

Submitted by: Sharjeel Usmani

Department of Nuclear Medicine HMJCSS, Kuwait.

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History

28 years old male presented with history of pain over left knee with no prior history of trauma. He was tender over left tibial tuberosity with no sign of acute inflammation. A dynamic Tc-99m MDP planar bone scan followed by SPET/CT of both lower limbs was performed.

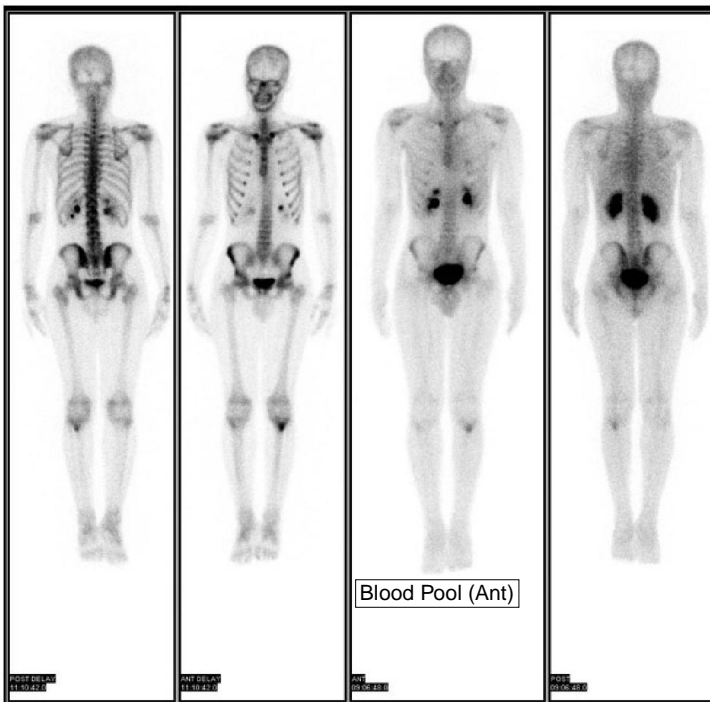


Figure 1a

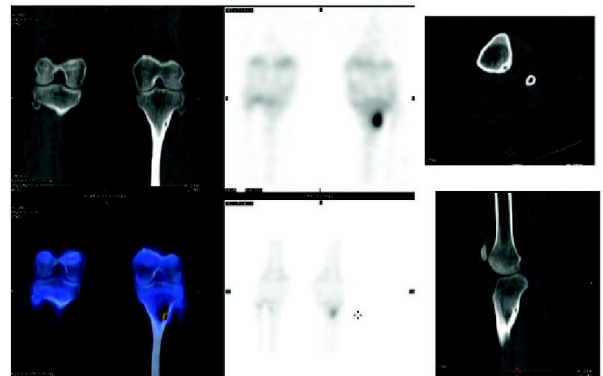


Figure 1b

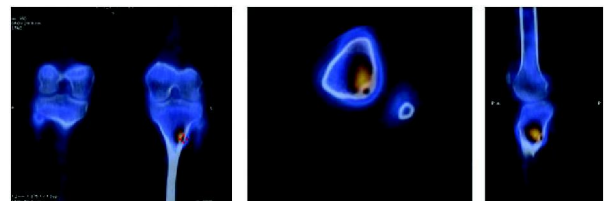


Figure 1c

Question

Q1. Describe scan findings and what is the most plausible diagnosis?

QUIZ

Answer

Fig. 1 (a-c): (a) whole body bone scan showing a focus of abnormal uptake over left tibial tuberosity region with enhanced blood pool activity as well. (b-c) multi planar SPECT/CT images showing an area of sclerosis involving the proximal lateral cortex with a central nidus convincing with high MDP uptake as well. Findings are consistent with osteoid osteoma.

Discussion

Osteoid osteoma is a relatively common bone tumor accounting for about 5% of all primary bone tumors. It most commonly involves young individuals (90% < 25 yr)¹ but may also affect people at extremes of ages with a male predilection as well. Most involves the cortex of shaft of long bones (less commonly also involves epiphyses and metaphyses) like femur, tibia and humerus. It less commonly involves spine with a reported incidence of 7-20%.² They are usually small in size <1.5-2 cm and characterized by a prominent nidus in a highly vascular connective tissue and surrounded by zone of sclerosis or normal bone.³ A deep aching pain of high intensity is the principal symptom of both initial and recurrent disease which usually worse at night (in 95% of patients) and diminishes by morning. Plain X-ray usually reveals the nidus as a radiolucent area of about 1 cm in diameter with a center that is sometimes calcified, resulting in a radiopaque point called the bell. However, during the first months after the onset of complaint, radiograph may be normal. CT scanning is the ultimate diagnostic tool for the precise localization of the nidus which shows enhancement after contrast. Three phase planar dynamic bone scan has a characteristic finding of a focus of high flow, high blood pool activity and a focus of intense tracer uptake on delayed images. Hybrid imaging like SPECT/CT using Tc-99m MDP shows an excellent diagnostic accuracy for osteoid osteoma and can be used as a one-stop imaging modality for the same. It is superior to planar bone scan and CT alone for the diagnosis of suspected osteoid osteoma.⁴ The focus was curettage and histopathology was osteoid osteoma.

References

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3. Greenspan A. Benign bone-forming lesions: osteoma, osteoid osteoma, and osteoblastoma. Clinical, imaging, pathologic, and differential considerations. *Skeletal Radiol* 1993; **22(7)**: 485-500.
4. Sharma P1, Mukherjee A, Karunanithi S, Nadarajah J, Gamanagatti S, Khan SA, Bal C, Kumar R. ^{99m}Tc-Methylene diphosphonate SPECT/CT as the one-stop imaging modality for the diagnosis of osteoid osteoma. *Nucl Med Commun.* 2014; **35(8)**: 876-83.