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Priya K Umare
Post Graduate Student, Department of Pathology, S.R.T.R. Government Medical College, Ambajogai, Maharashtra, India

Sandhya Narwade
Assistant Professor, Department of Pathology, S.R.T.R. Government Medical College, Ambajogai, Maharashtra, India

Sunil Yogiraj Swami
Associate Professor, Department of Pathology, S.R.T.R. Government Medical College, Ambajogai, Maharashtra, India

Corresponding Author:
Sunil Yogiraj Swami
Associate Professor, Department of Pathology, S.R.T.R. Government Medical College, Ambajogai, Maharashtra, India

A case report-giant cell tumour of soft tissue with low malignant potential in right axilla: A case report

Priya K Umare, Sandhya Narwade and Sunil Yogiraj Swami

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Abstract
Primary giant cell tumour of soft tissue [GCT-ST] is a rare entity that is considered the soft tissue equivalent of giant cell tumour of the bone. It most commonly arises in soft tissues of the trunk and extremities, with occurrence in the head and neck being extremely rare. They are composed of nodules of histiocytes in a vascular stroma, with multinucleated osteoclast-like giant cells positive for vimentin, smooth muscle actin [SMA], CD68 and Tarterate Resistant Acid Phosphatase [TRAP]. Giant cell tumour of soft tissue is a rare primary soft tissue tumour with low malignant potential.

Keywords: Giant cell tumour, soft tissue, axilla, immunohistochemistry

Introduction
GCT-ST is a rare and unusual tumour named for its histological and clinical similarities to giant cell tumour of bone. Despite its often benign clinical course, with moderate rate of recurrence and low rate of metastasis, the limited data on GCT-ST lend itself to a relatively small pool of information regarding clinical presentation, diagnosis, treatment, and outcomes [1, 2, 3, 4].

GCT-ST is a rare neoplasm that was first described in 1972 [5, 6]. Due to its histological and immunohistochemical similarities with GCT of bones, GCT-ST is thought to be its counterpart [7]. GCT-ST is characterized by the presence of spindles or polygonal mononuclear cells and multinucleated osteoclast like giant cells [6]. Atypia and necrosis are present in the malignant form of GCT-ST.

GCT-ST is most commonly found in superficial soft tissue of upper and lower extremities, especially on hands, arms, and feet [8-13]. There is no predominant age group affected by the tumour specifically, as it occurs in a broad age range from 5 to 84 years with no sex predilection [12-14].

Differential diagnosis should include benign lesions such as GCT of tendon sheaths, cellular dermatofibroma with osteoclast-like giant cells, ossifying dermatofibroma with osteoclast-like giant cells, reparative giant-cell granuloma, nodular fasciitis, and brown tumour of hyperparathyroidism extending to soft tissues and malignant lesions like leiomyosarcoma with osteoclast-like giant cells, epithelioid sarcoma with giant cells, extra-skeletal osteosarcoma, atypical fibroxanthoma with osteoclast-like giant cells, and plexiform fibro-histiocytic tumour [15-17].

Case Report
A 66 year old female presented with left axillary mass for 2 months. On examination, a 5x7 cm, non-tender, mobile swelling was noted in the left axilla. Both the breast were normal with no evidence of lymphadenopathy. Axillary lumpectomy was done.

On gross, the cut section of the lump [Fig. 1] revealed a well circumscribed mass with a thin capsule and areas of subcapsular haemorrhages.

Microscopically [Fig. 2] showed tumour tissue composed of lymphocytes, plasma cells, spindle cells and plenty of multinucleated osteoclast like giant cells. Focal areas of hyalinization and haemosiderin laden macrophages were also seen.

Immunohistochemistry [Fig.3] revealed strong positivity for SMA, vimentin in the spindle cells, and CD68 positivity in the giant cells leading to the final diagnosis of GCT-ST with low malignant potential.

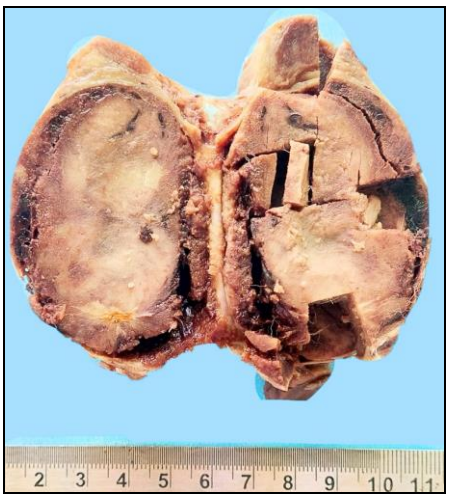

Fig 1: Gross: Showing cut section of a well circumscribed axillary mass tissue with areas of haemorrhages at the periphery

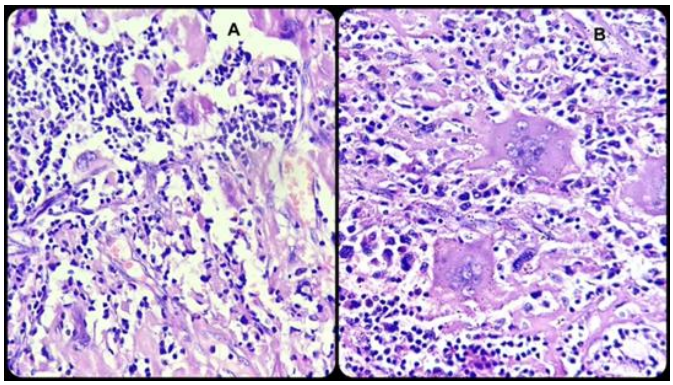

Fig 2: Showing tumour tissue composed of lymphocytes, plasma cells and plenty of multinucleated osteoclast like giant cells and focal hyalinization. [H&E: A:10X; B:40X]

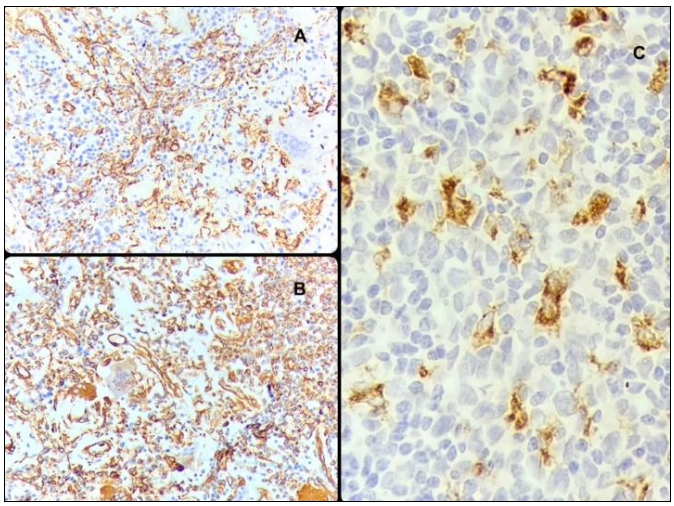

Fig 3: IHC: Showing tumour tissue [A, B]: composed of smooth muscle cells strongly positive for SMA and vimentin respectively; [C]: Giant cells positive for CD68. [IHC: 40X]

Discussion

Primary GCT-ST was first described in 1972 by Salm and Sissons, who refined the diagnostic criteria to include only those tumours of soft tissue containing osteoclastic giant cells similar to those encountered in giant cell tumour of bone, thereby classifying GCT-ST as a clinical entity distinct from other, albeit similar, soft tissue lesions [3, 18]. These tumours have been described in numerous anatomic sites including extremities, trunk, head and neck, superficial and deep fascia and skeletal muscle [19].

The main differential diagnosis includes benign fibrous histiocytomas [BFH] with giant cells, angiomatoid fibrous histiocytomas [AFH], plexiform fibro-histiocytic tumours, nodular fasciitis with giant cells, solitary reticulohistiocytoma, giant cell tumour tendon sheath (GCTTS), amelanotic melanomas, giant cell reparative granuloma (central giant cell tumours), and giant cell rich malignant fibrous histiocytoma.

The spindle cells, histiocytes and haemosiderin laden macrophages are characteristic of benign fibrous histiocytomas which are frequently seen in head and neck area and commonly involve dermis [19, 20]. Osteoclast-like giant cells can occur in BFH [21, 22]. The lack of whirling, predominance of histiocytes having indented nuclei and expression of smooth muscle actin in the histiocytes, made this diagnosis unlikely.

AFH show histiocyte-like cells and vascular spaces lined by histiocytes, but they also have a dense lymphoplasmacytic cuff at the periphery, which was lacking in our case [19].

Plexiform fibro-histiocytic tumours occur exclusively in children and they are composed of histiocytes and giant cells arranged in nodules, circumscribed by short fascicles of fibroblastic cells in deeper dermis and subcutis. Although these histiocytes and multinucleated giant cells express CD68, they lack smooth muscle actin [19].

Nodular fasciitis with giant cells can occur at any age and site. It is composed of plump myofibroblasts arranged in short irregular bundles in a myxoid matrix admixed with scattered lymphocytes, macrophages and multinucleated osteoclast-like giant cells. However, smooth muscle actin is expressed only in the spindle cells; the mononuclear and multinucleated histiocytes are negative [19].

Solitary reticulohistiocytoma develop in adults at any site. They show oncocytic epithelioid histiocytes positive for CD68 and lysozyme and multinucleated giant cells. SMA is usually not expressed [23]. The histiocytes in our case lacked the abundant eosinophilic cytoplasm and they expressed smooth muscle actin.

Amelanotic melanomas show marked pleomorphism and are negative for smooth muscle actin [24].

GCTTS is an extraarticular counterpart of pigmented villonodular synovitis, that is composed largely of mononuclear histiocytoid cells with scattered osteoclast and touton type of giant cells, with xanthoma cells. It is different from GCTSP because of its usual localization near joint spaces or bursae. Metaplastic bone production is not commonly seen in GCTTS. Both tumours are composed of large mononuclear histiocytoid cells and osteoclast type giant cells, but touton type giant cells are also present in GCTTS. The ratio of giant cells to mononuclear cells is reversed in these two lesions. Unlike GCTTS, large amounts of dense fibrous tissue are absent or scarce in GCTSP [25, 26].

The extra-articular form of diffuse-type tenosynovial GCT was first described by Jaffe *et al*. [27] Diffuse-type GCTs are now classified as fibrohistiocytic tumours in the World Health Organization [WHO] system of classification of bone and soft-tissue tumours [28]. Unlike localized types, these tumours are aggressive and recur in 33- 50% of the cases, often with multiple recurrences. A long-term following up is needed in our case.

GCTSP should be considered different from giant cell rich malignant fibrous histiocytoma [MFH] because the latter is a more aggressive, high grade malignant tumour. Giant cell rich MFH is a multinodular, storiform-pleomorphic MFH

with marked cytologic atypia, atypical mitoses, and benign osteoclast-like giant cells. However, GCTSP lack the numerous atypical mitoses and coagulative tumour cell necrosis typical of giant cell rich MFH. Giant cell forms of malignant fibrous histiocytomas and epithelioid sarcomas display significant nuclear atypia, necrosis and increased mitosis, which were lacking in our case [19].

Giant cell reparative granuloma or peripheral giant cell granuloma [PGCG] arises exclusively from the periodontal ligament enclosing the root of a tooth. This unique origin means that such a lesion can only be found within or upon the gingiva or alveolar ridge. Apart from the rather significant difference in location, giant cells in PGCG tend to have fewer nuclei and irregular shapes. They have propensity for clustering around areas of necrosis and haemorrhage, while those in GCTSP are more evenly distributed. There is an increased incidence of osteoid, haemorrhage, and hemosiderin in PGCG compared with GCTSP [26].

Approximately, 70 cases of GCT-ST have been described in the literature [8]. Giant cell tumours of soft parts have now been reclassified as GCT-ST (i.e., giant cell tumour of low malignant potential) and undifferentiated pleomorphic sarcoma with giant cells (i.e., giant cell malignant fibrous histiocytoma or malignant giant cell tumour of soft parts) in the 2002 WHO classification of tumours of soft tissue and bone [20].

Immunohistochemically, we tested for vimentin, CD68, and SMA. CD68 immunoreactivity is frequently strong and diffuse in the multinucleated giant cells, whereas it is focal in the mononuclear cells as seen in our case.

Conclusion

GCT-ST is rare, the pathogenesis of this tumour is still unclear, and the effective adjuvant therapy after operation is also under exploration. We have described a rare case of GCTST involving the axillary area. Combination of histopathology and immunostains for smooth muscle actin and CD68 confirmed the diagnosis and ruled out the various neoplastic and non-neoplastic differential diagnoses which vary in therapeutic aspects.

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