

# <sup>18</sup>F-FDG PET/CT imaging for a solitary primary bone lymphoma of the maxilla

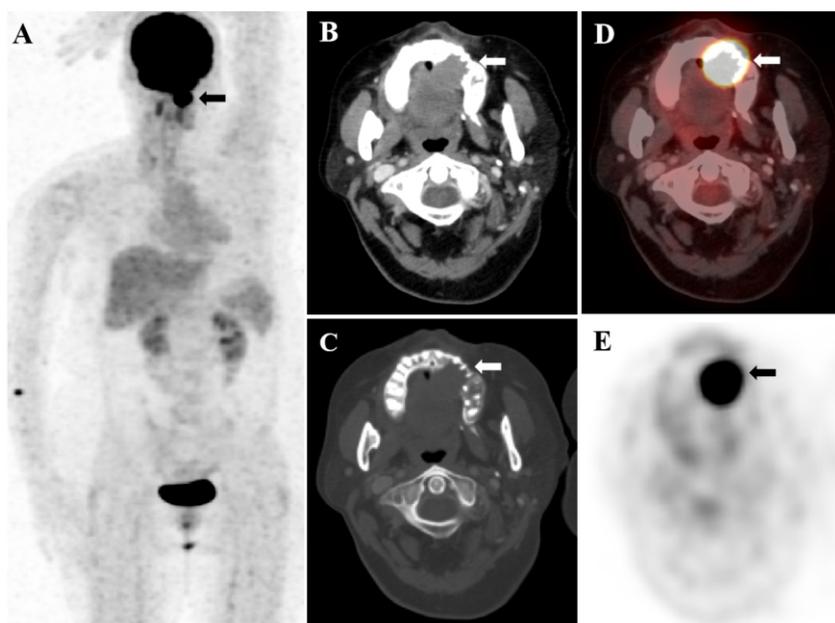
## Abstract

Primary bone lymphoma (PBL) is a rare primary extranodal lymphoma. It can occur in many parts of the body but rarely in the maxilla. We describe a case of fluorine-18-fluorodeoxyglucose positron emission tomography/computed tomography (<sup>18</sup>F-FDG PET/CT) imaging revealed solitary osseous lytic lesion with intense uptake in the maxilla, suggesting a primary skeletal malignancy. The subsequent histopathologic examination confirmed the diagnosis of high-grade B-cell lymphoma (HGBL).

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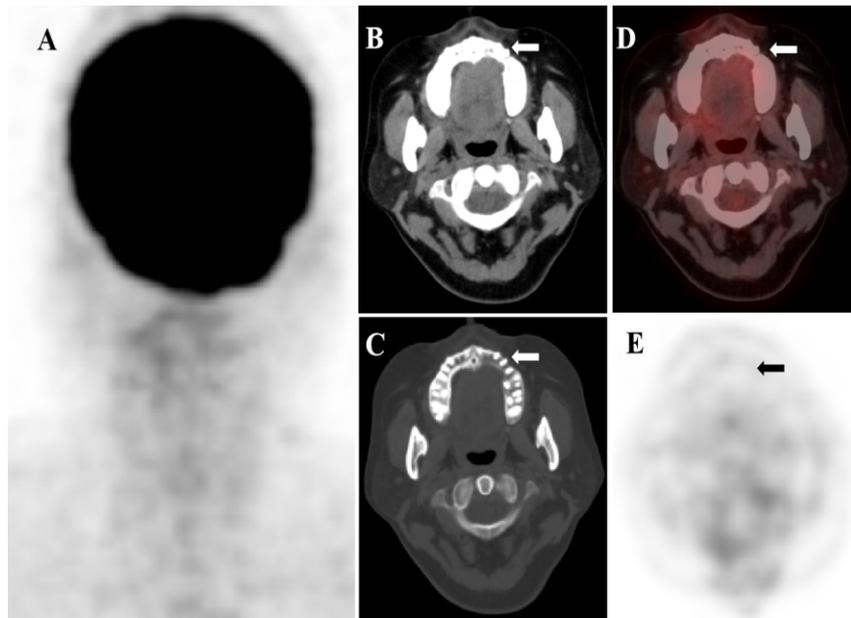


**Figure 1.** Fluorine-18-FDG PET/CT imaging of maxillary lesion. Maximum intensity projection (MIP) (A), axial contrast enhanced CT imaging on soft tissue window (B), bone window (C), PET/CT fusion imaging (D) and PET imaging (E) revealed a solitary lesion in the maxilla with increased <sup>18</sup>F-FDG uptake.

A 53-year-old woman was admitted to our department with a 3-month history of toothache on the left side of the maxilla. The treatment of anti-inflammatory drugs was ineffective. Computed tomography scan on the local hospital showed a mass of the maxilla, which suggested likely malignancy. Then, <sup>18</sup>F-FDG PET/CT (Figure 1) was performed for staging. The maximum intensity projection (MIP) image revealed no abnormal <sup>18</sup>F-FDG uptake in other regions except the left maxilla (A: arrow). Axial contrast CT images displayed with soft tissue (B) and bone windows (C) showed the destruction of the left maxillary bone (arrows) with swelling soft tissue surrounding. The lesion had moderate enhancement and invaded the hard palate and the bottom of the left maxillary sinus. The maximum standardized uptake value (SUVmax) was 23.16 on axial PET/CT fusion (D) and PET images (E). The patient eventually underwent biopsy. The findings of histopathological and immunohistochemical analysis established a diagnosis of high-grade B-cell lymphoma (HGBL). It should be noted that the focal <sup>18</sup>F-FDG uptake at the right elbow was due to radiotracer injection.

After three cycles of chemotherapy, a second PET/CT (Figure 2) was performed to evaluate the therapeutic response. No abnormal <sup>18</sup>F-FDG uptake was observed on the MIP imaging of the head and neck (A). The maxillary lesion (arrows) got remission on axial CT (B, soft tissue window; C, bone window), with a SUVmax of 2.05 on axial PET/CT fusion (D) and PET images (E). The <sup>18</sup>F-FDG uptake level in the lesion site was the same as that of the mediastinum in the scan field, which met the complete metabolic response criteria based on Lugano classification [1].

Primary bone lymphoma is a rare primary extranodal lymphoma, accounting for about 1% of all malignant lymphoma and 3% of all malignant bone tumors, which may occur in many parts of the body [2]. It is commonly found in the appendicular skeleton, with single or multiple bone involvement. This tumor is rarely in the maxilla [3]. The clinical manifestation and radiographic features of PBL are non-specific. Primary bone lymphoma without classic nodal lesions or advanced disease may be mistaken for other skeletal disorders, especially when involving a single bone site [4]. Lytic lesions in the jaw-bone reported with PET/CT ima-



**Figure 2.** Positron emission tomography/CT imaging after three cycles of chemotherapy. Positron emission tomography/CT imaging after chemotherapy showed there is no obvious tumor lesion on MIP imaging (A), soft tissue window (B) and bone window (C) in axial CT, PET/CT fusion imaging (D) and PET imaging (E), respectively.

ging including, dentigerous cyst, [5] epithelioid osteoblastoma, [6] ameloblastoma, [7] solitary plasmacytoma [8] and osteoblastoma, [9] ameloblastic carcinoma [10] and squamous cell carcinoma [5]. Ameloblastic carcinoma and squamous cell carcinoma can have very high  $^{18}\text{F}$ -FDG uptake, while others often have a background or mild to moderate  $^{18}\text{F}$ -FDG uptake. Primary bone lymphoma can accumulate  $^{18}\text{F}$ -FDG intensively, with SUVmax of  $15.14 \pm 11.82$  [2]. In the case of maxilla with very high  $^{18}\text{F}$ -FDG uptake, it is necessary to take the FNAB first since there is a possibility of PBL, which is sensitive to chemotherapy [11]. Our case showed the PET/CT manifestations of the solitary PBL of maxilla, highlighting that  $^{18}\text{F}$ -FDG PET/CT is helpful in narrowing the differential diagnosis spectrum, staging and evaluating treatment response of primary bone lymphoma of the maxilla.

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