

Benign Vertebral Accumulation of ^{99m}Tc -phytate

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ABSTRACT. The authors present a case of increased accumulation of ^{99m}Tc -phytate in the third lumbar vertebra without obvious compression fracture. The affected vertebral body showed low signal intensity on T1-weighted MR images and high signal intensity on T2*-weighted images. Increased accumulations of ^{99m}Tc -MDP and ^{67}Ga -citrate were also noted. Although the findings other than those on ^{99m}Tc -phytate scintigraphy were consistent with bone metastasis, the follow-up study suggested that the lesion was essentially benign. The findings on colloid imaging were useful to evaluate the condition of the vertebral lesion.

Key words: ^{99m}Tc -phytate—scintigraphy—vertebra—bone marrow metastasis

Focal areas of increased marrow activity on ^{99m}Tc -colloid scintigraphy have been described in degenerative joint disease¹⁾ and recent vertebral compression fractures.²⁾ We experienced a case of focal increased accumulation of ^{99m}Tc -phytate in the third lumbar vertebra without obvious compression fracture that was noted during a liver scan performed to rule out liver metastasis. Concomitant increased accumulations of ^{99m}Tc -MDP and ^{67}Ga -citrate were transient, suggesting that the condition was benign in nature. This case report is the first to describe the increased accumulation of colloid in the vertebra without compression fracture.

CASE REPORT

A 64-year-old man was diagnosed as having a laryngeal cancer in 1992. Liver scintigraphy with ^{99m}Tc -phytate (April 4, 1992), bone scintigraphy with ^{99m}Tc -MDP (April 6, 1992) and ^{67}Ga scintigraphy (April 11, 1992) were performed to rule out distant metastasis. On liver scintigraphy, no abnormality was shown in the liver, whereas abnormal focal accumulation was noted in the third lumbar vertebra (Fig 1). Both bone and ^{67}Ga scintigraphies also showed abnormal accumulations in the third lumbar vertebra (Fig 2). However, no evidence of compression fracture was demonstrated on plain radiography. Further studies with X-ray CT and MRI were performed to evaluate this vertebral lesion. X-ray CT showed only osteoporotic change in lumbar vertebrae, with neither osteoplastic nor destructive changes (Fig 3). On the other hand, the signal intensity of the third lumbar vertebral body was diffusely

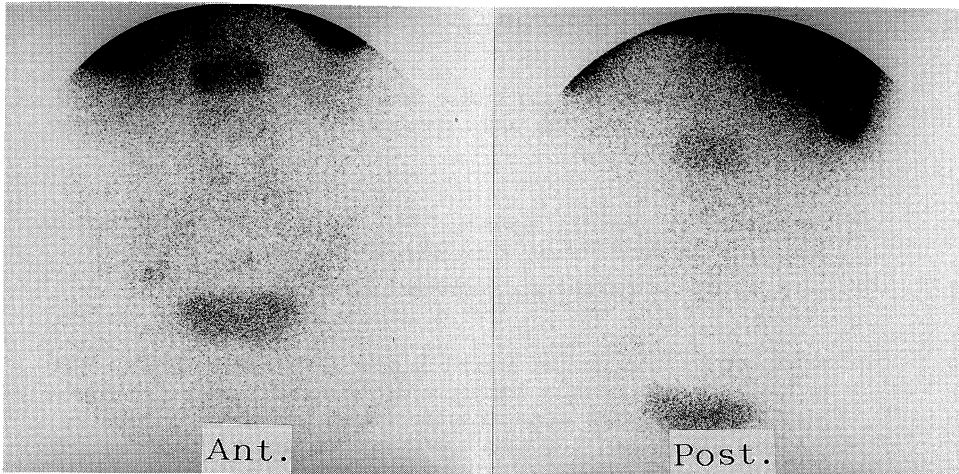


Fig 1. Anterior and posterior images obtained at 30 minutes after ^{99m}Tc -phytate injection show increased accumulation in the third lumbar vertebra.

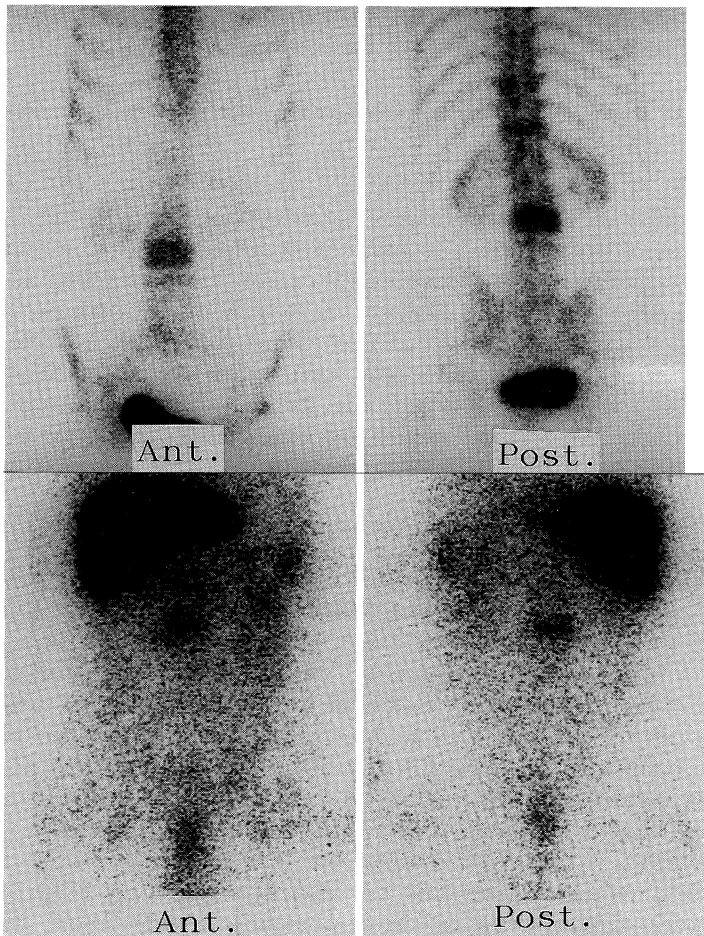


Fig 2. Bone (a) and ^{67}Ga scintigraphies (b) show marked homogeneous accumulation in the third lumbar vertebra. The mildly increased accumulations in lower thoracic vertebrae on bone scintigraphy are due to old compression fractures.

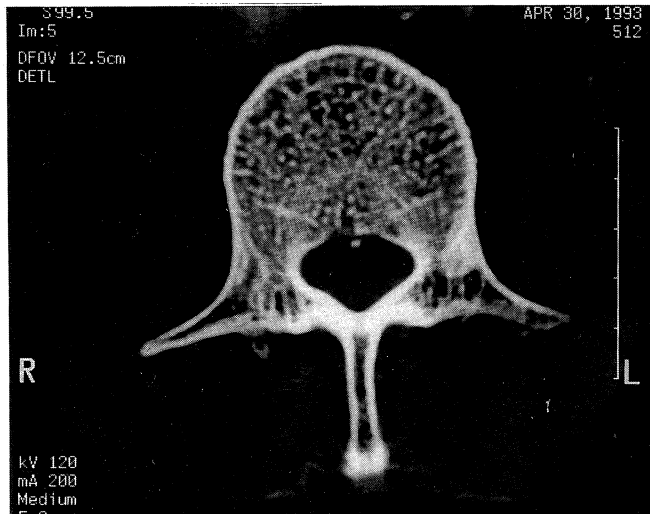


Fig 3. XCT image at the level of the mid L-3 vertebral body. No signs of focal tumor infiltration nor infection are observed.

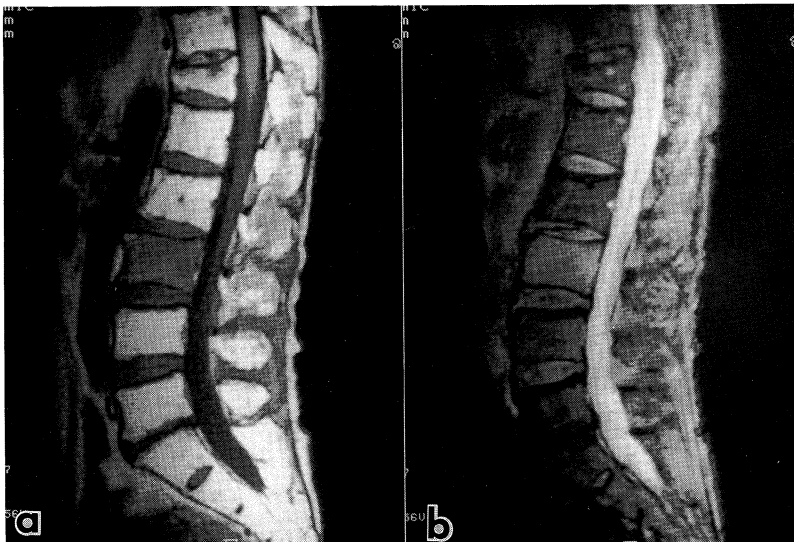


Fig 4. Midline sagittal MR images of vertebrae. A T1-weighted spin echo image (420/25) (a) shows diffusely decreased signal intensity and a T2*-weighted gradient echo image (480/30, FA : 25°) (b) shows mildly increased signal intensity. Benign vertebral collapse of Th12 is also noted.

decreased on T1-weighted MR images, and mildly increased on T2*-weighted images (Fig 4).

The findings other than those on ^{99m}Tc -phytate scintigraphy were consistent with diffuse neoplastic or infectious infiltration of bone marrow. Because of the patient's declination, biopsy was not performed to obtain a definitive diagnosis. After successful operation on the laryngeal cancer, the patient has been followed up uneventfully for more than two years. No clinical symptoms or signs related to this vertebral lesion have been observed. Follow-up studies

of bone and ^{67}Ga -scintigraphies, which were performed two years after the initial scintigraphies, suggested that the lesion was essentially benign (Fig 5).

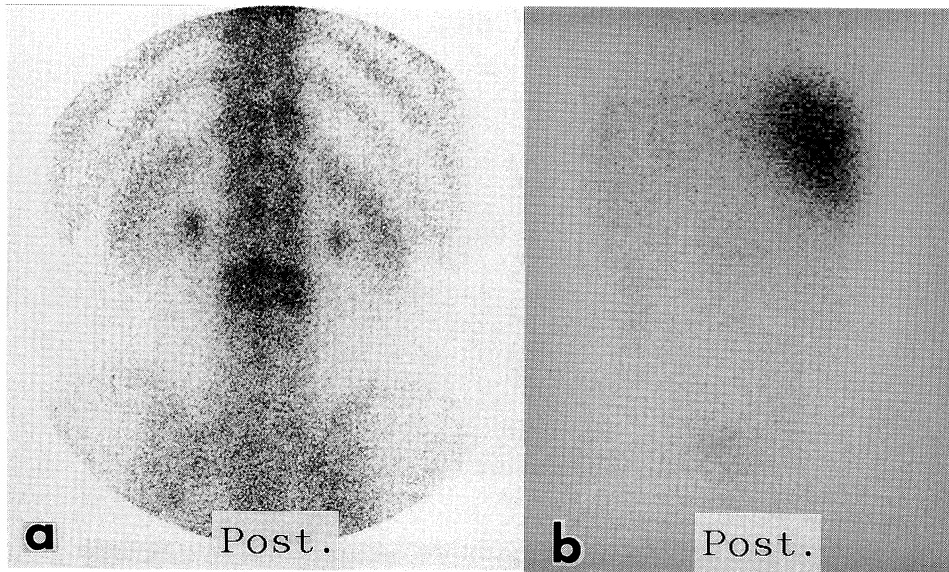


Fig 5. Follow-up bone (a) and ^{67}Ga (b) scintigraphies performed two years after the initial scintigraphies. Both studies demonstrate decreased accumulations in the third lumbar vertebra.

DISCUSSION

According to our previous $^{99\text{m}}\text{Tc}$ -colloid study, 4-10% of the administered dose was deposited in the marrow and 57-90% in the liver.³⁾ In patients with liver cirrhosis, a higher percentage will be taken up by the bone marrow and the spleen. Areas of focal increased activity on marrow scans have been described in degenerative joint disease¹⁾ and recent vertebral compression fractures.²⁾ The mechanism for focal increased activity of radio-colloid in vertebral compression fractures has been explained on the basis of local hyperemia, and increased phagocytic and reticuloendothelial cell activity in acute fracture.

In our case, plain radiography demonstrated no apparent compression fracture. The findings on MRI and bone and ^{67}Ga scintigraphies favored the diagnosis of bone metastasis. However, in the metastatic or infectious site, bone marrow activity is usually decreased on colloid scintigraphy.^{4,5)} Follow-up studies with bone and ^{67}Ga scintigraphies demonstrated no evidence of bone metastasis. Plain radiography showed no significant changes during the follow-up period. Taken together, the condition appears to be essentially benign; presumably, transient inflammatory or edematous marrow change. In such a case, local hyperemia and increased phagocytic activity might occur in a similar manner to fresh compression fractures.

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