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

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Abstract
Technetium-labeled phosphate bone scan was shown to detect bone fractures and bone metastasis in early stage than general radiographs. Therefore, bone scan has become one of the most frequently performed nuclear medicine imaging examination. However, non-osseous radiopharmaceutical uptake on the bone scan are unusual findings. We report a case of diffuse splenic absorption of Tc-99m dicarboxypropane diphosphonate in patients who undergo liver transplantation.

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

Introduction

Bone scan using technetium-labeled phosphate was shown to detect bone fractures and bone metastasis in early stage than general radiographs[1]. Therefore, bone scan is a commonly used modality in the evaluation of musculoskeletal lesions[2]. However, non-osseous radiopharmaceutical uptake on the bone scan are often an unexpected findings. In this case report, we report a case of diffuse splenic uptake of Tc-99m dicarboxypropane diphosphonate (DPD) resembling nuclear medicine spleen scan.

Case Presentation

A 47-year-old female presented with a history of alcoholic liver cirrhosis and splenomegaly who received liver transplantation and embolization of splenic artery. The patient was complaining of lower backache and whole skeletal pain so that bone scan were performed for evaluation of generalized osseous pain. Three hours after the 925 MBq Tc-99m DPD intravenous injection, whole body images were recorded using low energy high resolution collimator of the dual-head gamma camera (Symbia E, Siemens, USA)(Fig. 1).

Fig. 1. Bone scan images show increased abnormal osseous uptake (a) on T4, T12, L2 level (compression fractures) and (b) left proximal tibia (suggestive traumatic bone lesion). Furthermore, show increased (c) diffuse splenic uptake of radiopharmaceutical resembling nuclear medicine spleen scan.
Bone scan images show increased diffuse splenic absorption of Tc-99m DPD (Fig. 2-a). Therefore, the contrast enhanced computed tomography (CT) was performed for the patient. In this study, we showed the contrast enhanced CT which was multiple poorly marginated hypo-enhancing splenic lesions corresponding to the infarction in the arterial and portal venous phase, as show in Fig. 2-b.

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

An unexpected radiopharmaceutical uptake in spleen is occasionally found in the performance of bone scan. The mechanism for spleen uptake of bone-seeking radiopharmaceuticals has been associated with the following finding [3-12]: residual radioactivity from previous colloid scan, misadministration of radiocolloid, excessive aluminum ion from 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 expected to explain our findings as spleen uptake of Tc-99m DPD caused by multiple poorly marginated hypo-enhancing splenic lesions corresponding to the infarction and improves the diagnostic value.

Discussion

Bone scan images show increased radiopharmaceutical absorption in lesions with increased osteoblastic activity. Table 1 lists reported common clinical indications for bone scan include.[1].
REFERENCES