

**Liver Scan in Budd–Chiari Syndrome**

In the May 1976 issue of the *Journal*, Drs. Meindok and Langer described the liver-scan findings in Budd–Chiari syndrome (1). They state that “when all major liver veins are occluded, markedly diminished uptake is seen over the peripheral parts of the right and left lobes with a triangular midline area of normal or excessive activity.” In Fig. 4 of their article they show a scintigraph of Case 7 to illustrate this finding.

In our experience we have seen many scintigraphs that have an appearance similar to this, with the right lateral and superior margins of the liver displaced from the right lateral abdominal wall and diaphragm. We have always attributed this finding to the large volume of ascitic fluid present in these patients. The authors do not mention this possibility as an explanation of their findings. It would be interesting to hear their comments on this point.

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**REFERENCE**

1. MEINDOK H, LANGER B: Liver scan in Budd–Chiari syndrome. *J Nucl Med* 17: 365–368, 1976

**Reply**

The correlation between the presence of ascites and the liver-scan finding of “diminished uptake in the periphery of the liver with a midline region of normal or increased uptake” has been so poor in our experience that we decided to omit the difficult and lengthy discussion on the possible effects of ascites on these scintiscans.

Ascites was present in our Patient 5, whose scan (Fig. 1) showed this unusual appearance. However, when her clinical condition deteriorated and ascites reappeared, her liver scan (Fig. 3) showed exactly the opposite pattern, namely, increased uptake at the periphery with decreased activity in the midline. Clearly, one could not claim that ascites produced peripherally decreased uptake at one time and increased uptake at another. One could say that the peripherally increased uptake in Fig. 3 was produced despite the presence of ascites, therefore saying in fact that ascites had little or no effect in producing the unusual scan appearance in this patient with Budd–Chiari syndrome.

Ascites was frequently absent in other patients showing this scan finding, as mentioned in our differential diagnosis, and therefore could not have accounted for this scintigraphic sign. One of our two patients with alcoholic cirrhosis had ascites; the other did not. Reference 12 in our article describes a patient with hepatic infarction, again without ascites. Reference 11, page 129, shows a liver scan in fatty metamorphosis and, on page 146, a scan in congestive car-



**FIG. 4.** Anterior liver scintigram in Case 7, in which only the median hepatic vein is patent, shows diminished uptake at periphery of right and left lobes and increased uptake near midline.

diac failure, both with ascites, yet “the distribution of activity is homogeneous without focal defects.”

Because of this poor correlation between the ascites and the unusual scan finding, we elected to omit the long discussion on ascites in our condensed article. Instead, we listed various liver diseases showing this sign in the belief that it was the nature and distribution of the disease in the liver (shown by liver biopsy, venography, or autopsy) that determined the scintigraphic pattern. We have not had the opportunity to scan patients with ascites who have normal liver anatomy and physiology to assess the effect of ascites alone on scintigraphic appearances.

The scan of Patient 7 (Fig. 4, reprinted above) shows, in addition to the unusual scan pattern, three signs suggestive of ascites (which this patient had): a band of absent activity between the lower border of the lungs and the upper surface of the liver; displacement of the liver medially with an area of absent activity between the ribs and lungs on one side and the liver on the other; and a blurred outer margin or “halo” measuring about 1–2 cm in width, caused probably by excessive or abnormal movements of the liver as it “floats” in ascitic fluid. Inferior lateral parts of the liver, measuring about 5–6 cm in width, show markedly diminished uptake and correspond to areas with occluded hepatic veins; the midline area with relatively increased uptake had a patent hepatic vein draining it.

These three signs of ascites on the liver scan are non-specific and can occur when air, blood, pus, or chyle is present in the peritoneal cavity, in subphrenic abscess, or in other space-occupying disease in the subphrenic region. In order to assess the effect of ascites on a liver scan, one should compare scintigrams of the same patient with and without ascites, preferably when liver anatomy and physiology are normal. As far as we know, this has not been done.

We hope that this somewhat lengthy explanation satisfactorily answers the queries raised by Dr. McLaughlin.

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