## Liver–Spleen Scan in Sickle Cell Anemia

Goy and Crowe (*1*) recently reported splenic accumulation of $^{99m}$Tc-diphosphonate in a patient with sickle cell anemia. We describe below one of our cases of sickle cell anemia, which also involved unusual scan findings.

A 24-year-old man was referred for a liver scan with a diagnosis of cirrhosis of the liver. His history suggested repeated hemolytic episodes. On physical examination the liver was 3–4 fingers palpable, firm, and tender, while the spleen was 2–3 fingers palpable and firm but not tender.

Liver–spleen scans with 2 mCi of $^{113m}$In-colloid showed an enlarged liver with several "cold" areas (Fig. 1A). The enlarged spleen was not visualized at all, even in the posterior view (Fig. 1B). Chromium-51-tagged RBCs, injected intravenously, also failed to show the spleen. This functional asplenia (*2*) prompted us to further investigation. Sickle cell anemia was proved by finding sickle cells on a peripheral smear and by the presence of HbS on electrophoresis.

Coeliac axis angiography showed splenic artery occlusion. The liver showed "nonvascular" areas with occlusion of the blood vessels corresponding to the "cold" areas on the scan.

The sequelae of sickle cell anemia attributed to reduction and crystallization of hemoglobin, with subsequent stasis and sludging of sickled erythrocytes in the splenic vessels, are well recognized (*3*). Vascular occlusions, ischemic parenchymal degeneration, and necrosis result in atrophy and fibrosis. In our case, the "cold" areas in the liver and the functional asplenia correlated with the narrowed and occluded blood vessels, suggesting the presence of infarcts in the liver and spleen.

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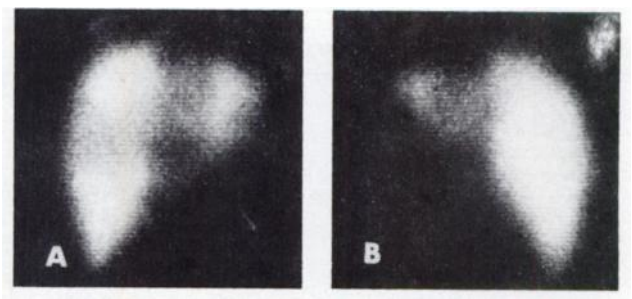


**FIG. 1.** Liver–spleen scan done with $^{113m}$In-colloid shows numerous "cold" areas in liver. Spleen is not visualized in anterior (A) and posterior (B) views.

## Pleural Oligemia Seen in Bone Scanning

In the January issue of the *Journal*, Preisman and Halpern described bone scans in two patients with underlying lung disease (*1*). The authors attributed the increased clarity of the ribs to oligemia in the underlying lung. In both of these cases there was severe concomitant pleural disease. Considering the HVL of only 4.5 cm for the 140-keV $^{99m}$Tc photon in soft tissues, and the considerable blood clearance of pyrophosphate expected by the time of imaging, it initially seemed to us that the phenomenon might be explained equally well by attenuation of the gamma photons emitted by the underlying tissues. However, we later encountered a similar scan with increased distinctness of the left rib cage (Fig. 1). The patient had had a left upper lobectomy for bronchogenic carcinoma in 1971 and a subsequent course of radiation therapy to the mediastinum for recurrent tumor involving the left hilum. The chest radiogram showed loss of volume and oligemia of the left lung with only minimal pleural changes at the costophrenic angle. A lung scan taken with $^{99m}$Tc-macroaggregated albumin revealed markedly decreased perfusion of the left lung compared to the normal right lung (Fig. 2). The disparity was much greater than could be attributed to the difference in respective lung volumes, thus indicating reduced pulmonary blood flow per

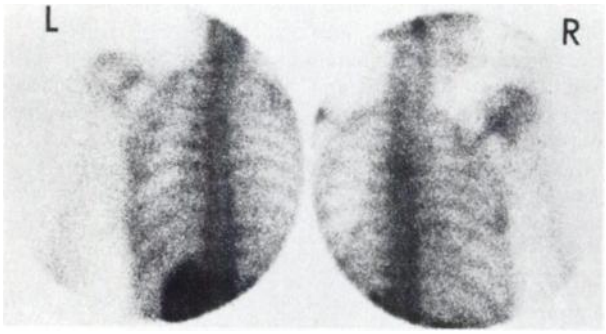


**FIG. 1.** Posterior views of thorax on $^{99m}$Tc-pyrophosphate bone scan show increased distinctness of ribs on left side.

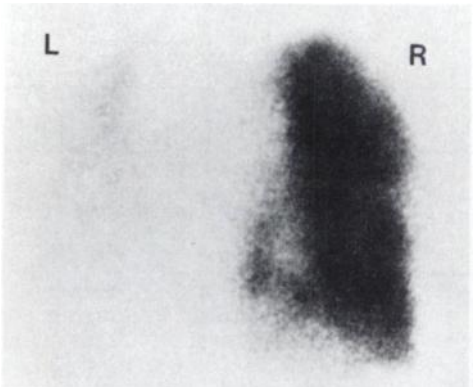


**FIG. 2.** Lung scan taken with $^{99m}$Tc-macroaggregated albumin shows severely diminished blood flow to left lung.