Cold Lesion on Bone Scan Due to Echinococcosis Alveolaris and Review of the Literature

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This case report describes a cold lesion on bone scan due to Echinococcosis alveolaris and reviews the literature about cold lesions on bone scan.

Key Words : Echinococcus alveolaris, bone scan, cold lesion

Bu vaka sunumunda kemik sintigrafisinde Echinococcosis alveolaris'e bağlı soğuk lezyon gösteren bir olgu incelenmiş ve kemik sintigrafisinde soğuk lezyonlara ait literatür gözden geçirilmiştir.

Anahtar Kelimeler : Echinococcus alveolaris, kemik sintigrafisi, soğuk lezyon

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INTRODUCTION

Bone scans are the most frequently performed scintigraphies in nuclear medicine departments. The lesions demonstrated in scintigraphy usually reflect the observation of a relatively obvious area of focally increased activity. This indicates the reparative process, visualized radiologically as sclerotic lesions. Photon deficient areas on bone scans have been reported since 1974, but these lesions are rare. We report a patient who had a bone scintigraphy that showed a photopenic lesion due to echinococcosis.

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CASE REPORT

A 28 year old male with discharge from his right knee was referred to nuclear medicine department for evaluation of suspected osteomyelitis. He had suffered a shrapnel injury to his right middle lateral thigh eight years ago. Two years after the injury he noted pain and swelling on his right thigh. Biopsy of the swelling revealed echinococcosis which was treated by drainage and irrigation with albentagol. Two months ago his complaints of pain in right thigh recurred. A Tc-99m-MDP three phase bone scintigraphy was performed. Flow (Fig 1a) and blood pool (Fig 1b) images showed increased uptake in the right thigh and knee. In the static phase increased accumulation was noted in the soft tissue of right femoral region. Moreover a hypoactive lesion was present in the right proximal tibia with increased uptake around this area (Fig 2). These findings were consistent with soft tissue infection in the right thigh and osteomyelitis or prosthetic joint infection affecting the right knee and proximal part of the tibia. Soft tissue infection and osteomyelitis were also confirmed by immunoscintigraphy with Tc-99m labelled human immunoglobulin (Tc-99m-HIG) (Fig 3). On CT and MR scan a cystic lesion was diagnosed in the right proximal tibia (Fig 4). Aspiration from the right thigh showed staphylo-

coccal infection. Wall fragments of Echinococcus alveolaris were found in the aspirate from the right proximal tibia. Indirect hemagglutination test and Elisa-IgG for Echinococcus alveolaris were positive beginning in 1/100 titrations. Considering the clinical and microbiologic findings this hypoactive lesion was then interpreted as a reflection of bony involvement of echinococcosis in the right proximal tibia.

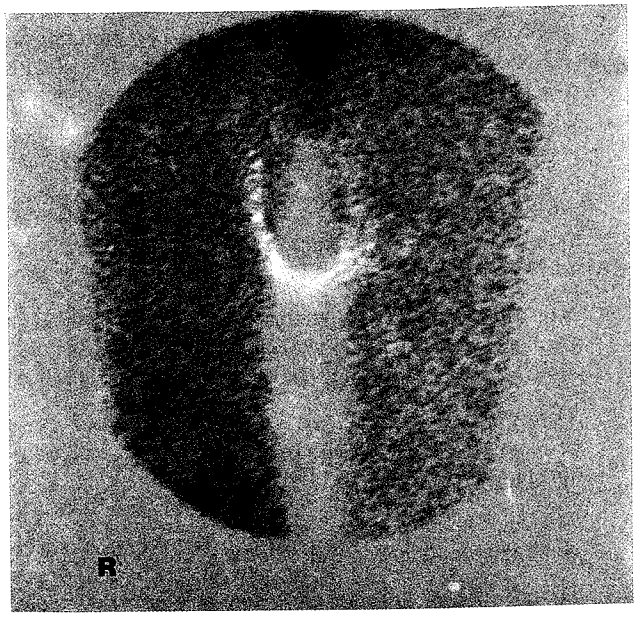

Fig. 1. A. Increased Tc-99m MDP uptake in the right thigh and knee region in flow and B. Blood pool phases.

Fig. 2. Static phase bone scan: Soft tissue uptake in right thigh and a hypoactive lesion in right proximal tibia with surronding rim of increassed accumulation.

Fig. 3. Tc-99m HIG scan: Increased tracer uptake in right thigh and proximal leg with a hypoactive region next to the right knee.

Fig. 4. Cystic lesion in the right proximal tibia on MR scan.

DISCUSSION

Photon deficient areas on bone scans are less frequent than focally increased activities. The following pathologic processes have been reported as the causes of cold lesions on bone scan.

1. Acute osteomyelitis (1)
2. Prosthetic joint infection (2)
3. Joint effusion or synovitis (3)
4. Septic arthritis (4)
5. Primary tumors (Lung, giant cell tumor) (5, 6)
6. Metastases (Follicular thyroid carcinoma, multiple myeloma, renal cell carcinoma, breast, lung, osteosarcoma) (5, 7, 8, 9, 10)
7. Traumatic (healing avascular necrosis, sickle cell disease, subperiostal hematoma, surgical defect, nonunited fractures, nonviable bone grafts (11, 12).
8. Artefacts (barium in colon, cardiac pacemaker, preosthesis)

To our knowledge photopenic lesion due to echinococcosis has not been reported. The lack of osteoblastic activity in the destroyed bone, together with diminished perfusion, causes a photopenic defect in the center of the lesion. Remodelling in the adjacent bone with increased osteoblastic activity causes a rim of increased accumulation. Hypoactive lesion in the proximal tibia with increased uptake around this hypoactive area involving the knee joint and proximal part of the tibia was first interpreted as prosthetic joint infection. Nevertheless the patient did not have any prosthesis. This case showed that Echinococcus alveolaris infestation is another cause for hypoactive lesions on bone scan.

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