Giant cell tumor of soft tissues of low malignant potential: A rare diagnosis on fine needle aspiration cytology

ABSTRACT
Primary giant cell tumors of soft tissues (GCT-ST) are extremely rare soft tissue tumors, located in both superficial and deep soft tissues. They resemble osseous giant cell tumors morphologically and immunohistochemically. The tumor exhibits strong positive immunoreactivity for cluster of differentiation 68 (CD68) within multinucleated osteoclast-like giant cells and focal staining of mononuclear cells. Case reports describing the cytohistological features of this entity are very few. We report a case of GCT-ST of low malignant potential diagnosed on fine needle aspiration (FNA) and confirmed on histological and immunohistochemical studies.

Key words: Cytology, giant cell tumor, soft tissue

Introduction
Primary giant cell tumors of soft tissues (GCT-ST) are extremely rare soft tissue tumors, located in both superficial and deep soft tissues. Morphologically and immunohistochemically, they resemble osseous giant cell tumors. They can be seen in all age groups and most of the reported cases have been in extremities, with thigh being the most common site.[1] The term, giant cell tumor of soft tissue of low malignant potential, has been proposed. The term malignant giant cell tumor of soft tissue is restricted to histologically high grade lesions.[2] The tumor exhibited strong positive immunoreactivity for cluster of differentiation 68 (CD68) within multinucleated osteoclast-like giant cells and focal staining of mononuclear cells.[3] Provided that GCT-ST is treated adequately by complete excision; a benign clinical course is expected because episodes of distant metastasis and tumor-associated death seem to be exceedingly rare.[4] Case reports describing the cytohistological features of this entity are very few. We report a case of GCT-ST of low malignant potential diagnosed on fine needle aspiration (FNA) and confirmed histologically.

Case Report
A 33-year-old female came to the surgical outpatient department with swelling over the right thigh since 2 months. The swelling was gradually increasing in size. The overlying skin showed puckering. The swelling was nontender and hard on palpation. Systemic examination was noncontributory.

Magnetic resonance imaging (MRI) of the right thigh was done that showed 3 cm × 2.5 cm × 1.5 cm T1 and T2 hypointense mass lesion with significant postcontrast enhancement noted in the posterolateral aspect of the upper third of the thigh. The lesion was extending up to the vastus lateralis. There was no bone erosion. The provisional diagnosis of soft tissue sarcoma was given. The patient was referred...
Kulkarni, et al.: Giant cell tumor of soft tissues of low malignant potential

to the cytology department. FNA was done. Smears were prepared and stained with leishman and hematoxylin and eosin stain. The smears were cellular and showed bimodal population. There were clusters of spindle cells with bland nuclei [Figure 1a]. These were traversed by fibrovascular septae. Additionally seen were two multinucleate giant cells with oval nuclei [Figure 1b, inset]. The nuclei resembled the nuclei of the spindle cells. The background was hemorrhagic. Mitotic figures were absent. Considering clinical history, radiological finding, and cytomorphology, the diagnosis of giant cell tumor of low malignant potential was suggested. The tumor was excised and sent for histopathological examination. We received a soft tissue mass measuring 8 cm × 6 cm × 3 cm. Subcutaneous tissue showed a tumor measuring 2.5 cm × 2.2 cm × 2 cm. The tumor was grayish white, nodular, and hard in consistency. Microscopically an ill-circumscribed tumor composed of short fascicles of spindle cells with ovoid nuclei was seen. Multinucleated giant cells were dispersed uniformly among these tumor cells. Mitotic count was 3 to 5/10 high-power fields (HPF). There were focal areas of osseous metaplasia. Base and resection margins were free of tumor. Immunohistochemical study was done with CD68 (clone 514 H12) and Ki 67 (clone MM1, Novacstra). CD68 showed diffuse and strong immunoreactivity in the multinucleated giant cells and focal immunoreactivity in the mononuclear cells. Ki 67 index was 12-15%. The diagnosis of giant cell tumor of low malignant potential was confirmed. The patient remained well and asymptomatic after tumor removal.

Discussion

GCT-ST is a rare tumor first described in 1972 by Salm and Sisson and followed shortly by Gruccione and Enzinger.[5] The histogenesis is unclear and the behavior is dependent upon the location, size, and microscopic appearance. Low- and high-grade forms have been separated from each other on the basis of the atypia, pleomorphism, and mitotic activity of the mononuclear neoplastic component.[2]

Case reports describing cytomorphological features of GCT-ST of low malignant potential are rare. Cytological features of GCT-ST in a 58-year-old woman with a well-demarcated dermal tumor has been described.[6] Their case showed numerous osteoclast-like giant cells and mononuclear cells with a bland nucleus. They concluded that primary GCT-ST should be considered in a differential diagnosis of bland-looking giant cell lesion. A case of superficial thigh mass diagnosed on cytology is reported.[7] Differential diagnosis of GCT-ST includes soft tissue mesenchymal tumors rich in giant cells.[8] These include tenosynovial giant cell tumor and malignant giant cell tumor of soft parts. Apart from significant difference in location, tenosynovial giant cell tumor contains heterogeneous population of cells including xanthoma cells, siderophages, and lymphocytes. Giant cell form of malignant fibrous histiocytoma by definition contains mononuclear and giant cells with significant levels of atypia. Atypical mitotic figures and necrosis are present. GCT-ST is differentiated from fibrohistiocytic tumor by the bimodal population of cells.[9] In our case, the tumor did not show any pleomorphism or cellular atypia and proliferation index was 3-5%, which suggests a slightly raised proliferative activity.[10] Ki67 labelling index can be used as an indicator of low malignant potential. Epithelioid sarcoma is differentiated by the presence of prominent nucleoli, cellular trails, and keratin that are absent in GCT-ST.

Conclusion

In conclusion, GCT-ST occurs as a primary, soft tissue neoplasm, and it is identical clinically, morphologically, and immunohistochemically to giant cell tumor of bone. Complete excision of the GCT-ST results in a benign clinical course because episodes of distant metastasis and tumor-associated death seem to be exceedingly rare. GCT-ST should be considered in a differential diagnosis of a giant cell rich spindle cell lesion of soft tissue. Our case highlights that GCT-ST can be diagnosed cytologically in an appropriate clinical setting.

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Conflicts of interest
There are no conflicts of interest.

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