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The Role of Bone Scintigraphy in Detection of Disseminated Coccidioides Fungemia

Dissemine Coccidioidies Fungemisinin Saptanmasında Kemik Sintigrafisinin Rolü

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Abstract

Although extrapulmonary Coccidioides infection is rare, it has been shown to disseminate to the skin and musculoskeletal system, with a strong affinity for bone. We present a case of disseminated Coccidioides infection with bone scintigraphy indicating diffuse fungemia despite equivocal serum assay, leading to appropriate antifungal therapy and a full recovery.

Keywords: Mycoses, scintigraphy, Coccidioides

Öz

Akciğer dışı Coccidioidies enfeksiyonu nadir görülse de, kemiğe güçlü afinitesi ile deri ve kas-iskelet sistemine yayılabilir. Uygun antifungal tedavi ve tam iyileşme ile sonuçlanan, serum testi belirsiz olmasına rağmen kemik sintigrafisinde dissemine fungemi gösteren ve yaygın Coccidioidies enfeksiyonu olan bir olgu sunulmuştur.

Anahtar kelimeler: Mikozlar, sintigrafi, Coccidioides

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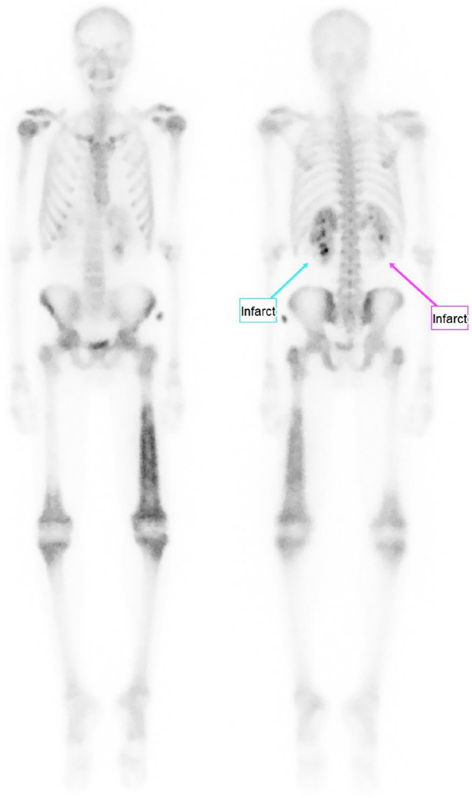

Figure 1. A 20-year-old male who had recently emigrated from Venezuela presented to the emergency department with five days of fever, lower abdominal pain, and diarrhea. In triage, he was febrile at 103 degrees, tachycardic at 130 beats per minute, and had scleral icterus. Initial laboratory tests revealed leukocytosis, anemia, thrombocytopenia, elevated bilirubin, and elevated liver enzymes. Initial labs indicated possible *Klebsiella* bacteremia. The patient was started on broad-spectrum antibiotics, but his fever did not resolve.

Infectious disease ordered additional lab work, which revealed positive Coccidioides immunoglobulin G; however, repeat confirmatory testing was negative. Given negative confirmatory tests, a bone scan was ordered for further evaluation; as Coccidioides has high affinity for bone (1,2,3).

Technetium-99m (Tc-99m) methylene diphosphonate (MDP) bone scan showed abnormal radiotracer activity seen in the left femur, bilateral knee joints, distal femurs, proximal tibias, bilateral humeral heads, and bilateral femoral heads. This is concerning for osseous coccidiomycosis with known proclivity for osteoarticular joints (3,4). While osteoarticular Tc-99m MDP uptake is symmetric in the appendicular skeleton, left femoral uptake is very prominent along the left femoral shaft. Bone scintigraphy also showed areas of decreased uptake in bilateral renal cortices, suggestive of infarcts related to septic emboli. Overall, the patient was diagnosed with presumed osseous Coccidioidomycosis after a bone scan. The patient's condition improved after antifungal therapy, leading to a full recovery at the time of discharge.

Although bone scintigraphy is not commonly used to detect fungemia, it can serve as an adjunct imaging modality in cases of equivocal serum assay, as certain species (i.e., Coccidioides) can cause osteoarticular Tc-99m MDP uptake (5). This case depicts the role of bone scintigraphy in disseminated fungemia, especially for the Coccidioides species, and can aid in diagnosis when there is an equivocal serum antibody assay.

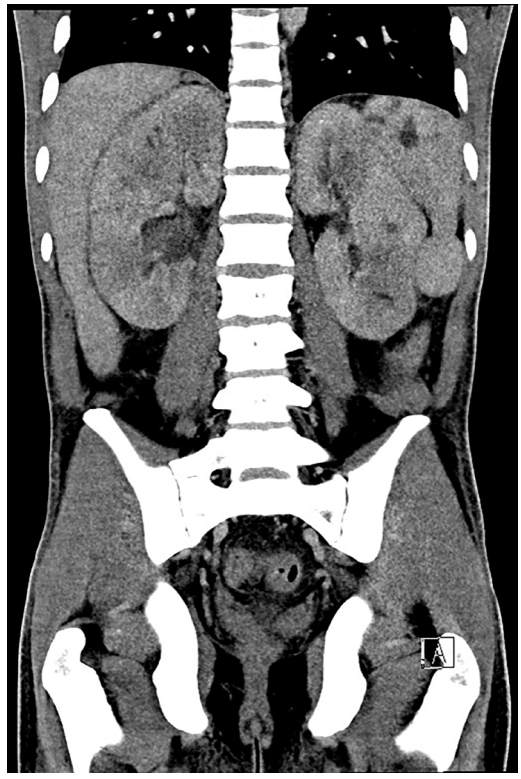

Figure 2. (A) A contrast enhanced computed tomography abdomen was ordered revealing wedge-shaped regions of hypoattenuation in the spleen and kidneys matching the pattern seen on bone scintigraphy, confirming renal changes seen on bone scintigraphy and indicating septic emboli.

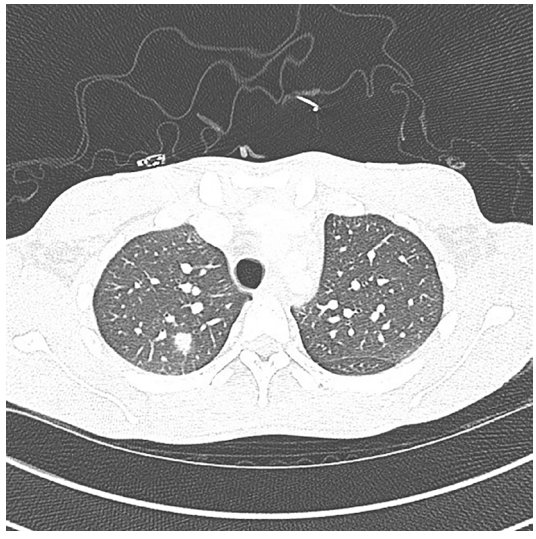

Figure 3. A chest computed tomography (CT) was also obtained, which showed scattered pulmonary nodules with surrounding ground glass halos, suggestive of fungal infection.

Given bone scintigraphy and CT scan findings of diffuse fungal infection, the patient was started on itraconazole, which was later switched to fluconazole due to cost.

Ethics

Informed Consent: Our institutional IRB protocol doesn't require documentation of consent for case studies which don't involve protected health data/patient identifiers.

Footnotes

Authorship Contributions

Concept: T.B.C., Design: T.B.C., C.W., Data Collection or Processing: T.B.C., C.W., Analysis or Interpretation: T.B.C., C.W., Literature Search: T.B.C., C.W., Writing: T.B.C., C.W.

Conflict of Interest: No conflicts of interest were declared by the authors.

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