CURRENT VIEWS ON THE TREATMENT OF PORTAL HYPERTENSION

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There is no established treatment protocol for bleeding oesophageal varices on which there is universal agreement between surgeons and physicians with special interest in the subject of portal hypertension. In general, the outlook for these patients is poor irrespective of treatment and the single most important factor in determining the prognosis in the individual case, is the nature and progress of the underlying liver disease with the attendant overall hepatocyte function. This article attempts to review current views on the subject of therapy for portal hypertension and proposes a rational programme of management for these patients whch is influenced by the author's personal experience.

Classificaton of Portal Hypertension.

The various disorders associated with portal hypertension have been recently reclassified by Malt (1976) into pre-parenchymal, parenchymal and post-parenchymal blocks. The pre-parenchymal group comprises most of the entities often referred to as extra-hepatic blocks such as congenital or adult thrombosis of the portal vein. The parenchymal group includes a number of disorders which produce obstruction without hepatocellular dysfunction (Schistosomiasis, congenital hepatic fibrosis and cysts) and cirrhosis where, in addition to a parenchymal block to the liver blood flow, a varying but usually progressive state of hepatocellular decompensation is present. Cases of chronic hepatic vein obstruction (thrombosis, veno-occlusive disease, congenital diaphragm in the vena cava or heart disease) constitute the post-parenchymal group.

Emergency Treatment of Bleeding Oesophageal Varices

The essential steps necessary for these patients are — diagnosis of the bleeding site, cessation of the haemorrhage and the institution of supportive measures followed by a period of assesment of the patient once the situation is under control.

It is important to stress that not all patients with portal hypertension bleed from their varices. In some of the patients, the sources of the bleeding is a chronic duodenal ulcer and indeed the incidence of

peptic ulceration in cirrhotic patients is higher than that of the general population. Barium meal studies and, in particular, fibreoptic endoscopy are therefore required in order to establish with certainty the bleeding site. The methods available for the control of the bleeding include the administration of Pitressin, balloon tamponade and the direct injection of the bleeding varices with Sclerosant solutions.

The value of Pitressin is now established. In the author's experience, Pitressin administered intravenously in a dose of 20 units in 200 ml of saline over a period of twenty minutes, resulted in the cessation of the bleeding in 75 per cent of cases. More recently, Pitressin has been administered as an intraarterial infusion via a catheter introduced into the superior mesenteric artery using the Seldinger technique (Nusbaum **et al.**, 1968). The advantage of this method lies in the much lower dose of Pitressin required and therefore a potential reduction of possible side effects especially on the myocardium. On the other hand, it is a rather complicated technique which necessitates an in-dwelling Seldinger catheter and pump perfusion and it is therefore not without certain arterial and infective risks, which may contribute to the demise of the patient (Berardi, 1974). Indeed a recent study showed distinct disadvantages with this technique of administering Pitressin (Murray-Lyon, **et al.**, 1973) and the author has abandoned its use. It is important that the biological activity of Pitressin is assessed by the occurrence of a massive bowel action which should follow within a few minutes of its administration and which is of therapeutic benefit as the resultant melaena reduces the protein load in the intestinal lumen. Intravenous Pitressin acts by lowering the portal venous pressure and, in the author's opinion, it is still an extremely useful first-line measure in the immediate management of bleeding oesophageal varices.

Balloon tamponade is certainly effective in controlling bleeding but carries certain hazards (Bauer, 1974; Pitcher, 1971). The most commonly used tube is the Sengstaken-Blakemore tube which is best inserted lubricated, via the nasal route down to 50 centimetres. The gastric balloon is inflated with 200 mls of air and slight traction is applied after which the tube is strapped to the forehead. Only if bleeding is not controlled in this way is the oesophageal balloon inflated to about 4 millimetres of mercury. In this situation, a small nasogastric tube is also inserted into the oesphagus proximal to the inflated oesophageal balloon to prevent aspiration. The complications of balloon tamponade include erosion and further bleeding, airway occlusion and aspiration pneumonitis. With strict vigilance, the complication rate and morality from its use can be kept at acceptable low levels (10-12 per cent). In any event, deflation of the balloon should be carried out at 24 hours and, if the bleeding recurs, then emergency surgery should be seriously contemplated.

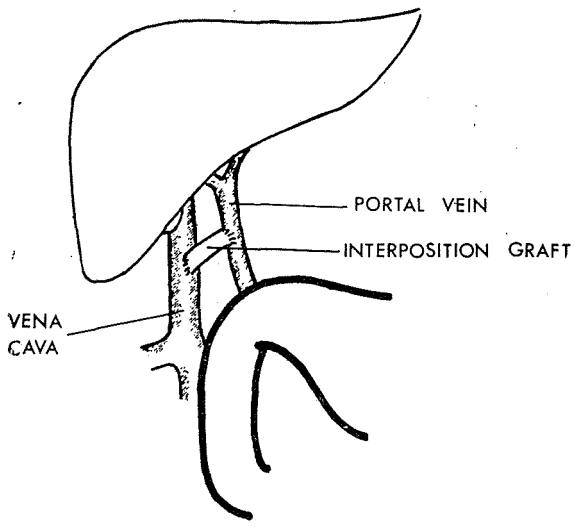

Fig. 1: Synthetic graft (Gore-Tex) between the portal vein and the inferior vena cava.

There has been a revival in recent years of the procedure of sclerosant injection of the oesphageal varices. The author has no practical experience of the technique but the best results have been reported when the technique is used after the bleeding has been controlled by gastric balloon tamponade.

TABLE 1
CLASSIFICATION OF PATIENTS WITH CIRRHOSIS (Child, 1964)

Group	A	B	C
Serum bilirubin (mg/100 ml)	<2.0	2.0—3.0	>3.0
Serum albumin (g/100 ml)	>3.5	3.0—3.5	<3.0
Ascites	None	Easily controlled	Poorly controlled
Neurological disorder	None	Minimal	Advanced "coma"
Nutrition	Excellent	Good	Poor "wasting"

Correction of hypovolaemia is best achieved by the administration of fresh blood and should be carried out with central venous pressure monitoring. In addition, these patients usually have coagulation defects due to multifactorial deficiencies which require correction by the administration of clotting factor concentrates in addition to parenteral Vitamin K.

Measures designed to prevent portosystemic encephalopathy such as the administration of neomycin or lactulose together with magnesium sulphate enemata, correction of fluid and electrolyte abnormalities (in particular hypokalaemia) and the administration of intravenous Dextrose (10 per cent) should be commenced forthwith. The level of coma is best assessed by E.E.G. monitoring.

The cessation of the bleeding episode either by vasopressin or by balloon tamponade allows of time for evaluation of the patient, with regard to his general condition, the state of his liver function and histology, the patency of his portal venous system and his blood clotting status. A decision is thereby reached using Child's criteria shown in Table 1 as to whether the patient comes into Child's category A, B or C. All Child A and some B cases are suitable for shunting should bleeding recur, whereas Child C patients are not, as their advanced liver disease imposes a prohibitive immediate post-operative mortality in excess of 50 per cent (Malt, 1976). All Child C patients should therefore have non-shunting procedures if surgery is contemplated because of continued haemorrhage. Liver histology when available, may have an important bearing on the type of surgical intervention as patients with acute hyaline change have a poor prognosis after shunting as do patients with chronic active hepatitis.

Shunt Surgery versus Long Term Conservative Medcal Treatment

In the past, a strong argument has been made for the use of prophylactic shunt operation i.e. operations performed in patients with portal hypertension and oesophageal varices before any bleeding episodes, in order to prevent the occurrence of variceal haemorrhage. However, there has now been a number of prospective randomised controlled clinical trials (Jackson et al, 1968; Resnick et al, 1969; Conn and Lindenmuth, 1965; Conn et al, 1972) which have shown that prophylactic shunt operations do not impart any real benefit to these patients but alter the cause of death from variceal haemorrhage to liver failure. Moreover, prophylactic shunt operations in fact result in a decreased survival time. These clinical trials have conclusively proved that there is no indication for prophylactic shunt surgery.

The question of a therapeutic shunt is still highly controversial. Recent controlled clinical studies comparing therapeutic shunts i.e. a shunt operation carried out after bleeding has occurred versus conservative treatment (Jackson et al, 1971; Resnick et al, 1974) have indiciated no signifi-

cant differences in survival between these two approaches. However, in these trials patients with liver disease of varying severities were lumped together and indeed in some of the studies, some of the patients that were originally allocated to the conservative treatment group were subsequently shunted. Since it is known that only patients with Child group A and some cases of Child group B do well after shunt surgery, a more valid comparison is between shunt surgery and continued conservative medical treatment in patients with good liver function. The preliminary report of Mikkelsen (1974) of patients who had bled at least once from varices and who were under 60 years of age and classified as Child Group A, has shown that medical treatment (38 patients) results in a 10 per cent five-year survival as opposed to 60 per cent five-year survival following shunt operation (37 patients).

Non-Shunting Procedures

There are a number of these operations. They include Boerema-Crile transoesophageal ligation, oesophageal transection, porto-azygous disconnection of Tanner, splenectomy and devascularisation, the Boerema-Crile button, oesophagogastrectomy etc. The one main advantage of all these procedures is the retention of a high pressure venous zone adjacent to a low pressure one and this ultimately leads to the recurrence of the varices and therefore to recurrent haemorrhage. Nevertheless, they are the operations of choice in patients with normal hepatocytes and a high portal blood flow such as patients with Schistosomiasis cavernous transformation of the portal vein if and when conservative treatment fails. The operation most favoured in this group of patients in view of the good results obtained is splenectomy and devascularisation. For patients with advanced liver disease (Child C) who continue to bleed, the author favours the oesophageal transection procedure of Walker. The immediate mortality in this group is high, and the prognosis for those that survive the operation is extremely poor. It is therefore debatable whether surgical intervention is indicated even in the presence of continued or recurrent bleeding. In the final analysis, the decision of whether or not to operate is based chiefly on moral grounds.

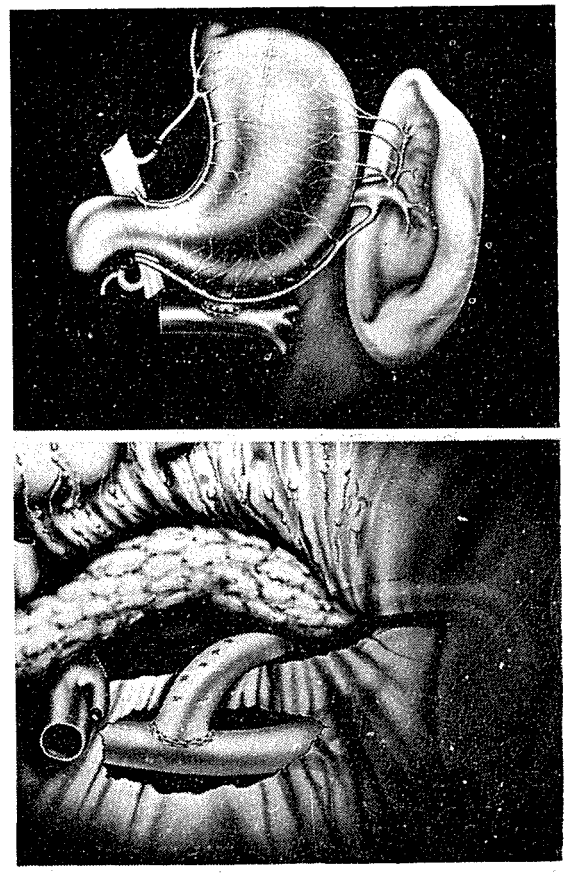

Fig. 2: Warrent Shunt. (Top) shows the completed procedure with the relevant anatomy. (Bottom) Details the anastomosis between the splenic vein and the renal vein.

Shunt Operations

The various types of shunt operations are shown in Table 2. The most established operation and the one that is often used as the yardstick against which all other shunt procedures are compared, is the portacaval shunt. The end-to-side portacaval shunt has been favoured by most surgeons in preference to the side-to-side variety largely because of technical considerations. On haemodynamic grounds of course the side-to-side portacaval shunt is a better procedure and is the operation

TABLE 2
SOME OF THE MORE POPULAR SHUNT OPERATIONS

I. Portasystemic shunts —
   A. Portacaval: end-to-side
      side-to-side
      interposition (H) graft
   B. Splenorenal.
   C. Mesocaval: end-to-side
      interposition (H) graft
   D. "Makeshift".

II. Shunts causing selective decompression.
   A. Warren's trans-splenic decompression.
   B. Left gastric — vena caval shunt.

of choice in the presence of ascites and reversed portal blood flow. However, it is technically very difficult and has a higher thrombosis rate than the end-to-side portacaval shunt. The more recent inter-position graft procedure between either the portal vein and the vena cava (author's preference) or between the superior mesenteric vein and the vena cava is, in fact, a type of side-to-side anastomosis which can be performed with relative ease and avoids the risk of tenting of the vessels and therefore of late thrombosis of the shunt. The author now tends to favour a portacaval shunt using an interposed synthetic (Gore-Tex) graft anastomosed end-to-side to the inferior vena cava and the portal vein as shown in Figure 1.

The concept of selective decompression of the portal venous system whereby the pressure at the site of the offending oesophageal varices is reduced but the portal blood flow is not affected to any great extent is an attractive one. However, it is not based on any scientifically proven premise that retention of the portal venous blood in such patients is the important factor in determining whether or not deterioration of liver function and encephalopathy occur after shunt surgery. Not infrequently, in patients with portal hypertension, effective portal flow through the liver is greatly reduced and in some the flow in the portal vein is reversed. The operation that has been most extensively investigated as a selective decompression procedure is that described by Warren et al (1974) and shown in Figure 2. Another type of selective shunt is that described by Japanese workers (Inokuchi et al, 1975) which consists of an anastomosis between the left gastric coronary vein and the inferior vena cava using an interposed saphenous vein graft. The author has obtained good results with the Warren procedure but the operation is technically very difficult and had to be abandoned in 3 out of 12 patients. It is also highly debatable whether one needs to devascularise the stomach after the completion of the distal splenorenal shunt as recommended by Warren et al.

In patients with portal hypertension in whom hepatocyte function is normal, e.g. Schistosomiasis and cavernous transformation of the portal vein, non-shunting operations should be performed in the first instance. Severe encephalopathy will almost certainly develop after any form of portacaval shunt but is less likely after a splenorenal shunt; so that this becomes the shunt operation of choice in these patients should bleeding recur after a non-shunting procedure.

The complications of shunt operations include recurrence of haemorrhage and encephalopathy. Recurrence of haemorrhage after shunt operation is the result of thrombosis of the shunt; and, in general, the recurrent haemorrhage rate after a portacaval shunt is of the order of three to five per cent. Encephalopathy is a problem. A recent randomised but not blind study has shown that the incidence of encephalopathy in patients with alcoholic cirrhosis is doubled in little over four years even without a shunt, whereas after portacaval shunt, the incidence during the same period increased from 20 to 53 per cent. The difference between these two groups was not significant (Mutchnick et al, 1974). However, the incidence of acute encephalopathy after shunting is more than twice as common as in the non-shunted group and the difference was significant. In general, the incidence and severity of encephalopathy is less after a splenorenal than a portacaval shunt. The incidence of encephalopathy is also low after the selective decompression procedures.

Conclusion

It is now generally accepted that patients with pre-parenchymal blocks and parenchymal blocks with normal hepatocyte function are best treated in the first instance by non-surgical measures. Cirrhotic patients with varices who have not bled should not be treated surgically. In the presence of bleeding varices in these patients, the choice of treatment is dictated by the overall general condition and the liver funcion together with the details of the histology of the liver. In good risk patients (Child A and some Child B) the evidence available suggests that a therapeutic shunt is probably the best form of treatment in that it is accompanied by a low immediate mortality and a five-year survival rate of about 60 per cent. On the other hand, the patients with more advanced liver disease and with poor general condition should not, in the first instance, be treated surgically. In the presence of recurrence or continuance of the haemorrhage in this group of patients, then a difficult decision has to be made. On moral grounds alone, very often one has to resort to emergency surgery which should take the form of a non-shunting procedure. The ultimate prognosis of these patients is of course extremely poor.

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