HEMANGIOMA OF THE LIVER TREATED BY IRRADIATION

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Benign vascular lesions involving the liver are not rare. The cavernous hemangioma in the adult is usually solitary in the liver although diffuse hemangiomatosis of the liver can occur (*1*). The major complication associated with hemangioma of the liver is rupture with fatal intraperitoneal hemorrhage (*2*). Although successful treatment with active intraperitoneal bleeding has been reported, the general feeling is that this condition is a fatal complication (*3*). Biopsy of the hemangioma, because of intraperitoneal bleeding, is often contraindicated.

In spite of the fact that mature blood vessels are not considered to be radiosensitive structures, successful treatment of cavernous hemangioma of the liver by radiotherapy has recently been reviewed and deemed to be successful (*4*). The following is a case report of a cavernous hemangioma successfully treated with radiation therapy and followed over 3½ years with liver scans.

CASE REPORT

A 46-year-old white female was referred to the Cedars of Lebanon Hospital, Radiotherapy Department, with discomfort in the right upper quadrant associated with eructation and regurgitation of food of 2-weeks duration. Examination revealed a mass in the right upper quadrant. Abdominal arteriogram on October 25, 1965, showed displacement of the intrahepatic branches of the right hepatic artery by a mass involving the entire right lobe of the liver (Fig. 1).

This mass contained multiple small and large irregular vascular spaces. The celiac axis was enlarged and displaced to the left of the aorta; the right kidney was displaced inferiorly and compressed on its lateral superior surface by the enlarged liver. Cholecystogram was within normal limits. Barium enema showed extrinsic pressure on the hepatic flexure, and the entire stomach and duodenum were displaced to the left on a GI series.

Scans were performed using radioactive gold to demonstrate functioning Kupffer cells and radioactive iodine-labeled albumin to show the vascular pool. All scans were performed on a Picker 5-in. Magnascanner. For Figs. 2 and 3, 150 μCi of ^{198}Au were injected 9 days before the scan so that the counting rate at Region A had reduced to 5,000 cpm. Then 500 μCi of ^{131}I-labeled albumin were injected and the scan begun immediately. The maximum counting rate from the ^{131}I-albumin was 25,000 cpm (Region A, Fig. 3).

A double-radioisotope technique showed that the right lobe of the liver did not take up the radioactive gold (Kupffer cells, Fig. 2) but did take up the ^{131}I-

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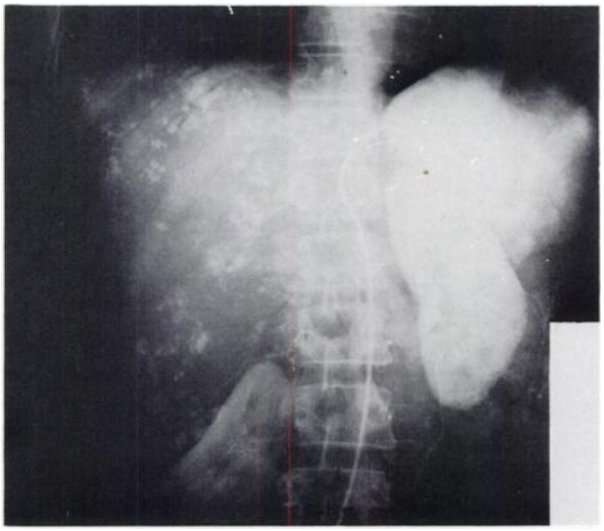

FIG. 1. Transfemoral hepatic arteriogram showing heavy vascular stain in right lobe of liver before irradiation 10-28-65.

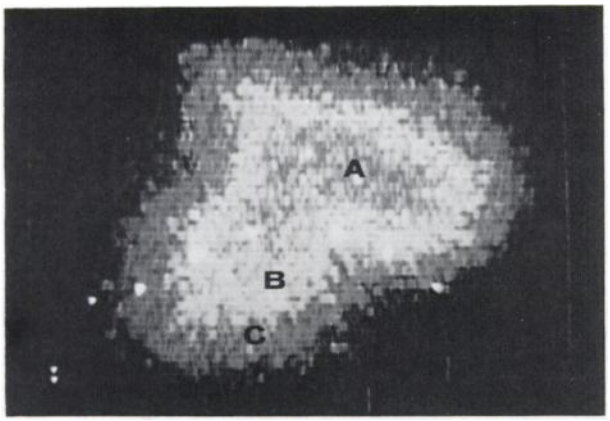

FIG. 2. Black and white copies of color Polaroids. Gold-198 liver scan showing defect in right lobe of liver before irradiation 10-22-65. Areas marked A–D are result of different colors on original scan, A being region of maximum radioactivity.

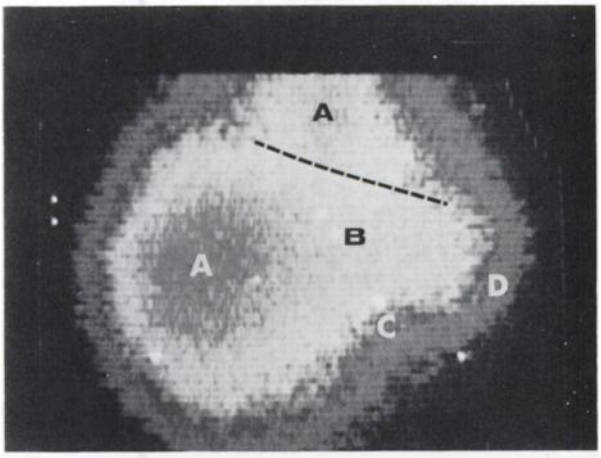

FIG. 3. Black and white copies of color Polaroids. IHSA liver scan shows vascular pool in area of defect before irradiation 10-22-65. Areas marked A–D are result of different colors in original scan, A being region of maximum radioactivity.

labeled albumin (vascular pool, Fig. 3), indicating that the cold area on the gold scan was very vascular.

A surgical consultant advised against a biopsy because of high incidence of mortality due to bleeding.

From October 29, 1965, through January 18, 1966, the patient received a total midtumor dose of 5,022 rads delivered through a single 10 × 12-cm field over the right lobe of the liver. The daily tumor dose was slowly increased from 30 rads by increments of 10–114 rads daily, 5 days a week.

On November 3, 1967, marked improvement in the vascular pattern of the liver was noted on scan; also on followup liver scans in June, 1970 (Fig. 4 and Fig. 5). The change in the liver scans may be generally characterized by the diminution of uptake in the right lobe region of ^{131}I-labeled albumin and improvement in the uptake in the same region by ^{198}Au. It should be emphasized that only the symptomatic area in the right lobe of the liver was irradiated, even though a careful analysis of the arteriogram and scans shows an increased blood vascular pool in the left lobe of the liver.

DISCUSSION

The premortem diagnosis of hemangioma of the liver is rare; however, when symptomatic, large hemangiomas of the liver are often fatal. Lobectomies for symptomatic patients, although sometimes successful, are fraught with catastrophe. Successful selective arterial ligation has been reported in a child (*5*), but it is doubtful whether in the majority of these lesions in the adult the vascular supply is such that selective arterial ligation will be fruitful.

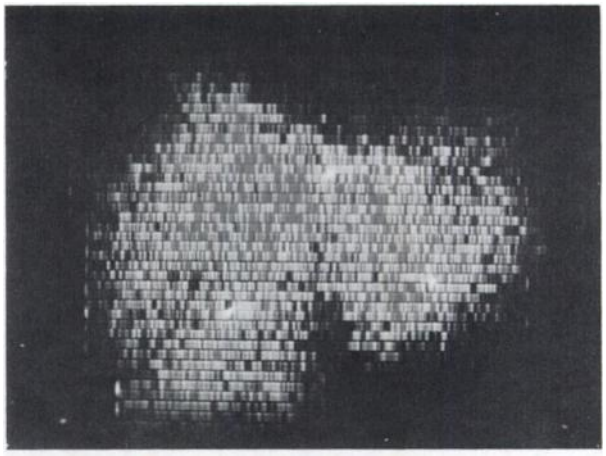

FIG. 4. Black and white copies of color Polaroids. Postirradiation, 1-19-70, followup ^{198}Au liver scan now showing improvement but patchy uptake in superior lateral aspect of right lobe of liver.

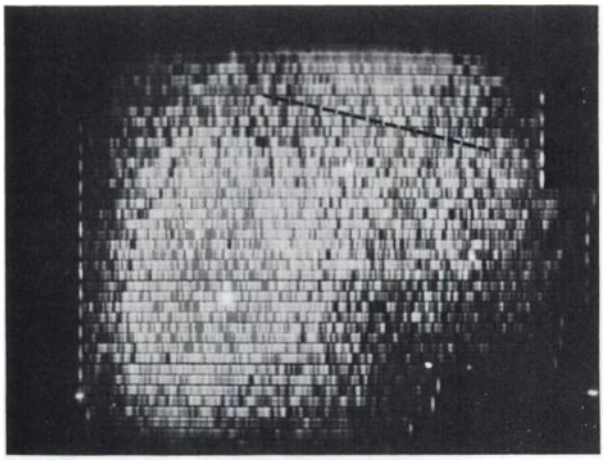

FIG. 5. Black and white copies of color Polaroids. Postirradiation, 1-19-70, followup IHSA liver scan shows decrease in vascular pool.

The preferred treatment of clinically significant hemangioma of the liver is surgical incision. It is more precise to have an adequate histopathologic study of any tumor upon which treatment is contemplated. Furthermore, irradiation therapy can harm normal liver tissue, and the response to radiation therapy of an adult cavernous hemangioma is unpredictable. The mortality from biopsy and/or excision of these tumors, however, encourages one to explore alternative treatment techniques.

This case is interesting in that the response to radiation has been demonstrated by double-scanning techniques. It is difficult from this case report and a review of the literature to state exactly what dose is necessary to cause a diminution in size of a cavernous hemangioma. Because of irradiation hepatitis, it behooves one to fractionate carefully if doses higher than 2,500 rads are contemplated (*6*). Since the probability of irradiation hepatitis increases directly with the volume of liver treated, the value of irradiating only the symptomatic portion of the liver has been shown in this patient.

SUMMARY

A case of symptomatic adult hemangioma of the liver treated by external irradiation is presented. Diagnosis has been made on the basis of liver scans with ^{198}Au and IHSA and a hepatic arteriogram. Followup by serial liver scans for more than 3 years and evidence of improvement consisting of shrinkage of angiomatous masses is presented.

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