

False Negative ^{18}F -fluorodeoxyglucose Positron Emission Tomography/Computed Tomography in Primary B-cell Lymphoma of the Bone

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Abstract

We present a case of a 15-year-old male with primary bone lymphoma who was initially referred for suspicion of chronic osteomyelitis of the mandible. A bone scan and gallium scan demonstrated congruent uptake in the mandible, suggestive of chronic osteomyelitis. A biopsy subsequently showed B-cell lymphoma of the bone with low Ki-67. A fluorodeoxyglucose positron emission tomography (FDG-PET) scan performed before therapy for staging revealed no increased uptake in the mandible. This case shows an atypical presentation of a rare disorder and is presented to emphasize the importance of baseline FDG-PET.

Keywords: Fluorodeoxyglucose positron emission tomography/computed tomography, Ki-67, primary bone lymphoma

Introduction

A 15-year-old male with a remote history of oral abscess treated with antibiotics was investigated for persistent palpable soft tissue mass. A computed tomography scan of the neck [Figure 1] revealed a lytic lesion with adjacent sclerosis and periosteal reaction in the right mandible. In the clinical context, this finding was considered suspicious for chronic osteomyelitis. Subsequently, the patient underwent bone and gallium scintigraphy [Figure 2] to exclude osteomyelitis. Blood flow images demonstrated hyperemia in the right mandible, with corresponding increased uptake on delayed bone scan images. Gallium scintigraphy demonstrated congruent uptake. In the clinical setting, these findings were deemed

suspicious for chronic osteomyelitis. Because of the unusual presentation and persistent palpable lesion, a biopsy of the right mandibular lesion was obtained. Histopathological evaluation of the sample showed B-cell proliferation suspicious for lymphoma. Ki-67 staining, a marker of cellular proliferation, showed a low proliferation rate below 10%. The cells also expressed CD10, CD20, and CD79A. These findings are compatible with a non-Hodgkin B-cell primary lymphoma of the bone (PLB). Fluorodeoxyglucose positron emission tomography (FDG-PET) [Figure 3] performed before therapy to assess disease extension was entirely normal.

Discussion

PLB is a rare form of extranodal lymphoma that usually arises from the medullary cavity at a single bone site and

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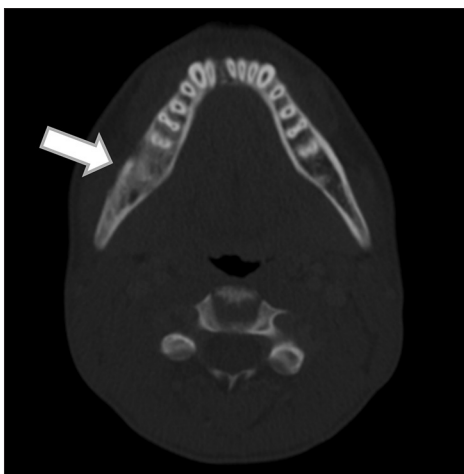


Figure 1: Computed tomography scan of the neck showing a lytic lesion with adjacent sclerosis and periosteal reaction in the right mandible (arrow)

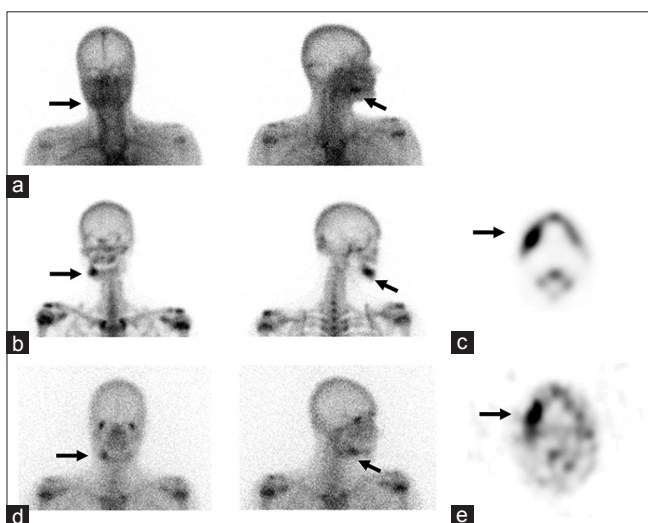


Figure 2: Bone scan blood flow images (a) and delayed planar (b) and single photon emission computed tomography (c) images demonstrate increased uptake in the right mandible (arrow). Gallium planar (d) and single photon emission computed tomography (e) images demonstrate congruent uptake (arrow)

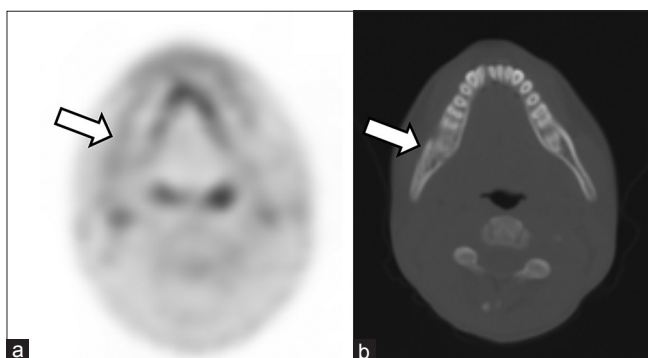


Figure 3: Selected fluorodeoxyglucose positron emission tomography (a) and corresponding computed tomography axial image (b) performed before therapy to assess disease extension shows no abnormal uptake corresponding to the osseous lesion (arrow). The rest of the fluorodeoxyglucose positron emission tomography scan was unremarkable (not shown)

affects adults older than 45 years.^[1,2] Although extremely infrequent, PLB has been described in the pediatric population.^[3,4] PLB is typically found in long bones with the diaphysis of the femur being the most frequently affected site.^[5] PLB lesions are known to show increased uptake on bone scintigraphy and FDG-PET.^[6]

FDG avidity is correlated with tumor proliferation marker Ki-67 in lymphoma and several other cancers.^[7] On histopathological examination of the lesion, the Ki-67 index was below 10%. In this case, both the bone scintigraphy and gallium scan were positive whereas the FDG-PET scan was negative. We hypothesize that the low FDG avidity of the lesion is related to the low proliferation rate of the tumor while the gallium and bone scans were positive due to bone reaction.

Conclusion

In addition of showing an unusual presentation of a rare disease, this case report reinforces the importance of obtaining a baseline study in patients with lymphoma. Indeed, a baseline FDG scan before therapy allows assessment of response to treatment.^[8,9] If no baseline studies are available for comparison, the pathology reports should be reviewed to obtain additional understanding of the nature of the malignant process being investigated.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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