

HEPATIC ARTERY-PORTAL VEIN FISTULA DETECTED ON HEPATIC FLOW STUDY: CASE REPORT

John J. Sziklas and Richard P. Spencer

Hartford Hospital and University of Connecticut Health Center, Farmington, Connecticut

A man with a history of gunshot wounds presented with jaundice and a bruit over the upper abdomen. The radionuclide flow sequence revealed simultaneous perfusion of the liver with transit of the activity down the aorta. This was considered compatible with a fistula between the hepatic artery and portal vein (confirmed angiographically and at autopsy). An expanding aneurysm of the hepatic artery produced an enlarging focal parenchymal defect.

Hepatic flow studies have been used principally to detect increased early (arterial) influx to intrahepatic malignancies or other abnormal processes (1,2). We have had the opportunity to use such a dynamic sequence to detect a hepatic artery-portal vein fistula.

CASE REPORT

A 52-year-old man was admitted with jaundice of 2 weeks' duration. Three years before this examination he sustained gunshot wounds to the abdomen that required a right nephrectomy, repair of lacerations of the inferior vena cava, portal vein, liver, and small intestine. Six months after the original trauma a second gunshot wound required repair of perforations of the small and large intestine. The patient denied other trauma or the chronic use of ethanol. Physical examination revealed jaundice, well-healed abdominal scars, minimal hepatomegaly, and a bruit over the upper abdomen.

After intravenous administration of ^{99m}Tc -sulfur colloid (6 mCi) serial scintiphotos of the abdomen demonstrated early filling of the liver virtually simultaneous with flow through the abdominal aorta (Fig. 1). Early hepatic filling on the dynamic sequence and the bruit over the abdomen indicated artery-portal vein fistula.

Two static liver scintiphotos, obtained 1 week

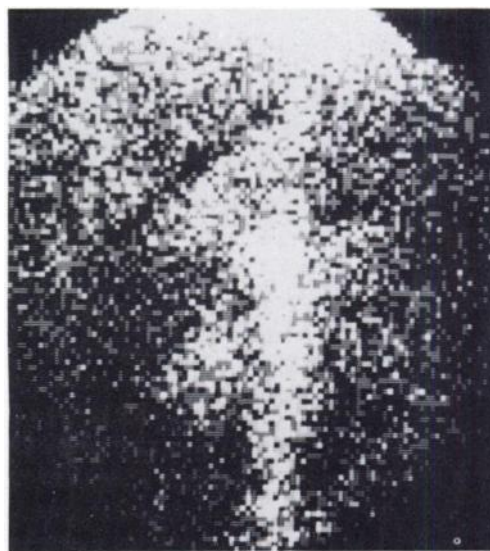


FIG. 1. Sequence from dynamic study. Hepatic filling can be seen simultaneously with activity in aorta. Prior right nephrectomy accounts for nonvisualized kidney. Clear band across liver is due to lead marker on costal margin.

apart, revealed an enlarging defect of the lower border. The flow sequence and enlarging defect suggested an expanding lesion such as an aneurysmal dilation of the artery near the fistula. An angiogram confirmed the hepatic artery aneurysm, and the hepatic artery-portal vein fistula (feeding a branch of the portal vein) was identified and repaired. Hepatic artery ligation was necessary. The patient later died of acute tubular necrosis. Posterior scintiphotos of the liver (Fig. 2) had revealed a small and well-defined defect that was explained by the finding at autopsy of a bullet lodged posteriorly in the right diaphragm.

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For reprints contact: Richard P. Spencer, Dept. of Nuclear Medicine, School of Medicine, University of Connecticut Health Center, Farmington, Conn. 06032.

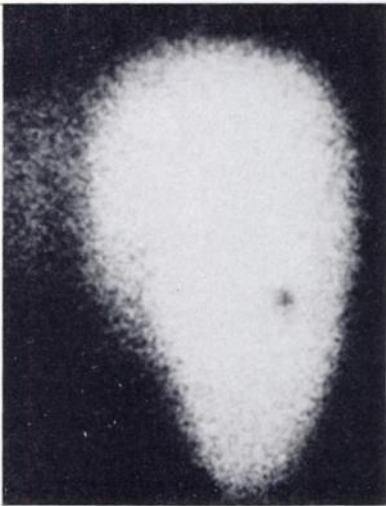


FIG. 2. Posterior scintiphoto of liver reveals small, well-defined defect. At autopsy, bullet was noted in posterior right diaphragm, which was possibly responsible for absorptive defect.

DISCUSSION

Significant arteriovenous fistulas between the hepatic artery and portal vein occur infrequently. In a review of the literature from 1882 to 1971, Foley and coworkers (3) found that in 11 of 25 reported cases the lesion was extrahepatic; in two of the five cases contributed by this study, a bruit was noted in the epigastrium. Foley, et al emphasized the role of angiography in establishing the diagnosis. In a case report by Malette and associates (4), a ^{99m}Tc -sulfur colloid scan revealed a large defect in the right lobe of the liver created by traumatic intrahepatic arteriovenous fistula. No dynamic study was reported. Itzhak and associates (5) have described a number of instances in which intrahepatic arterial-to-portal communications have occurred.

The dynamic radionuclide study made a significant contribution in this case. Since the hepatic artery supplies only a small portion of the total blood flow to this organ, little activity is normally seen in the liver during the first transit of the radiopharmaceutical through the aorta (1). When increased early blood flow is caused by hypertrophied hepatic arterial supply, significant activity can be detected in the liver almost simultaneously with aortic activity. Computer quantification of this phenomenon has been described. In the present case there was obvious filling of the liver on the flow sequence.

Massive and rapid filling of the liver on the dynamic study and a bruit indicate an arteriovenous communication. In the case reported here, the large volume of blood flow in the arteriovenous communication and the expanding defect of the liver suggested an aneurysm of the hepatic artery that was later confirmed.

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