

Splenic Accumulation of ^{99m}Tc -Diphosphonate

Recently, Goy and Crowe reported splenic accumulation of ^{99m}Tc -diphosphonate in a patient with sickle cell disease (1). This uptake was assumed to result from splenic infarction and subsequent calcification. I should like to report on a patient with Hodgkin's disease who had splenic uptake of ^{99m}Tc -diphosphonate without any evidence of calcification.

The patient was a 63-year-old woman with malignant lymphoma, histiocytic type. The diagnosis was made by bone marrow biopsy. Physical examination showed jaundice with hepatosplenomegaly. There was no adenopathy. Laboratory data were as follows: hematocrit 24.7%; hemoglobin 8.1 mg/100 ml; WBC 5,300/mm³; platelets 25,000/mm³; 2-4 nucleated RBCs per 100 WBCs; reticulocyte count 18-19%; total bilirubin 8.3 mg/100 ml (direct 5.3 mg/100 ml); total protein 5.1 gm/100 ml; albumin 2.0 gm/100 ml; alkaline phosphatase 255 units; LDH 690 units; and SGOT 222 units. Direct and indirect Coombs' tests were negative.

A bone scan was performed as part of the initial workup. Anterior and posterior rectilinear scans were obtained with a 5-in. dual-probe scanner (Ohio-Nuclear, Solon, Ohio) about 3 hr after injecting 15 mCi of ^{99m}Tc -diphosphonate (Fig. 1). The images were displayed with 1:5 minification on transparent film. The accumulation of tracer was uniform in the enlarged spleen. Liver-spleen scintigrams with ^{99m}Tc -sulfur colloid confirmed the splenomegaly but also revealed two, or possibly three focal defects in the spleen laterally, consistent with lymphomatous infiltration or infarcts (Fig. 2). Plain abdominal radiographs failed to show any splenic calcification.

At autopsy, 1 month later, the spleen was grossly enlarged. On cross section, it was dark red and congested. Microscopically the red pulp showed focal areas of congestion, but it was most remarkable for the presence of extensive lymphomatous infiltration. The white pulp had been entirely replaced by lymphoma. There were two white wedge-shaped defects representing recent infarcts. There was no evidence of calcium deposits in the spleen. The bone marrow, para-aortic lymph nodes, liver, and kidneys were also extensively infiltrated by lymphoma.

Splenic uptake of bone-seeking agents in Hodgkin's disease with splenic involvement has been described previously (2). In the absence of calcification and inflammation, it presumably reflects tracer accumulation in tumor due to a poorly understood affinity of bone-seeking agents for neoplastic tissue. Our patient was diagnosed as having a Stage IV malignant histiocytic lymphoma complicated by a Coombs-negative hemolytic anemia and thrombocytopenia. The hemolytic anemia suggested splenic sequestration of red blood cells with increased iron deposition in the spleen. This raises another possible explanation for splenic uptake of bone-seeking agents. High concentrations of extracellular iron will result in abnormal uptake of ^{99m}Tc -diphosphonate in soft tissue in the absence of elevated calcium levels (3). Thus, the splenic localization of ^{99m}Tc -diphosphonate in this

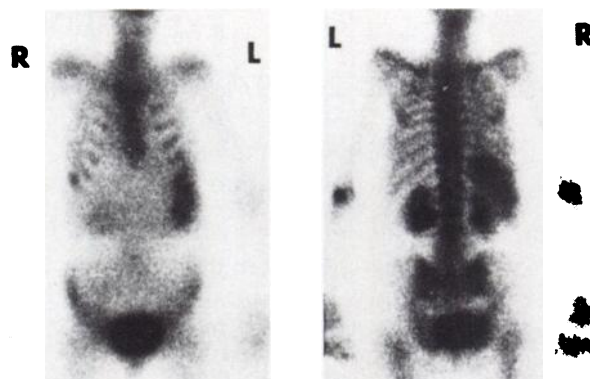


FIG. 1. Anterior and posterior rectilinear bone scans with ^{99m}Tc -diphosphonate show abnormal uniform uptake in enlarged spleen. Increased uptake in one right lower rib reflects autopsy-proven healing fracture.

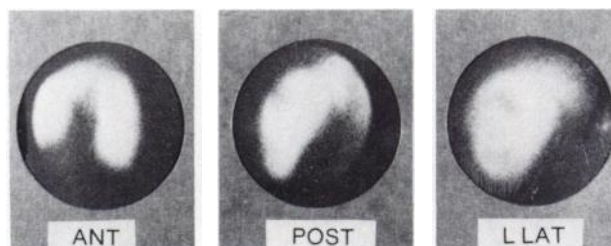


FIG. 2. Scintigrams of spleen with ^{99m}Tc -sulfur colloid. Anterior, posterior, and left lateral views show enlarged spleen with two or three focal defects along its lateral margin.

patient might have been a reflection of an elevated iron content in the spleen. This mechanism of accumulation of ^{99m}Tc -diphosphonate is supported by the absence of increased radioactivity in the liver and para-aortic lymph nodes despite extensive lymphomatous involvement.

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REFERENCES

1. GOY W, CROWE WJ: Splenic accumulation of ^{99m}Tc -diphosphonate in a patient with sickle cell disease: Case report. *J Nucl Med* 17: 108-109, 1976
2. CHAUDHURI TK, CHAUDHURI TK, SUZUKI Y, et al.: Splenic accumulation of ^{87m}Sr in a patient with Hodgkin's disease. *Radiology* 105: 617-618, 1972
3. FRANCIS MD, TOFE AJ: Experimental biochemistry of infarct imaging. Paper presented at the Donner Laboratory-Kaiser Hospital Workshop on Imaging Myocardial Infarcts, held in Oakland, California, October, 1974