla, axilla, supraclavicular and infraclavicular. An excisional biopsy was performed, and the tumor mass was sent to our laboratory for histopathological examination.

Grossly, the tumor was a well-defined, solid, white, brown mass. Macroscopically, the tumor was cellular and composed of a

mixture of the round to oval mononuclear cells and multinucleated osteoclast-like giant cells. The characters of stromal and giant cells were similar with vesicular nuclei, prominent nucleoli, and abundant eosinophilic granular cytoplasm. The tumor cells were mildly pleomorphic with minimal mitotic activity. Stroma was richly vascularized, and there was central hemorrhage without necrosis (Figure 1). CD 68 marked the multinucleated giant cells strongly, while the mononuclear cells showed only focal staining (Figure 2A). Cytokeratin was negative in both mononuclear and multinucleated giant cells (Figure 2B). Our final diagnosis was a giant cell tumor of soft tissue with low malignant potential. The patient was referred to our hospital then and received adjuvant radiotherapy. There is no evidence of recurrent tumor two years after surgery.

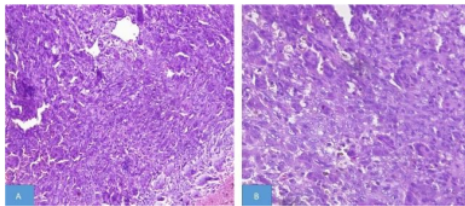


Figure 1: A. Histologic picture of GCT-ST with the area of hemorrhage at the lower right. B. Tumor cells were mildly pleomorphic with minimal mitotic activity. (HE, 200x, and 400x, respectively).

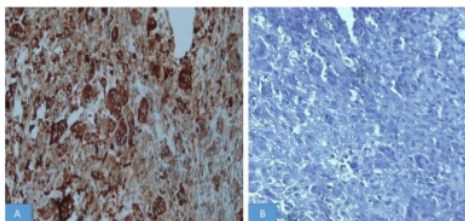


Figure 2: A. CD 68 was strongly positive in the cytoplasm of the giant cells (IHC, 400x). B. Cytokeratin was negative in both giant cells and mononuclear cells (IHC, 400x).

DISCUSSION

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We present a case of a 45-year-old woman with GCT-ST of the Breast. Histopathological evaluation revealed a solid neoplasm with a hemorrhage area composed of mononuclear cells and multinucleated osteoclast-like giant cells. There was no bone component within the tumor. Both types of tumor cells were positive for CD68, a histiocytic marker, and negative for cytokeratin, an epithelial marker immunostains, suggesting that those cells were mesenchymal in origin. Following the WHO classification, this tumor was consistent with GCT-ST of the Breast. The copyright form is located in the authors' reserved area.

Giant cell tumor of soft tissue (GCT-ST) is a primary soft tissue neoplasm that affects patients ranging in age from 5 to 89 years, predominantly in the fifth decade of life. In 1972, Salm and Sissons for the first time described this tumor in a report on benign cases.³ In the same year, Guccion and Enzinger described those cases with malignant behavior.⁴ Most of the cases occur in the superficial soft tissue of the extremities, less of them affect the trunk, head, and neck region.²

Primary GCT-ST of the Breast is exceedingly rare. There were only four reports that were diagnosed as primary GCT-ST previously. Three of them occurred in the > 50-year-old woman⁵⁻⁷, and one case occurred in a 36-year-old lady.⁸ There is no definite etiologic factor for GCT-ST. It has rarely happened in patients with Paget disease of bone or after trauma.^{2,5} In primary GCT-ST of the Breast, one case was reported in a patient with a family history of endometrial carcinoma.⁸

Grossly, most of the GCT-ST involved dermis or subcutaneous adipose tissue. Tumors ranged in size from 0.7 to 10 cm. It usually presents as a well-circumscribed solid mass with a fleshy, red-brown, or gray cut surface.^{2,9} Some cystic features also have been reported.^{5,8,9} Histologically, this tumor is composed of a mixture of mononuclear

and multinucleated osteoclast-like giant cells, but the diagnosis depends on the background component of mononuclear cells. The absence of bone involvement is a must for the diagnosis. The metaplastic bone formation is present in approximately 50% of the tumors, and frequently it is in the form of a peripheral shell of woven bone. It may be induced by the tumor cells' secretion of Transforming Growth Factors beta 1 and 2.^{2,5,9} In our case, clinical and radiological evidence showed no bone involvement.

Malignant progression of this tumor can be identified by evidence of sarcomatous changes of the mononuclear cells like the area of hemorrhage, necrosis, cellular pleomorphism, and nuclear atypia with high mitotic activity. Typical mitosis usually found in this tumor range from 1 to 30 figures per 10 HPF.¹⁰ Immunohistochemistry of GCT-STs show reactivity for CD68, vimentin, and smooth muscle actin.² In this case, CD68 was strongly positive in multinucleated giant cells and showed focal stains in mononuclear cells. Vimentin and smooth muscle actin were not stained. We used cytokeratin to distinguish GCT-ST from breast carcinoma with giant cell differentiation. It was negative for cytokeratin in both mononuclear and multinucleated giant cells.

Primary GCT-STs of the Breast, like their bone or soft tissue counterparts, have low malignant potential biological behavior. Based on the literature, two cases had 1-2 years alive without recurrence^{7,8}, but this cannot be predicted because one case had lung metastases and death in 10 months post-surgery.⁵ No clinicopathological factors can be used to predict metastatic behavior associated with GCT-ST. The incidence of local recurrence is high in incomplete surgical excision.^{2,9} Complete surgical resection has been acknowledged as a mode of treatment for GCT-ST by some surgeons. However, to avoid the possibility of local recurrence, clinical follow-up with or

without postoperative radiotherapy is advised after resection.⁹ In our case, the patient was alive with no evidence of recurrence two years after the operation.

In conclusion, GCT-ST in the Breast is an uncommon case. Clinical, radiological, and histopathological findings are significant in the diagnosis of this tumor because of its similarity to GCT of bone. Immunohistochemical assessment to differentiate mesenchymal and epithelial components is important to exclude the diagnosis of mammary carcinoma with giant cell differentiation.

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