
Case 7

Malignant Soft Tissue Myxofibrosarcoma

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History

A 57-year-old female treated for myxofibrous sarcoma presents with suspected recurrence in the left leg (Fig. 7.1).

Diagnosis

Malignant soft tissue myxofibrosarcoma

Findings

- T1-weighted image shows a mildly hyperintense lesion in the musculature posterior to the left fibula (arrowheads).
- T2-weighted images show the lesion to be isointense to the muscle, irregular, and somewhat heterogeneous.
- PET/MR fusion shows a prominent hypermetabolic focus in the musculature posterior to the left fibula compatible with malignancy.
- After gadolinium administration, the lesion shows heterogeneous enhancement with infiltration along the fascial planes (thin arrows).

Discussion

Myxofibrosarcoma is an aggressive soft tissue neoplasm that is classified as a type of malignant fibrohistiocytic tumor. It exhibits high local recurrence and metastatic rate. It commonly presents in the sixth decade as a painless soft tissue mass within the extremities.

On MRI, the myxoid component of myxofibrosarcoma is often low in signal on T1-weighted images and high on T2-weighted and STIR sequences. On T1-weighted post-contrast imaging, the myxoid component typically does not enhance, while the surrounding tumoral and reactive tissue may enhance. T2-weighted and gadolinium-enhanced sequences are the best at evaluating the infiltrative pattern of myxofibrosarcoma.

This tumor characteristically spreads along fascial planes, often outside of the primary tumor focus. Given this type of spread, MRI alone may not be adequate in delineating the surgical margin. A subset of patients with superficial fascial infiltration will show a characteristic “tail-like” pattern on contrast-enhanced images which is associated with a poorer prognosis.

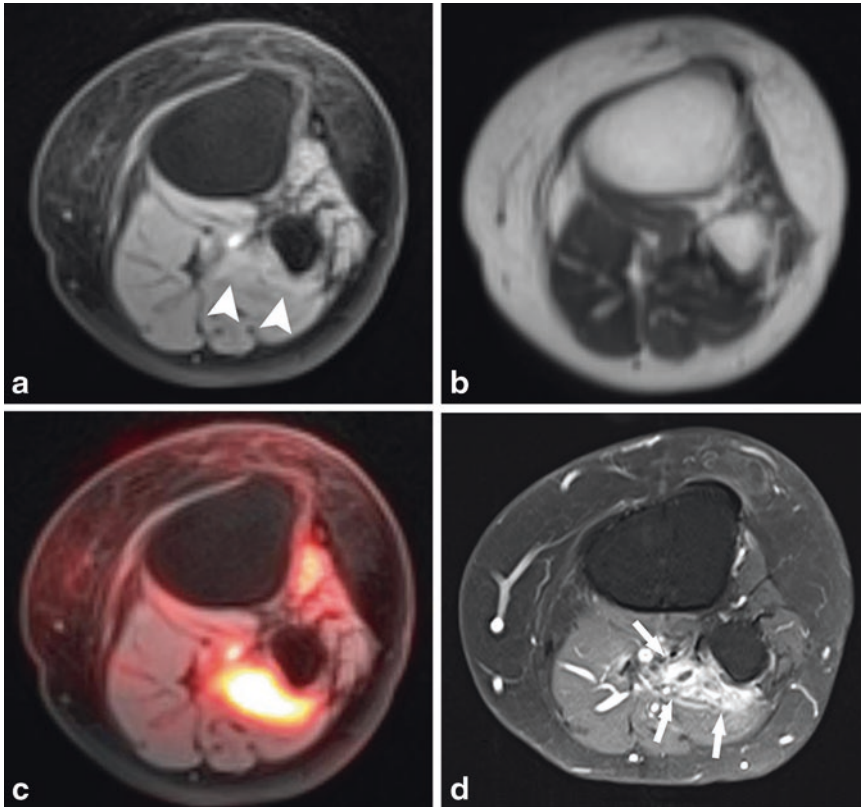


Fig. 7.1 T1 radial VIBE with fat suppression axial (a), T2 HASTE axial (b), PET/MR T1 radial VIBE with fat suppression axial fusion (c), and T1 TSE with fat suppression post-gadolinium contrast (d)

The usefulness of FDG PET in evaluation of primary and recurrent sarcomas depends on tumor grading with almost all intermediate and high-grade lesions demonstrating increased FDG activity. Low-grade tumors may have only subtle FDG uptake. This makes it difficult to differentiate low-grade myxofibrosarcomas from other benign lesions. The myxoid component of the tumor often causes a heterogeneous pattern of FDG uptake. The combination of PET/MR is helpful in determining the extent of local infiltration, define surgical margins, and detect small satellite lesions. PET/MR is also useful in monitoring response to local and systemic therapy.

Suggested Reading

- Ioannidis JP, Lau J. 18F-FDG PET for the diagnosis and grading of soft-tissue sarcoma: a meta-analysis. *J Nucl Med.* 2003;44:717–24.
- Kaya M, Wada T, Nagoya S, Sasaki M, Matsumura T, Yamaguchi T, et al. MRI and histological evaluation of the infiltrative growth pattern of myxofibrosarcoma. *Skelet Radiol.* 2008;37:1085–90.
- Kikuta K, Kubota D, Yoshida A, Morioka H, Toyama Y, Chuuman H, et al. An analysis of factors related to the tail-like pattern of myxofibrosarcoma seen on MRI. *Skelet Radiol.* 2015;44:55–62.