Case Report

Fluorine-18 fluorodeoxyglucose positron emission tomography-computed tomography in evaluation of residual intramuscular myxoma

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ABSTRACT

Intramuscular myxoma (IM) is a rare benign neoplasm. In a patient diagnosed with IM of left thigh, we report the utility of a postoperative fluorine-18 fluorodeoxyglucose positron emission tomography-computed tomography scan in assessing the efficacy of surgical excision.

Keywords: Fluorine-18 fluorodeoxyglucose, intramuscular myxoma, positron emission tomography-computed tomography scan

INTRODUCTION

Fluorine-18 fluorodeoxyglucose positron emission tomography-computed tomography (F-18 FDG PET-CT) has evolved as an imaging modality of choice for staging, restaging, treatment response evaluation and surveillance of various cancers. Increased FDG uptake is also noted in various benign conditions. Intramuscular myxoma (IM) is one such entity. Complete surgical excision is the treatment of choice with excellent prognosis. No recurrence is reported when the surgical excision is complete. However, recurrence has been documented in cases of incomplete surgical excision. We report a case where F-18 FDG PET-CT scan demonstrated residual disease in an operated case of IM.

CASE REPORT

A 36-year-old male presented with slow growing painless lump in the left thigh. There was no history of trauma, fever, or weight loss. Other medical and family history was unremarkable.

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Magnetic resonance imaging (MRI) of the thigh demonstrated a well-defined soft tissue lesion in the left rectus femoris muscle with homogenous low-signal intensity on T1-weighted sequences and markedly high signal intensity on T2-weighted sequences. Contrast-enhanced T1-weighted MRIs showed heterogeneous enhancement throughout the mass [Figure 1]. The differential diagnosis based on imaging findings was IM and myxoid liposarcoma. Excision of the mass was performed and on histopathological examination the tumor showed composition of spindle and stellate shaped cells that were widely separated by myxoid stroma. No pleomorphism, atypia, mitotic figures or necrosis was noted. The tumor cells were immunohistochemically positive for vimentin and CD34, but negative for S-100 and desmin. These findings were consistent with IM.[1] However, the cut margins were not free and the patient was referred 10 weeks later for F-18 FDG PET-CT scan for the assessment of residual disease. Increased F-18-FDG uptake was noted in the peripheral rim of a well-circumscribed centrally hypodense soft tissue lesion with thin septation in the left rectus femoris muscle [Figure 2]. The maximum standardized uptake value (SUVmax) of the lesion was 3.2 g/ml. These findings were suggestive of residual IM and the same was confirmed on histopathological examination of the postexcision specimen.

DISCUSSION

Intramuscular myxoma's are rare benign myxoid tumors. Most of them appear in the fourth to sixth decades of life with a slight female

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preponderance.[2] IM's usually arise from large skeletal muscles, the commonest location being the lower extremities, particularly the thigh (51%), followed by the gluteal region (7%). The symptoms depend on the site and size of the mass lesion. Although majority of the patients were asymptomatic and diagnosed incidentally, few present with slow growing, painless intramuscular tumor. Occasionally, the symptoms of nerve root compression may be noted. IM usually occurs as an isolated lesion, but sometimes it is associated with skeletal fibrous dysplasia, when it is known as Mazabraud's syndrome. In such cases, IM tends to be multifocal.[3]

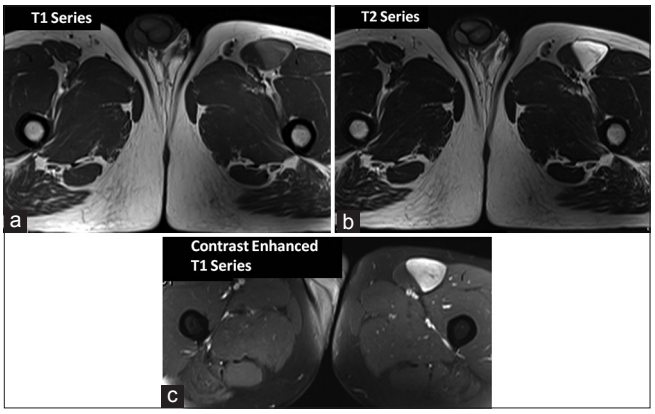

Figure 1: Magnetic resonance imaging (MRI) of the thigh demonstrated a well-defined soft tissue lesion in the left rectus femoris muscle with homogenous low signal intensity on T1-weighted sequences (a) and markedly high signal intensity on T2-weighted sequences (b). Contrast-enhanced MRIs showed heterogeneous enhancement throughout the mass (c)

Preoperatively, it is difficult to differentiate IM from other malignant myxoid tumors such as myxoid liposarcoma, low-grade fibromyxoid sarcoma, myxoid malignant fibrous histiocytoma and extra skeletal myxoid chondrosarcoma. On imaging, IM appears as hypoechoic mass on ultrasound, shows low attenuation on CT, low-signal intensity on T1-weighted MRIs, and markedly high signal intensity on T2-weighted MRIs. Contrast-enhanced imaging (particularly MRIs) more accurately reflects the truly solid (although usually hypocellular) consistency of the IM because it shows internal enhancement.

Several studies have been performed to evaluate the role of F-18 FDG PET-CT scan to differentiate benign and malignant myxoid neoplasms. However, the results were not encouraging.[4,5] The definite diagnosis of IM can only be made from the histopathological examination after its surgical excision, which is considered to be the treatment of choice. Complete resection is associated with excellent prognosis and no local recurrence generally occurs during an average follow-up of 7 years after excision. However, incomplete resection is associated with recurrence and completeness of surgery is the most important determinant of the overall outcome of the disease.[6]

There are four case reports demonstrating F-18-FDG uptake in IM.[7-10] IM shows low-grade F-18 FDG uptake with SUV values between 1.3 and 2.6. Furthermore, whole body F-18 FDG PET-CT has been reported to be useful to detect fibrosis dysplasia and single or multiple IM's in Mazabraud's syndrome.

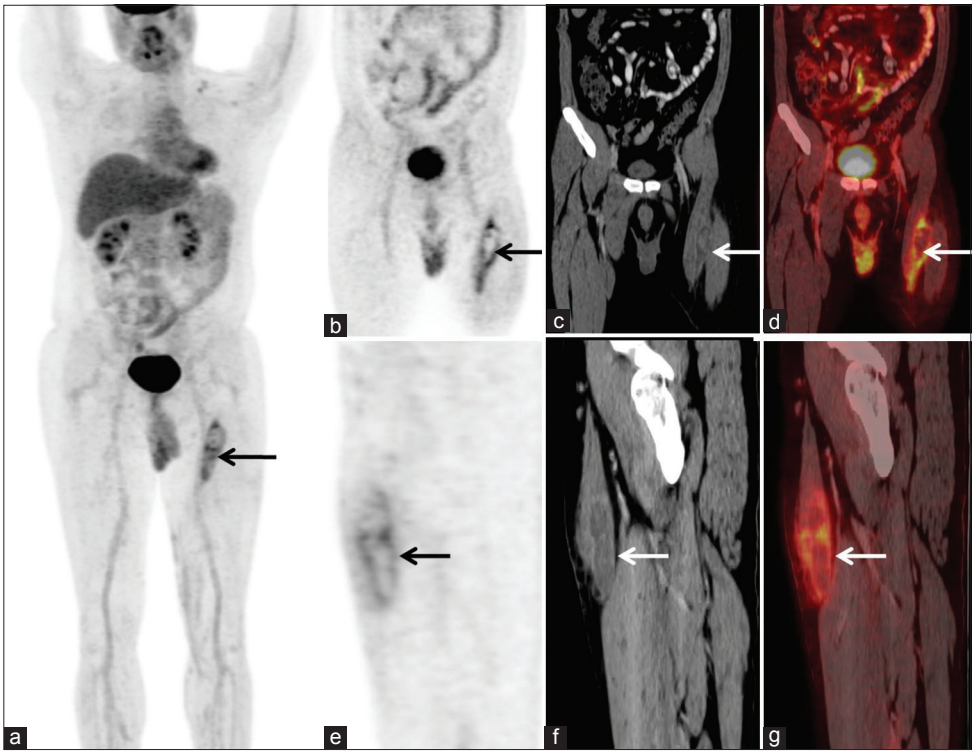

Figure 2: Increased fluorodeoxyglucose uptake was noted in the left upper thigh on maximum intensity projected (a), coronal positron emission tomography (PET) (b) and sagittal PET (e) images. This uptake corresponds to the peripheral rim of a well circumscribed centrally hypodense soft tissue lesion with thin septation in the left rectus femoris muscle on correlative coronal and sagittal computed tomography (CT) images (c and f) and PET-CT images (d and g), respectively

However, its role in assessing postoperative residual IM is not described in the literature to the best of our knowledge. This case demonstrates the possible role of F-18 FDG PET-CT scan to detect postoperative residual IM.

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