

Incidental osteonecrosis in the distal left femur in a case of beta-thalassemia with COVID-19: Role of [^{99m}Tc]Tc-MDP whole-body bone scan

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Abstract

Secondary anemia in hemoglobinopathies like thalassemia can cause expansion of the bone marrow cavities because of compensatory marrow hyperplasia. This case demonstrates spontaneous osteonecrosis of the distal left femur in a patient with β -thalassemia that may be secondary to ischemic infarction secondary to occlusion of the microvasculature within the expanded cancellous bone. This subject was referred to Hazrat Rasool Akram Hospital because of fever, cough, and bone pain. In the CT scan she had scattered peripheral CGO in both lungs due to COVID-19 with two paravertebral masses due to extramedullary hematopoiesis. The patient had also generalized bone pain so the physician asked for a whole-body bone scan and incidentally, we found a cold lesion with a rim of increased uptake in the distal left femur that with bone biopsy it was consistent with osteonecrosis. This case illustrates the importance of performing a whole-body bone scan in β -thalassemia for the management of patients and diagnosis of occult osteonecrosis.

KEY words: osteonecrosis; case report; paravertebral mass; COVID-19

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Introduction

The normal ratio of alpha-globin to beta-globin production in thalassemias is disrupted due to variation in one or more of the globin genes that leads the unpaired chains to precipitate and causes destruction of red blood cell (RBC) precursors in the bone marrow (ineffective erythropoiesis) and circulation (hemolysis). So, these patients have anemia and extramedullary hematopoiesis, which could lead to bone changes, impaired growth, and iron overload [1]. Quality of life of these patients is important and complications include heart failure, chronic liver hepatitis, cirrhosis, and, rarely, in hepatocellular carcinoma, endocrine problems, stunted

growth, osteoporosis, thrombophilia, etc. [2]. Abnormal skeletal findings in whole-body bone scans occur in human hemolytic disorders associated with thromboses, such as beta-thalassemia and sickle cell disease [3]. One of the complications in beta-thalassemia is osteonecrosis. Patients may have no symptoms in the early stages of osteonecrosis. Untreated, AVN worsens with time, and bone can become weak and collapse. So early diagnosis is important [4].

Another complication is extramedullary hematopoiesis from ineffective erythropoiesis that could lead to extramedullary hematopoietic tumor formation in several parts of the body such as Paraspinal involvement that is important to diagnosis because of complications secondary to spinal cord compression [5].

Case presentation

A 38-year-old woman with fever, cough, and bone pain was referred to Hazrat Rasool Akram Hospital suspicious to COVID-19. In the computed tomography (CT) scan the patient had a 39 mm left paravertebral mass and a 30 mm right paravertebral mass in the

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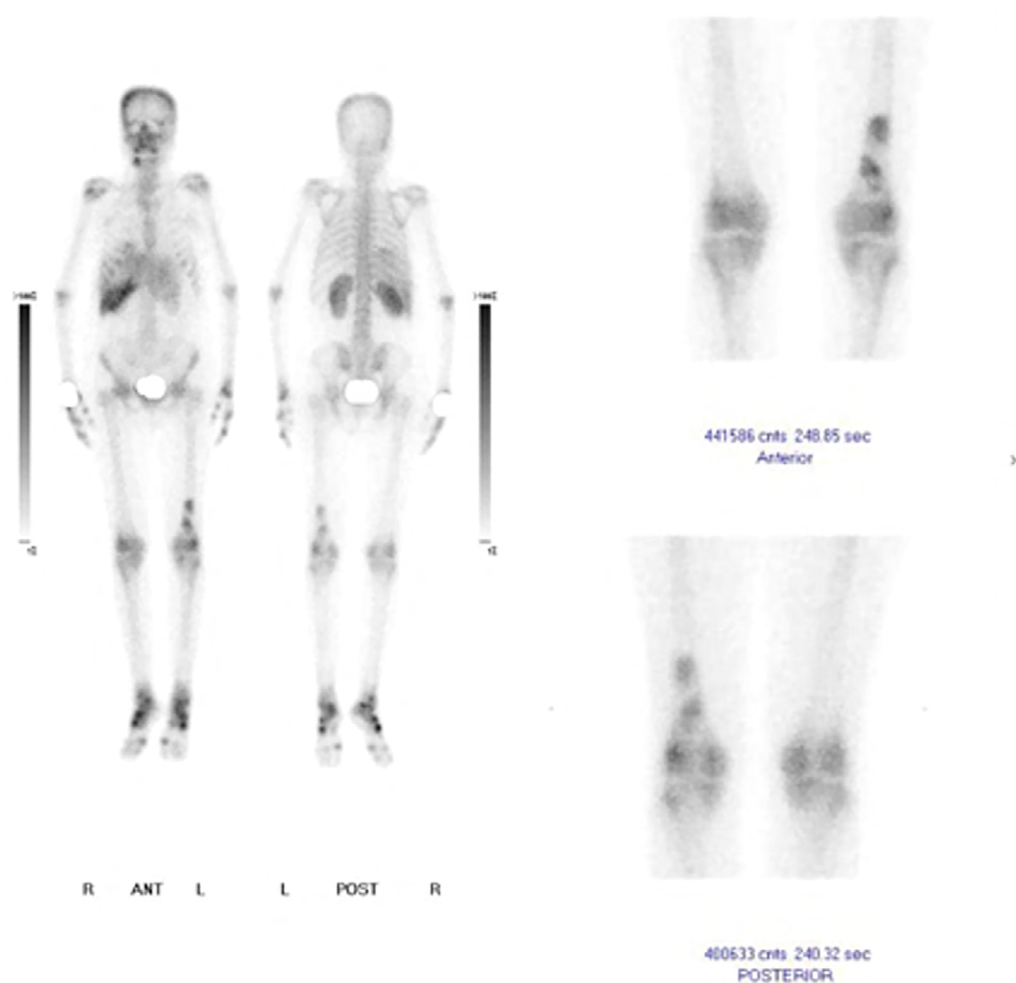


Figure 1. Whole body bone scan

lower thoracic level (Fig. 1), after taking full history the patient had beta-thalassemia with a history of multiple blood transfusions, and these masses were in favor of extramedullary hematopoiesis that proved by biopsy, the patient also had generalized bone pain, so physician referred her for ^{99m}Tc whole-body bone scan. Incidentally, we found a cold lesion with a rim of increased uptake in the distal left femur (Fig. 2) that with X-ray correlation it was a well-defined hyperdense lesion in the distal left femur with a narrow transitional zone without periosteal reaction or cortical disruption most consistent with osteonecrosis (Fig. 3) and in the biopsy, the diagnosis was proved.

In a whole-body bone scan, huge hepatomegaly with diffuse radiotracer uptake was visualized that covered the left kidney on anterior projection, and the spleen was not seen due to a previous splenectomy several years ago.

This scintigraphic finding in the liver was due to increased iron turnover and hepatitis from multiple previous blood transfusions.

Dorsal and lumbar MRI was performed because of vertebrae pain and it revealed two multilobulated masses measured 48 × 35 × 28 mm and 40 × 29 × 20 mm with heterogeneous T2 and iso T1 signal and heterogeneous enhancement in post-contrast



Figure 2. Static image



Figure 3. X-ray

images in the bilateral paravertebral region of the dorsal spine are seen that are in favor extramedullary hematopoiesis (Fig. 4).

Teaching Point

A Lung CT scan in a patient with COVID-19 could show incidental findings such as other important masses that in this patient was extramedullary hematopoiesis which is important to diagnosis because of the possibility of spinal cord compression also Whole body bone scan can find incidental extramedullary hematopoiesis, osteonecrosis and hepatic involvement in beta-thalassemia patients and can apply as routine imaging for the diagnosis of complications of beta-thalassemia and improve quality of life of these patients.

Conflicts of interest

The authors declare no conflict of interest.

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Figure 4. Magnetic resonance imaging (MRI)

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