

Diffuse hepatic uptake of ^{99m}Tc methylene diphosphonate on bone scintigraphy in a case of hypercalcemia and diffuse large B cell lymphoma

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A 57 years old man was diagnosed by histology of left axillary node as having diffuse large B cell lymphoma. Laboratory investigations revealed hypercalcemia with serum calcium level of 2.9mol/L (normal range: 2.08-2.60). Other blood examinations including complete blood count, coagulation markers, serum parathyroid hormone (PTH), liver and renal function and electrolytes other than calcium were normal. The patient underwent a whole-body bone scan in the anterior and posterior projections performed using a Siemens dual-head camera of Germany for the evaluation of possible bone disease of lymphoma 3h after the intravenous injection of 925MBq technetium-99m methyl diphosphonate (^{99m}Tc MDP). Interestingly, the whole-body bone scan images showed diffuse accumulation of ^{99m}Tc MDP in the liver (Fig. 1A-B). The patient was not known to have any liver disease. On the same day, no other patients who had bone scan had an abnormal liver uptake. However, because of the concern of possible hepatic involvement of malignancy, a diagnostic contrast computed tomography was performed, which only revealed a small "liver cyst" in addition to thoracic and lumbar collapse (Fig. 1C-D).

Hypercalcemia is observed as an accompanying disease in approximately 20%-30% of cancer patients whose prognosis has been generally poor [1]. The hypercalcemia that is frequently associated with Hodgkin's and non-Hodgkin's lymphomas (NHL) has been well documented in previous studies, which demonstrated that only 7.1% of B-cell NHL showed a high serum calcium level [2-4]. For hypercalcemia in lymphomas, the primary cause is that the involvement of the active form of vitamin D ($1.25\text{-(OH)}_2\text{D}_3$) enhanced the osteoclastic bone resorption and intestinal absorption [5].

Diffuse bone tracer uptake in the liver can occur when there is aluminum breakthrough in radiopharmaceutical preparation [6]. In addition, diffuse hepatic ^{99m}Tc MDP uptake can also occur due to many other causes, such as respiratory failure, hepatitis, amyloidosis, iron therapy, high-dose methotrexate therapy, thalassemia, liver necrosis and gadolinium-containing magnetic resonance imaging contrast administration before ^{99m}Tc MDP injection [6-7].

An elevated serum calcium phosphate producing a

transient diffuse accumulation of ^{99m}Tc MDP in the liver has been demonstrated for multiple myeloma patients [8-9] serum calcium: 12.9mg/dL. *In conclusion*, diffuse hepatic accumulation of ^{99m}Tc MDP on the whole-body bone scan in lymphoma patient with hypercalcemia is extremely rare. Only Sullivan et al. (1986) reported abnormal lung and liver uptake of gallium-67 and ^{99m}Tc MDP in hypercalcemia of lymphoma with metastatic pulmonary calcification [10]. Our case also demonstrated that accumulation of ^{99m}Tc MDP in the liver does not necessarily mean severe liver damage neither very high serum calcium.

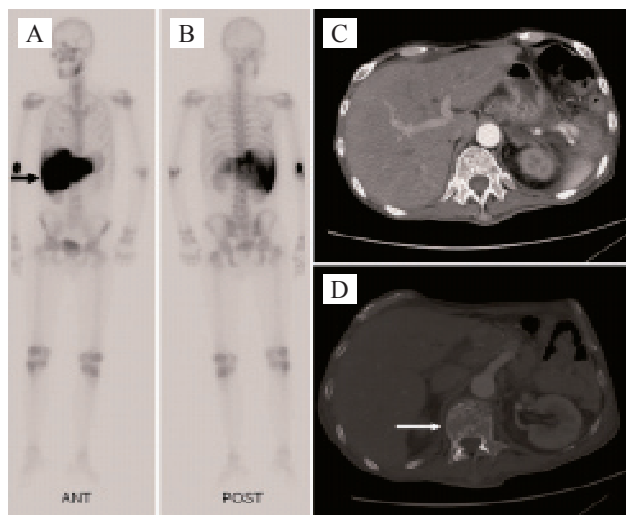


Figure 1. Whole-body bone scan images showed intense diffuse accumulation of ^{99m}Tc MDP in the liver (A-B: arrow); Contrast computed tomography revealed a small "liver cyst" (C: arrow); Contrast computed tomography revealed thoracic and lumbar collapse (D: arrow)

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Mary Cassatt 1897: *Mother's kiss*. Fine Arts Museum, Philadelphia.