

to all those physicians who gave me information and allowed me to examine patients under their care.

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## Medical Memoranda

### Hepatic Artery Aneurysm after Staphylococcal Endocarditis

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Mycotic aneurysms of hepatic arteries are a recognized though rare complication of bacterial endocarditis (Stengel and Wolferth, 1923). We here report the case of a woman with mitral incompetence who, after staphylococcal endocarditis, developed intrahepatic aneurysms of branches of the right and left hepatic arteries.

#### CASE REPORT

On 20 April 1967 a 40-year-old housewife known to have mitral incompetence was admitted to hospital after a small haematemesis. Clinical and barium-meal examinations were negative. She was thought to have developed an acute gastric erosion and was discharged on antacids.

In 1961 and in February 1967 she had been successfully treated with antibiotics for acute staphylococcal endocarditis with peripheral embolic features, including, on the second occasion, splinter haemorrhages and a left homonymous hemianopia.

During the next two months she began to have increasingly frequent episodes of upper abdominal pain, sometimes with haematemesis, melaena, and passage of dark urine. These led to her readmission as an emergency case on 22 June.

On abdominal examination the only abnormality was marked epigastric tenderness. A repeat barium-meal examination and gastroscopy showed no lesion, but she continued to have abdominal pain and melaena. After two days her gall bladder became palpable and she developed transient obstructive jaundice. Intravenous cholangiography failed to outline the biliary tract.

Laparotomy was performed (by J. T. R.) on 30 June. The gall bladder and common bile duct were found to be distended with blood clot. The hepatic arteries and the other abdominal viscera (including stomach and duodenum, which were opened) were normal. No lesion or active bleeding was found in the biliary tract following exploration and operative cholangiography. The gall bladder was excised and the common duct drained with a T tube. Because of the patient's poor condition the operation was then terminated.

A coeliac angiogram, performed four days later, showed an aneurysm, 2.5 cm. by 8 mm., arising from a branch of the right

hepatic artery (see Fig. 1). A second laparotomy was therefore carried out by Miss D. Nightingale on 13 July.

The right and left hepatic arteries were found to arise from a common trunk just above the first part of the duodenum. A study of the preoperative coeliac angiogram suggested that the larger and more posterior vessel was the right hepatic. This vessel was cannulated and its distribution to the right lobe of liver was confirmed by operative angiography. It was then triply ligated in continuity, the middle ligature transfixing the artery. The abdomen was closed, leaving the T tube in situ.

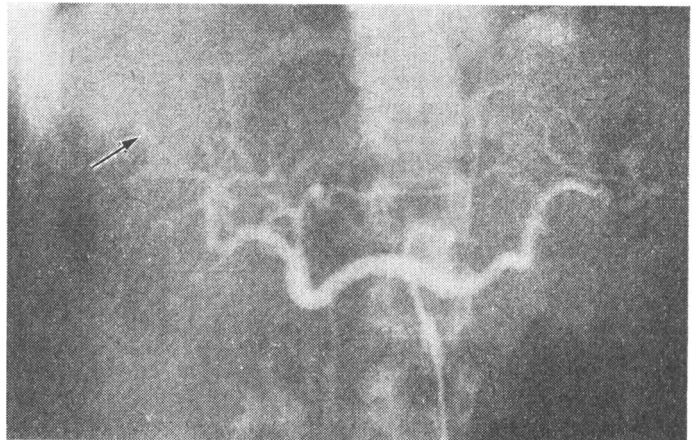


Fig. 1—Coeliac arteriogram showing aneurysm of a branch of the right hepatic artery (arrowed), 4 July 1967.

Her postoperative course was uneventful. The T tube drained clear bile. There was a slight rise in the serum bilirubin, a fall in the previously raised alkaline phosphatase, and slightly delayed bromsulphalein excretion but no other significant changes in her liver-function tests. A liver scan on 3 August was normal. On discharge on 6 August she was well and had had no further abdominal pain.

During the next six weeks altered blood was discharged from the wound on several occasions and she required blood transfusions. There was no further gastrointestinal bleeding.

Her last admission was on 17 September, and the wound sinus closed shortly afterwards. At that time her liver-function tests (see Table) and her bleeding-time and clotting-time were normal. A further coeliac angiogram on 22 September showed a small

aneurysm of a branch of the left hepatic artery (see Figs. 2 and 3). There was no filling of the right hepatic artery or of the original aneurysm.

She was well when seen on 8 April 1968.

### DISCUSSION

Hepatic artery aneurysms are rare, some 200 cases having been reported in the literature. This diagnosis should nevertheless be considered in patients with abdominal pain and

#### Liver-function Tests and Haemoglobin Before and After Operation

	Preop. Day	Postoperative				
		Day 1	Day 4	Day 6	2 Months	7 Months
Serum bilirubin (mg./100 ml.) .. ..	0.6	1.3	1.2	0.8	0.2	0.2
Direct acting .. ..	+	+	+	+	0	0
Alkaline phosphatase (K.A. units/100 ml.)	24.0	15.5	22.0	25.5	8.5	8.0
Plasma aspartate transferase (Karmen units min./ml.) .. ..	16	21	12	—	16	15
Total serum proteins (g./100 ml.) .. ..	8.2	—	7.7	7.7	8.2	9.5
Serum albumin (g./100 ml.) .. ..	3.0	—	2.7	2.8	—	—
Serum globulins (g./100 ml.) .. ..	5.2	—	5.0	4.9	—	—
Prothrombin ratio .. ..	1.1	1.1	1.2	1.4	—	—
Fasting blood sugar (mg./100 ml.) .. ..	116	104	114	108	—	—
Plasma urea (mg./100 ml.) .. ..	18	32	26	—	—	—
Haemoglobin (%) .. ..	116	91	—	88	69	—

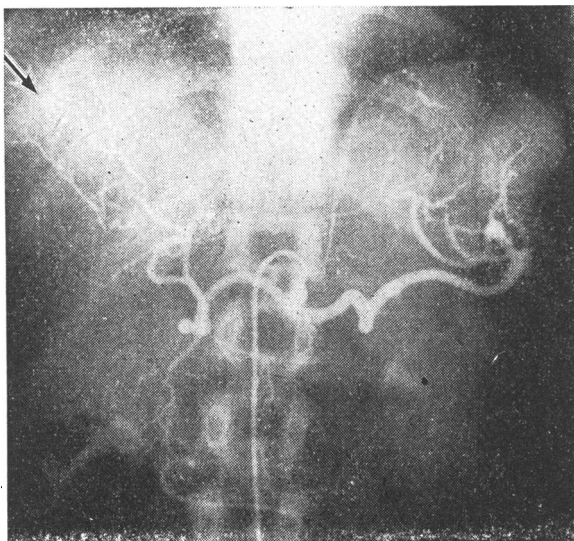


FIG. 2.—Coeliac arteriogram showing aneurysm of a branch of the left hepatic artery (arrowed) and no filling of previous aneurysm or of the right hepatic artery, 22 September 1967.

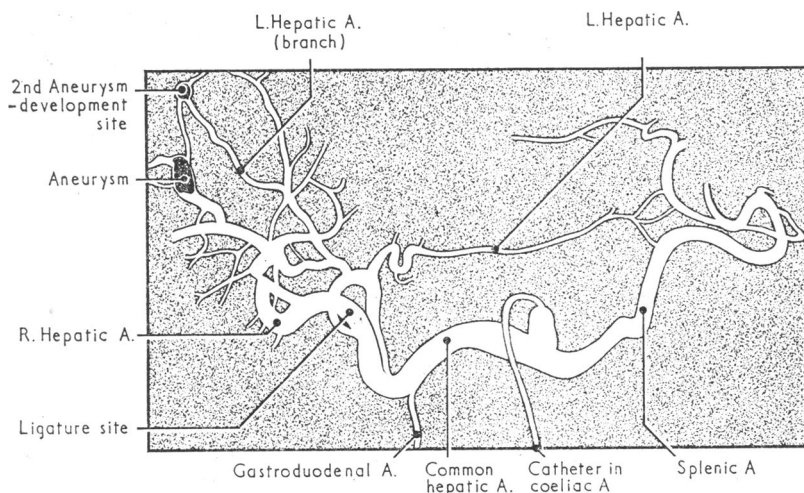


FIG. 3—Key to coeliac arteriograms.

gastrointestinal bleeding when routine investigations fail to find the source. This is especially so when there is jaundice or a known predisposing factor such as septicaemia, bacterial endocarditis, arteriosclerosis, hereditary telangiectasia, gall-bladder disease, trauma, or previous biliary surgery (Malloy and Jason, 1942; Condon *et al.*, 1967). Retrograde angiography (Kirklin *et al.*, 1955) is essential in all suspected cases, as one-third of such aneurysms are intrahepatic and can be diagnosed only by this method. The two possible operative procedures for intrahepatic aneurysms are ligation of the hepatic artery to the affected lobe or partial hepatectomy.

Several accounts of ligation of the common hepatic artery have been published (Kehr, 1903; Guida and Moore, 1966). Less frequently the right hepatic artery has been tied for aneurysms involving this vessel or its branches (Mackay and Page, 1959).

A much-feared result of hepatic arterial ligation is liver ischaemia leading to necrosis and infection with anaerobic organisms. Areas of infarcted liver (Kehr, 1903; Brunshwig and Clark, 1941) and transient jaundice (Quattlebaum, 1954) have been reported, but death from liver failure has been infrequent (Reinhoff and Woods, 1953). Moreover, infection has not been a problem since the introduction of antibiotic cover following the discovery of its beneficial effect in dogs with common hepatic artery occlusion (Markowitz *et al.*, 1949).

Bleeding is a complication (often fatal) which may occur after proximal ligation of a hepatic artery for aneurysm, and is due to collateral circulation to the aneurysm or, more rarely, to the presence of other aneurysms. Fear of this has led to the more radical operation of partial hepatectomy where the aneurysm is intrahepatic (Cohen *et al.*, 1966). This procedure, however, carries an appreciable mortality (Chan, 1967).

In our patient ligation of the right hepatic artery has so far proved to be a wise choice of treatment. No significant liver damage ensued, and though further bleeding did occur it did not seem to arise from the original aneurysm. Its source remains problematical, but the clinical picture suggests late discharge of a postoperative haematoma rather than bleeding from another aneurysm.

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