

Eosinophilic abscess of rib on ^{18}F -FDG PET/CT: A mimic of bone tumor

Abstract

A 45-year-old man had right chest and back pain for 15⁺ days without any cause, each lasting 3-10 minutes, and sometimes it could radiate to the right shoulder. Chest computed tomography (CT) scan showed bony destruction in the dorsal segment of the 4th rib on the right. Metastatic disease was suspected and for this reason, fluorine-18-fluorodeoxyglucose (^{18}F -FDG) positron emission tomography (PET)/CT was performed. The images demonstrated increased ^{18}F -FDG activity in the dorsal segment of the 4th rib on the right with osteolytic bony destruction. Post-surgical pathological examination showed an eosinophilic abscess (EA).

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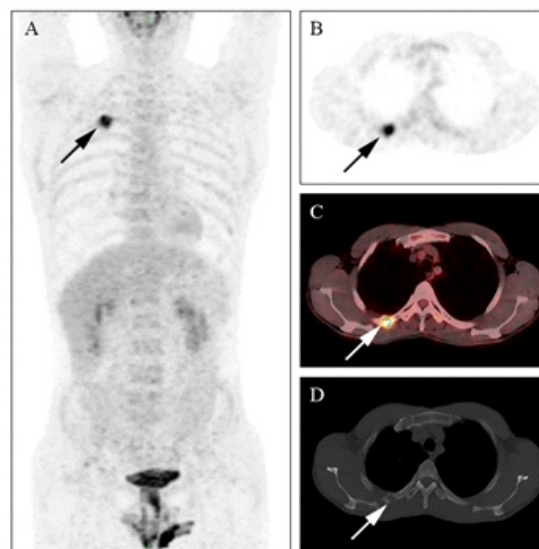


Figure 1. A 45-year-old man had been experiencing right chest and back pain for 15⁺ days, with each episode lasting 3-10 minutes and sometimes radiating to the right shoulder. On his back and chest, there was nothing felt by physical examination. Complete blood cell analysis was negative. A chest computed tomography (CT) scan was performed to look for an underlying cause. The image showed bony destruction in the dorsal segment of the 4th rib on the right. Bone tumor including metastatic disease was suspected and for this reason, fluorine-18-fluorodeoxyglucose (^{18}F -FDG) positron emission tomography (PET)/CT was performed. The maximum intensity projection (MIP) image (A) demonstrated increased activity in his right back (arrow). On the axial images, the increased activity with maximum standardized uptake value (SUVmax) of 7.5 (B, PET, arrow; C, PET/CT fusion, arrow) was at the dorsal segment of the 4th rib on the right with osteolytic bony destruction (D, CT, arrow). The findings were consistent with a hypermetabolic malignancy, likely from metastatic cancer or primary bone tumor.

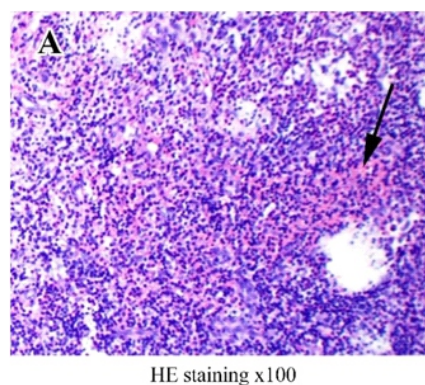


Figure 2. The bony destruction in the dorsal segment of the 4th rib on the right was subsequently resected including bone tissue, cartilage tissue, and muscle tissue. Pathological examination (A, hematoxylin-eosin stain, original magnification $\times 100$) demonstrated a large number of lymphocytes and eosinophils infiltration with granulation tissue hyperplasia, and focal eosinophilic abscess (arrow). These findings were consistent with eosinophilic abscess (EA).

The eosinophilic abscess is a rare focal disease that can be caused by parasitic infection, allergic disease, neoplastic disease, or eosinophilia syndrome and among others [1, 2]. Eosinophilic abscess mostly occurs on the body surface and inhalation ducts connected to the body surface, such as the digestive tract, respiratory tract, and liver, which is often misdiagnosed as primary or metastatic tumor [3, 4]. The occurrence of EA in the rib in this patient is extremely rare, and there are no relevant reports. The symptoms and signs of EA in different parts are related to the location of the abscess and the related diseases that cause it. According to the current literature reports on EA disease, the majority of the disease is in the liver, and the imaging findings are not specific. However, larger nodules of EA with greater attenuation differences from the background liver on portal phase CT or brighter signal intensity on T2-weighted magnetic resonance imaging (MRI) tend to show ^{18}F -FDG uptake [5]. Indeed, the pathological examination is very important for the diagnosis and differential diagnosis of EA. The histopathological manifestations of EA are: focal coagulative necrosis in the center of the lesion, accompanied by a large number of eosinophil infiltration, and other inflammatory cells (such as lymphocytes, etc.) infiltration, Charcot-Leyden crystals can be seen in some cases, which is basically consistent with our case [2, 6]. Fluorine-18-FDG PET/CT of EA showed hypermetabolic activity which may be attributed to the presence of large inflammatory cells in the lesion that can provide certain diagnostic information [7-9]. But the SUVmax may not be helpful for differential diagnosis of EA and tumors based on the available literature [10]. In summary, the diagnosis of EA should be combined with a medical history, clinical manifestations, laboratory examinations, imaging findings, and pathological examination results [11, 12]. In addition, this case illustrates that the EA of the rib can mimic bone tumor uptake on ^{18}F -FDG PET/CT which should be bear in mind by nuclear physicians.

The authors declare that they have no conflicts of interest.

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