

Case Report

Splenic Absorption of Radiopharmaceutical in Systemic Bone Scans Performed after Liver Transplantation

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ABSTRACT

A technetium-labeled phosphate bone scan was found to detect bone fractures and bone metastasis in the early stages compared to general radiographs. Therefore, bone scans are among the most frequently performed nuclear medical imaging examinations. However, non-osseous radiopharmaceutical uptake on bone scans is unusual. Herein, we report a case of diffuse splenic absorption of Tc-99m dicarboxypropane diphosphonate in patients who underwent liver transplantation.

Key words: Tc-99m Dicarboxypropane Diphosphonate, Bone Scan, Splenic Absorption, Liver Transplantation

INTRODUCTION

Bone scans using technetium-labeled phosphate were found to detect bone fractures and metastasis in the early stages compared to general radiographs [1]. Therefore, bone scan is a commonly used modality for the evaluation of musculoskeletal lesions [2]. However, non-osseous radiopharmaceutical uptake on bone scans is often unexpected. Here, we report a case of diffuse splenic uptake of Tc-99 m dicarboxypropane diphosphonate (DPD), which resembles a nuclear medicine spleen scan.

CASE PRESENTATION

A 47-year-old female presented with a history of alcoholic liver cirrhosis and splenomegaly underwent liver transplantation. The patient complain of lower backache and whole skeletal pain; a bone scan was performed to evaluate generalized osseous pain. A after 3h of intravenous injection oh 925 MBq Tc-99m DPD, whole-body images were recorded using a low-energy high-resolution collimator with a dual-head gamma camera (Symbia E, Siemens, USA)(Fig. 1).

Bone scan images showed an increased diffuse splenic absorption of Tc-99 m DPD (Fig. 2a). Contrast-enhanced computed tomography (CT) was performed. In this study, we performed contrast-enhanced CT, which revealed multiple poorly marginated, hypo-enhancing splenic lesions corresponding to infarction in the arterial and portal venous phases (Fig. 2b).

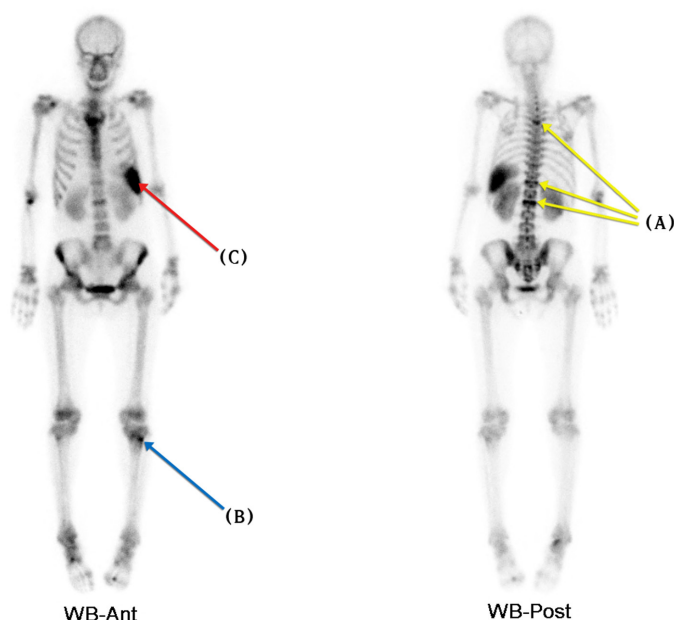


Fig. 1. Bone scan images show increased abnormal osseous uptake (A) on T4, T12, and L2 levels (compression fractures) and (B) left proximal tibia (suggestive traumatic bone lesion). Furthermore, they show increased (C) diffuse splenic uptake of radiopharmaceutical resembling nuclear medicine spleen scan.

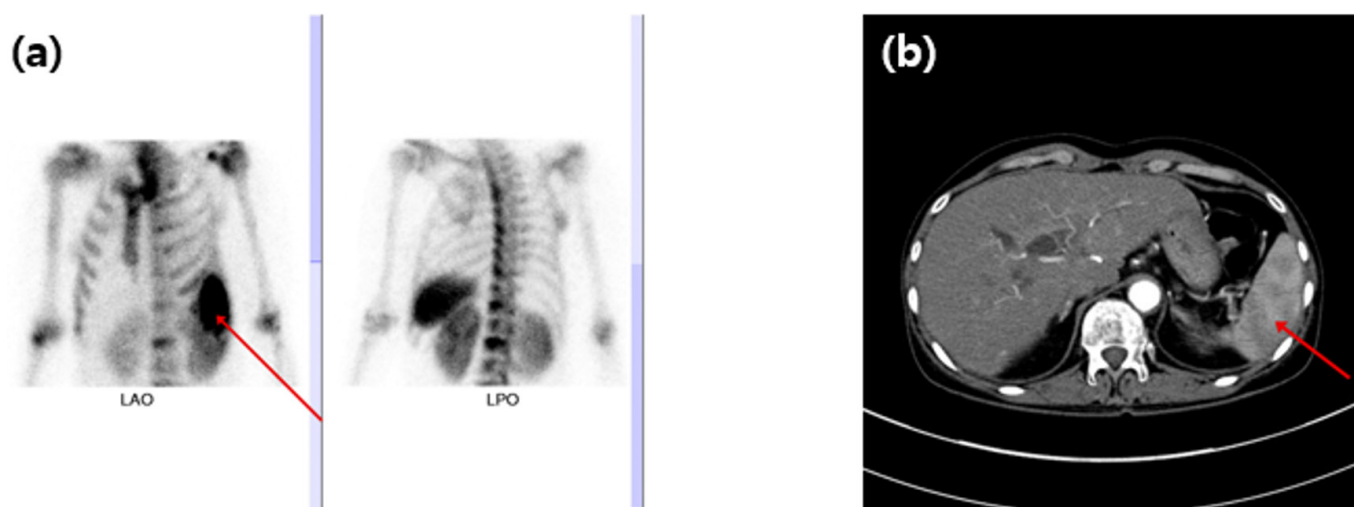


Fig. 2. Diffuse splenic uptake Tc-99 m DPD bone scan imaging (a) and contrast-enhanced CT imaging (b) findings were consistent with splenic infarction. Correlative contrast-enhanced computed tomography images are located on the bone scan images, with spleen infarction lesions marked by an arrow.

DISCUSSION

Bone scan images showed increased radiopharmaceutical absorption in lesions with increased osteoblastic activity. Table 1 lists common clinical indications for bone scans [1].

Unexpected radiopharmaceutical uptake in the spleen is occasionally observed during bone scans. The mechanism of splenic uptake of bone-seeking radiopharmaceuticals has been associated with the following finding [3-12]: residual radioactivity from a previous colloid scan,

misadministration of radiocolloid, excessive aluminum ions from the generator, excessive serum aluminum, injection of radioiodinated contrast medium following bone agent injection, unknown metastatic calcification, hepatic necrosis, conditions of iron therapy, and compartmental sequestration. In this case, we can explain as splenic uptake of Tc-99 m DPD was caused by multiple poorly marginated hypo-enhancing splenic lesions corresponding to the infarction.

Table 1. Common Clinical Indications

Skeletal metastatic disease and staging (e.g., neuroblastoma or cancers of the prostate, breast, lung, or kidney)

- Primary bone tumors (benign and malignant)
- Occult or stress fractures and shin splints
- Osteomyelitis
- Avascular necrosis
- Arthritides
- Complex regional pain syndrome (formerly called reflex sympathetic dystrophy)
- Bone infarction
- Bone pain that is otherwise unexplained
- Accidental and nonaccidental trauma
- Further evaluation of skeletal abnormalities incidentally found on other types of imaging studies
- Prosthetic hardware complications
- Heterotopic ossification
- Paget disease
- Fibrous dysplasia
- Hypertrophic osteoarthropathy
- Bone manifestations of sickle cell disease
- Temporomandibular joint disorders

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