

## 골격외 종양 환자에서 냉소 골전이와 유사하게 보인 잔류 바륨에 의한 광자 결손

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### Photon Defects due to Residual Barium in the Colon Simulating Cold Bone Metastasis in Two Patients with Extraskkeletal Cancer

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#### Abstract

One of common causes of cold defects on bone scintigraphy is an attenuation artifact. Cold defects can be produced by belt buckles, buttons, earring, necklaces, or other metal objects. Cold lesions in the abdomen are also produced by retained barium in the gastrointestinal tract after recent barium studies. We observed artifacts due to retained barium in the colon on bone scintigraphy, which simulated cold bone metastases in two patients with extraskkeletal cancer. (**Korean J Nucl Med 2002;36:314-6**)

**Key Words:** Artifact, Barium, Tc-99m MDP, Bone scintigraphy

Attenuation artifacts are common causes of cold areas on bone scintigraphy.<sup>1,2)</sup> External attenuating structures such as jewelry (e.g., earrings, rings, and necklaces), clothing (e.g., buttons and belt buckles), or coins in pockets are frequent causes of cold defects. However, internal attenuating structures such as permanent cardiac pacemakers, radiographic contrast materials, prosthetic joints, and other orthopedic internal fixation devices are also commonly encountered. Such artifacts can be recognized by

their shape, location, and the fact that those are usually seen only on the anterior or posterior view but not on both. Most of these artifacts can be prevented by asking the patients to remove jewelry and other metal objects, and obtaining careful history.

Cold lesions in the abdomen can be produced by residual barium in the gastrointestinal tract after a recent barium studies.<sup>3,4)</sup> When it overlies and attenuates part of the bone, photon defects in the bone can be produced and simulated cold bone metastases, especially in a patient with known malignant disease. However, their characteristic curvilinear or tubular shape and location suggest an attenuation artifact produced by residual barium in the gastrointestinal tract. However, if the photon defect was not curvilinear or tubular in shape and

Received Sep. 7, 2002; accepted Sep. 7, 2002

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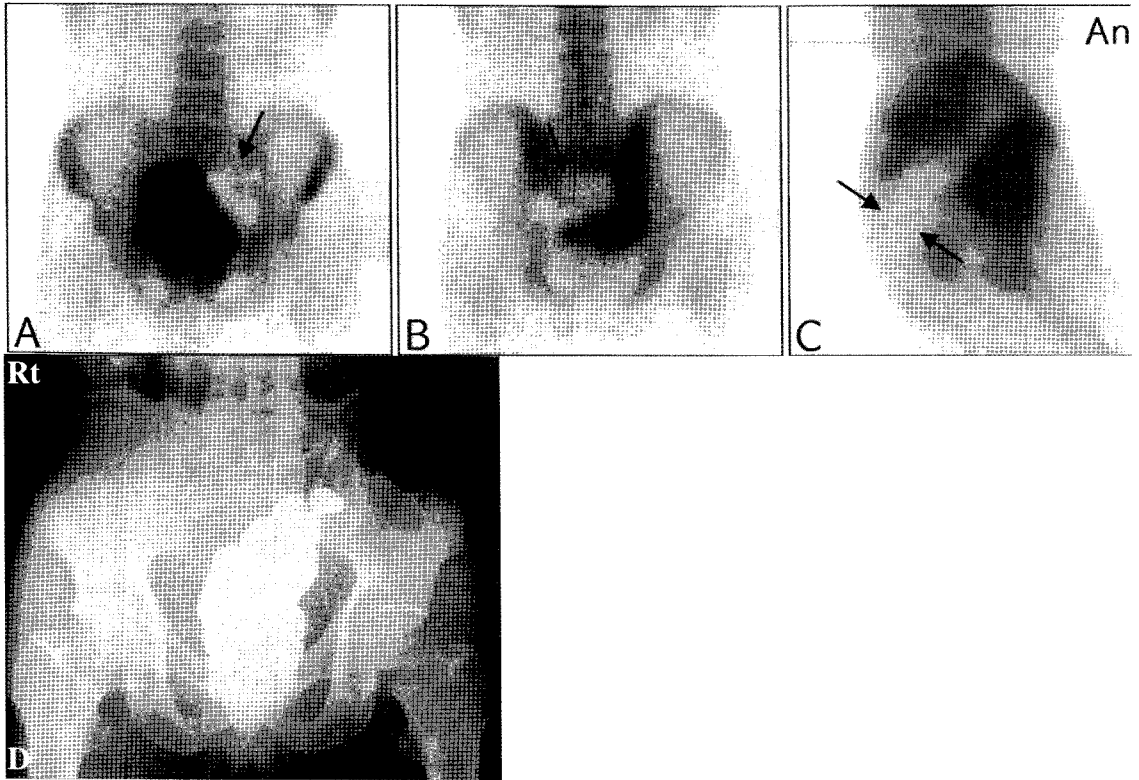


Fig. 1. A 72-year-old-man with adenocarcinoma of the stomach underwent Tc-99m MDP bone scintigraphy for the evaluation of bony metastases. (A) Anterior and (B) posterior images of the bone scintigraphy demonstrated a photon defect in the sacrum (arrows). (C) On the lateral image of the pelvis, the photon defect in the sacrum was not seen. A tubular shaped photon defect (arrows) was demonstrated in the space between the sacrum and the bladder. (D) Plain radiography of the abdomen showed residual barium in the rectum from an upper gastrointestinal series performed three days prior to the bone scintigraphy. The photon defect was regarded as an attenuation artifact produced by residual barium in the rectum, and might cause a false impression of cold bone metastasis in a patient with known malignant disease.

unusual in location as in case 1, and was seen both on the anterior and posterior images, it might be mistaken for cold bone metastases. Therefore, it is essential that we get other views of images, take carefully patient's medial history, and correlate scintigraphic findings with plain radiography.

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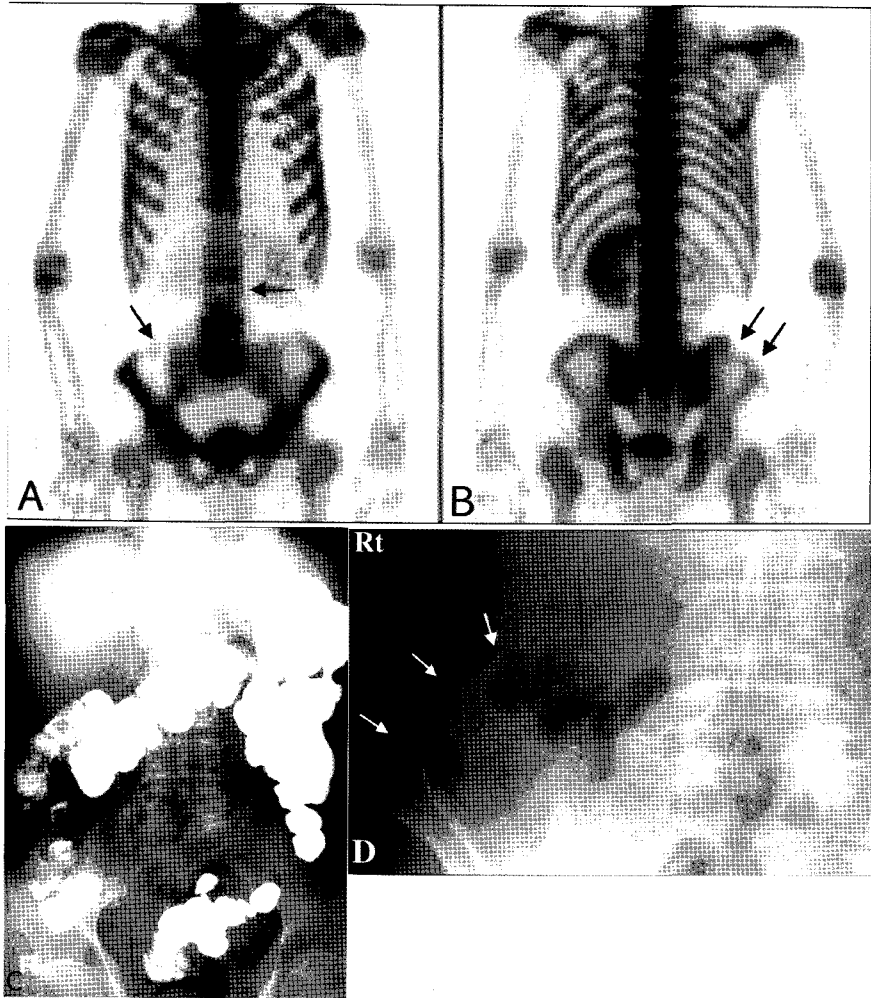


Fig. 2. A 61-year-old man with squamous cell carcinoma in the pharynx underwent Tc-99m MDP bone scintigraphy for the evaluation of bony metastases. Six years prior to the current admission, the patient had a subtotal gastrectomy for gastric cancer. Nine years ago, the patient had a traffic accident. (A) Anterior image of bone scintigraphy demonstrated photon defects (arrows) in the L3 vertebral body and the right iliac crest with decreased right renal activity. (B) Posterior image demonstrated photon defects (arrows) only along the right iliac crest. The photon defects might cause a false impression of cold metastases. However, if we carefully examined, the curvilinear or tubular shaped photon-deficient region could be recognized in the upper and right abdomen. Two days before bone scintigraphy, the patient had a barium enema. (C) Plain radiography of the abdomen demonstrated residual barium in the ascending colon, hepatic flexure of the colon, transverse colon causing artifactual defects. Seven days later, (D) follow-up plain radiography of the abdomen demonstrated bony defects (arrows) along the right iliac crest due to previous traffic accident, corresponding to photon defects along the right iliac crest revealed in the posterior image. Decreased right renal activity correlated with stenosis of the right renal artery on MRI of the abdomen.