Extrahepatic portal hypertension: long-term results of surgical treatment

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Summary
Long-term results of surgical treatment were analysed in 42 patients with extrahepatic portal hypertension treated in the Department of Surgery, Institute of Haematology in Warsaw in the period 1971–1987. In all, 71 operations were carried out, and 20 patients were treated by endoscopic sclerotherapy of oesophageal varices. Recurrence of haemorrhage was found in 6 out of 11 patients (54%) after venous shunting, in 13 out of 17 patients (76%) after treatment by ligation of oesophageal varices and in 32 out of 35 patients (91%) after splenectomy. Following repeated sclerotherapy of oesophageal varices, recurrence of haemorrhage occurred in 3 out of 20 patients (15%). During 17 years four deaths occurred (10%) none of which was due to haemorrhage from oesophageal varices. The authors conclude that the method of repeated sclerotherapy is presently the most effective way of preventing haemorrhage from oesophageal varices and consider this form of management as the treatment of choice in patients with extrahepatic portal hypertension.

Introduction
Extrahepatic portal venous obstruction is the most frequent cause of portal hypertension in children. Among adults, patients with this form of the disease account for 9% of all treated cases of portal hypertension (1). Patients usually present with bleeding from oesophageal varices, splenomegaly or hypersplenism. Bleeding from varices is still a serious problem, although the post-bleeding prognosis is better in patients with extrahepatic portal hypertension than in those with cirrhosis. Many surgical methods have been proposed for control of haemorrhage and prevention of its recurrence. The purpose of the present study was to evaluate the long-term results of various surgical procedures in patients with extrahepatic portal hypertension, with particular reference to the effectiveness of operation and long-term complications. The analysis was carried out in 1988.

Material and methods
Between January 1971 and December 1987, 42 patients (25 women and 17 men) were treated for portal hypertension caused by extrahepatic portal venous obstruction in the Department of Surgery of the Institute of Haematology in Warsaw. Patients with splenic vein thrombosis were excluded. All patients had been referred to the centre from various hospitals for management of bleeding oesophageal varices after a recent massive haemorrhage. Most of them had already been operated on at referring hospitals. For evaluation of late results of surgical treatment all surviving patients were summoned for follow-up examination in 1988, including careful history taking, laboratory and physical examination, oesophagoscopy and radiological examination of the oesophagus.

The aetiology of portal vein thrombosis was established in 15 patients (36%). Causes included neonatal omphalitis in eight cases, sepsicaemia in five cases and exchange transfusion in the first days of life in two cases. In all patients the diagnosis was confirmed by angiographic methods; in addition, in 22 cases ultrasonography of the portal vein was carried out. In all cases histological examination of liver sections or needle biopsy specimens was carried out. In 39 patients normal liver structure was found, and in three cases presinusoidal fibrosis associated with normal liver architecture was diagnosed. All patients, except one, had had bleeding from the oesophageal varices (1–17 episodes).

Forty-one out of the 42 patients underwent operation. One patient was treated exclusively with sclerotherapy of oesophageal varices. In the remaining 41 patients a total of 71 operations was carried out. Forty-five of these operations, mainly splenectomies, were performed at referring hospitals before admission to the centre.

In 19 patients only one operation was performed; in 15 cases two operations; in six cases three operations and in one case four operations. Moreover, in 20 patients, repeated endoscopic injection sclerotherapy of oesophageal varices was carried out for recurrent haemorrhage. In all, 138 sclerosing procedures were performed (mean 6.9 per patient, range 3–17). The principles of sclerotherapy were the subject of a separate publication (2).
Results

Operations

Details concerning the patients treated surgically are presented in Table I.

Outcome (Table II)

Seven mesocaval shunts were performed. In four of these patients followed up between 16 and 32 years (mean 22.7 years) no recurrence of haemorrhage occurred and endoscopic examination failed to demonstrate any varices. In three patients bleeding recurred from 1 month to 3 years (mean 1.4 years). Two patients demonstrated symptoms of chronic venous stasis in the lower extremities, one of them developing deep venous thrombosis of the left lower limb. Another patient had had several episodes of bleeding from haemorrhoidal varices and underwent two operations to arrest bleeding from them.

Table I: Treatment of 42 patients with extrahepatic portal hypertension

<table>
<thead>
<tr>
<th>Operation</th>
<th>Number of procedures</th>
<th>Male</th>
<th>Female</th>
<th>Age at operation Range</th>
<th>Sex</th>
<th>Number of patients previously operated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesocaval shunt</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>6-51</td>
<td>10.9</td>
<td>6</td>
</tr>
<tr>
<td>Splenorenal shunt</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>5-13</td>
<td>9.3</td>
<td>—</td>
</tr>
<tr>
<td>Splenectomy alone</td>
<td>35</td>
<td>13</td>
<td>22</td>
<td>2-19</td>
<td>7.8</td>
<td>1</td>
</tr>
<tr>
<td>Splenic transposition</td>
<td>1</td>
<td>—</td>
<td>1</td>
<td>8</td>
<td>8.0</td>
<td>—</td>
</tr>
<tr>
<td>Ligation of the varices</td>
<td>17</td>
<td>9</td>
<td>8</td>
<td>3-21</td>
<td>10.8</td>
<td>16</td>
</tr>
<tr>
<td>Resection of cardia</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>10-23</td>
<td>19.0</td>
<td>4</td>
</tr>
<tr>
<td>Partial gastrectomy</td>
<td>1</td>
<td>—</td>
<td>1</td>
<td>26</td>
<td>26.0</td>
<td>1</td>
</tr>
<tr>
<td>Gastric devascularisation</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>22-30</td>
<td>24.0</td>
<td>3</td>
</tr>
<tr>
<td>Sclerotherapy</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>13-29</td>
<td>20.4</td>
<td>19</td>
</tr>
</tbody>
</table>

Table II: Results of surgical treatment of patients with extrahepatic portal hypertension

<table>
<thead>
<tr>
<th>Operation</th>
<th>Number of procedures</th>
<th>Number</th>
<th>Rebleed</th>
<th>Mean time (yrs)</th>
<th>Number of reoperated patients (except sclerotherapy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesocaval shunt</td>
<td>7</td>
<td>3</td>
<td>1.4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Splenorenal shunt</td>
<td>4</td>
<td>3</td>
<td>3.6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Splenectomy alone</td>
<td>35</td>
<td>32 (91%)</td>
<td>3.1</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Splenic transposition</td>
<td>1</td>
<td>1</td>
<td>14.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ligation of the varices</td>
<td>17</td>
<td>13 (76%)</td>
<td>4.0</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Resection of cardia</td>
<td>4</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partial gastrectomy</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastric devascularisation</td>
<td>3</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sclerotherapy</td>
<td>20</td>
<td>3 (15%)</td>
<td>3.3</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

In three out of the four patients undergoing splenorenal shunt, bleeding from the oesophageal varices recurred after 1 to 7 years following the operation (mean 3.6 years). One patient followed up for 17 years had no recurrence of bleeding, and endoscopy failed to demonstrate varices. Neuropsychiatric signs of encephalopathy were not observed in any patient in whom a venous shunt had been carried out.

Splenectomy alone was performed in 35 patients. In the group of 27 patients who had haemorrhage from the oesophageal varices before the splenectomy, rebleeding developed in 25 from several days to 12 years after the operation (mean 2.8 years). In 12 of these patients rebleeding occurred within 1 year after the operation. Only two patients in this group (followed up for 16 and 22 years respectively) had no rebleeding. In the group of eight patients without bleeding before splenectomy, haemorrhage from the oesophageal varices developed from 1 month to 11 years (mean 4.5 years) in seven. Only one patient in this group had no variceal bleeding. In all, out of a total of 35 patients undergoing splenectomy rebleeding from oesophageal varices has been observed in 32 (91%).

In one patient in whom the spleen was transposed to the left pleural cavity (Turunen’s procedure), two episodes of rebleeding occurred after 14 and 19 years but were easily controlled by emergency sclerotherapy.

Transoesophageal ligation of oesophageal varices through a left thoracotomy was carried out in 17 patients and complicated by rebleeding in 13 (76%) after several days to 15 years (mean 4.0 years) following the operation. In five patients, recurrent haemorrhage developed within 1 year of the operation. Four patients followed up from 13 to 22 years (mean 17.0 years) had no haemorrhage after the operation. In two of them, however, endoscopy demonstrated small varices.

Four patients who were followed up between 15 and 25 years (mean 19.7 years) after resection of the cardia by the thoracoabdominal approach had no recurrence of bleeding, and endoscopy showed no varices. Three of these patients developed postoperative oesophageal stenosis. One patient underwent partial gastrectomy without recurrence of haemorrhage during 11 years’ follow-up. Control endoscopy showed no evidence of varices. Three patients underwent gastric devascularisation without recurrent haemorrhage during a follow-up period from 6 months to 2.5 years. Control endoscopy was normal in two, and showed small varices in one, which disappeared after sclerotherapy.

Of 20 patients in whom repeated sclerotherapy was carried out, variceal rebleeding occurred in three patients (15%), who were then subjected to gastric devascularisation. In 16 out of the remaining 17 patients, control endoscopy was normal but in one patient small varices were shown.

During 17 years of follow-up four patients died. The causes of death were massive haemorrhage from an ulcer of an oesophagogastric anastomosis (1 case), bleeding from an oesophageal ulcer developing as a complication of sclerotherapy (1 case), bleeding from colonic varices (1 case) and perforation of a duodenal ulcer (1 case).

In the surviving 38 patients subjected to control endoscopy in 1988, small oesophageal varices were found in five while no varices were shown in the remaining 33 patients.
Discussion

Frequent recurrent haemorrhages from oesophageal varices are the main complication in patients with extrahepatic portal hypertension. The reports of various authors show that the frequency and severity of these haemorrhages is greater in childhood, particularly between 10 and 15 years of age (3,4). In older patients this frequency of bleeding decreases, probably as a result of the development of a natural collateral circulation (5). These haemorrhages frequently arrest spontaneously or are controlled by medical treatment. The main indication for surgical treatment is haemorrhage which cannot be controlled by medical methods, and also frequent life-threatening massive bleeds. At present numerous operative methods are used and their effectiveness is usually estimated by their ability to arrest haemorrhage immediately or to control it for a rather short period of time. It has not been established which of these surgical methods is most effective in controlling bleeding from oesophageal varices in extrahepatic portal hypertension during longer follow-up periods, from childhood to adult life.

Unquestionably, the most universally accepted therapeutic method is a shunt operation decompressing the portal system. This should provide a venous fistula of at least 10 mm diameter which remains patent and effectively reduces the volume of blood in the portal bed. The incidence of recurrent haemorrhage is lowest in patients submitted to a mesocaval shunt. Fonkalsrud (6), summarising the results obtained by several authors, found recurrence of haemorrhage in 9 out of 45 patients (20%) treated by this method. Boles et al. (7) found recurrence of haemorrhage in only one out of eight patients, while Macdougall and Williams (8) observed them in all eight patients treated surgically. In our study, recurrence of bleeding was noted in three out of seven patients, an average of 1.4 years after the operation. A much higher incidence of recurrence is found after splenorenal shunt operations. Fonkalsrud (6) observed rebleeding in 29 out of 62 patients (47%) treated in this way, Webb and Sherlock (4) in 14 out of 20 patients, and Macdougall and Williams (8) in 9 out of 10 patients. In our study rebleeding from oesophageal varices occurred in three out of four cases.

Splenectomy alone as a surgical method for prevention of recurrent haemorrhage from oesophageal varices is unsatisfactory except in cases of isolated splenic vein thrombosis. Many authors report an exceedingly high incidence of recurrent bleeding after splenectomy (4,9). In our study recurrent haemorrhage was observed in 91% of patients after splenectomy, developing within 1 year after the operation in 50%. In our opinion, splenectomy as an isolated operation should never be carried out, since it blocks the natural collateral circulation excluding the possibility of later splenorenal shunt and can lead to severe septic complications later. If indications for splenectomy for haematological reasons are present in a patient with extrahepatic portal hypertension, we think that this operation should be combined with either a gastric devascularisation or a splenorenal shunt.

Direct operations, such as oesophageal or gastric transection, partial gastrectomy, resection of the cardia or ligation of oesophageal varices are used mainly in emergency management for variceal bleeding. Long-term results of these operations are not satisfactory. We observed recurrent haemorrhage in 13 out of 17 patients (76%) after transoesophageal ligation of varices. Other authors also report a high proportion of recurrent haemorrhage (Fonkalsrud, 92%; Cohen and Mamsour-91%) (6,9). After resection of the cardia we observed no rebleeding, but postoperative complications were serious and caused the death of one patient.

The extensive devascularisation procedure proposed by Sugiu and Futagawa (10) gives good results. In three patients the abdominal stage of this operation was carried out and was supplemented with repeated sclerotherapy of oesophageal varices. The follow-up was from 6 months to 2.5 years and showed no recurrence of haemorrhage.

The therapeutic method, used ever more widely, is endoscopic sclerotherapy. Macdougall and Williams (8) used it with good results in 17 patients. These authors found that the risk of recurrent haemorrhage in patients treated by this method was lower than after other operations. Other authors also report a high effectiveness of emergency sclerotherapy and favourable late results of repeated injections (11-13). In our centre, 20 patients were treated by repeated sclerotherapy. Rebleeding developed in only three patients (15%), and disappearance or very great reduction in the size of oesophageal varices was obtained in 16 patients. In our opinion elective repeated sclerotherapy of the oesophageal varices is currently the most effective method of prevention of recurrent haemorrhage from the varices in patients with extrahepatic portal hypertension. Along with other authors (8,11,13) we believe that this method is the treatment of choice.

References

Protection for the left index finger whilst operating on HIV positive patients

Surgeons' gloves are punctured during the course of up to 48% of operations (1), and in over one-third of these (37.5%) the puncture is to the index finger of the left hand (2). Wearing two pairs of gloves may reduce the risk of the patient's blood coming into contact with the surgeon's skin to 4.5% of operations (3), but cannot protect the surgeon from a direct stab wound by a needle.

We have found it feasible to carry out uncomplicated operations whilst wearing a thimble on the index finger of the left hand between the two pairs of gloves (we are all right-handed surgeons). If the outer glove is pierced by a needle, then the finger is protected from injury by the thimble and prevented from exposure to the patient's blood by the inner glove.

It is not difficult to modify operative technique to accommodate the thimble. During hernia repairs, for example, the position of the pubic tubercle may be identified with the middle finger of the left hand but the index finger is substituted when passing the needle (Fig. 1).

This simple technique has minimal disadvantages but offers protection to the most vulnerable part of the surgeon's hand. We recommend its selective use when operating on HIV positive and high-risk patients.

References

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