CLINICAL APPLICATION OF PORTAL VENOGRAPHY

BY

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The differential diagnosis and the full clinical assessment of splenomegaly can even to-day be an interesting and at times puzzling task. Conditions are met with in which the aetiology and pathogenesis of an enlarged spleen remain unexplained in spite of exhaustive bedside study and radiological investigations.

Modern advances in vascular surgery alone make it desirable that there should be a clear recognition of those cases of splenomegaly in which some of the symptoms can be remedied by vascular anastomosis for relief of portal hypertension. Attempts to demonstrate the portal system by injection of radio-opaque substances into a branch of the coronary vein, into veins draining the caecum, into the main portal branch, and into the branches of the splenic vein were carried out in recent years (Blakemore and Lord, 1945; De Sousa Pereira *et al.*, 1949; Moore and Bridenbaugh, 1950; Santy and Marion, 1951). The techniques employed were difficult, and not without risk to the patient, and, of course, only possible after laparotomy.

Abeatici and Campi (1951) were the first to describe a method of percutaneous portal venography in a dog via the spleen and splenic vein, and Leger (1951) applied the same technique in man for the first time. Soon afterwards, Boulvin and co-workers (1951) described their technique of portal venography by the same route in great detail. Their first patient suffered from cirrhosis of the liver and the second from an extrinsic obstruction of the splenic vein. These authors pointed out the potential value of the method for the differentiation of intrahepatic and extrahepatic block. Dreyer and Budtz-Olsen (1952) applied splenic venography in 11 patients with palpable spleens and again suggested the clinical application of the method. Milnes Walker and co-workers (1952) were the first in this country to publish their findings of portal venography by intrasplenic injection on 12 occasions, again in patients with enlarged spleens. Of particular interest was their demonstration of the flow from the portal vein into the left inferior vena cava nine months after successful end-to-side anastomosis between the portal vein and the inferior vena cava.

Konar and Sen Gupta (1953) related their experiences of splenic venography in 14 cases, which included cases of portal hypertension and of splenomegaly of unknown cause.

Present Investigation

We have applied the method of percutaneous intrasplenic injection on over 50 occasions, using a similar technique to that described by Boulvin and co-workers. Good contrast was obtained with 50% diodone, and this strength was used in all but one patient, who received a 70% solution. In some patients several films were taken at three-second intervals, but in most cases we were satisfied with the result of a single exposure after an injection of 18 ml. of the solution. A fine flexible lumbar-puncture needle with short bevel was used. The needle was entered in the left posterior axillary line just below the tenth rib with the patient on his

FIG. 1.—Unusual but not abnormal splenogram.

FIG. 2.—Splenogram in pernicious anaemia with splenomegaly.

back, but we have also obtained satisfactory pictures by injection into the tenth intercostal space in the scapular line, with the patient lying face down. The technique in normal people with healthy spleens is naturally far more difficult than in cases of splenomegaly.

Exact location of a healthy spleen by percussion was nearly always impossible, and we therefore had to rely on touch when the needle met resistance on entering the spleen. Several times we failed to hit the spleen and diodone was injected into the peritoneal cavity, and on at least one occasion into the splenic flexure of the colon. No ill effects followed. With growing experience we learned to appreciate the degree of resistance to the injection which is to be expected when the needle has pierced the spleen. We found the spleen a rather mobile organ, which may move about 2 in. (5 cm.) medially before the needle point enters the splenic capsule. In consequence the splenic vein appeared kinked, as shown in Fig. 1, which was the result of an injection into a healthy spleen through the scapular line. Tortuosity of the splenic veins was observed on several occasions in healthy people as well as variations in the size of the splenic and portal veins. In our experience no significant changes are to be expected after diodone injections into enlarged spleens without portal hypertension or extrahepatic obstruction. The dye did not spread to any extent within the spleen, and distinct filling of the splenic and portal veins and its intrahepatic branches was observed using no more than 12–18 ml. of diodone (Fig. 2). The intrahepatic distribution of the portal vein is shown up in a liver grossly enlarged due to melanoblastoma (Fig. 3).

Fig. 4 belongs to a series of eight splenograms taken in a patient with cirrhosis of the liver over a period of 14 months. The degree of portal hypertension as seen on portal venography varied in this patient, corresponding to changes in the clinical picture. A chronic hepatitis was originally confirmed by laparotomy, and his liver disease

was complicated by right lower lobe bronchiectasis. Each acute attack of bronchial suppuration was followed by deepening jaundice and increasing ascites, which improved under streptomycin treatment. We obtained normal splenograms in this patient when the ascites and jaundice subsided, but could demonstrate anastomoses with gastric veins of varying degree during acute exacerbations of hepatitis, of which Fig. 4 is one example. A severe degree of portal hypertension in another patient with appearances of oesophageal veins is demonstrated in Fig. 5. We were able to demonstrate a fine trickle of the dye through an almost completely thrombosed splenic vein in a young male patient with cirrhosis of the liver. The pathology was subsequently confirmed at operation. Fig. 6 was taken in a case of carcinoma of the stomach with secondary deposits in the portal fissure. The abrupt cessation of the flow of diiodone along the splenic vein confirmed an extrahepatic block. Similar pictures were obtained in a patient with advanced carcinoma of the head of the pancreas.

Discussion

We have found intrasplenic portal venography a useful help in the diagnosis of splenomegaly of unknown origin, in the differentiation of intrahepatic and extrahepatic venous block, and in the assessment of the degree of portal hypertension and the anatomy of the anastomosis between the splenic vein and gastric and oesophageal vessels.

The technique presents no difficulties in cases with enlarged spleens, in contrast to injections into normal

FIG. 5.—Severe degree of portal hypertension.

FIG. 3.—Melanoblastoma of liver.

FIG. 6.—Carcinoma of stomach with secondary deposits in portal fissure.

FIG. 4.—Portal hypertension.

spleens, when failure to enter the splenic tissue on account of the mobility of the organ is frequently to be expected.

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