TEN YEARS OF PORTAL SYSTEMIC SHUNTS

by

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WITH the experience of over a quarter of a century of portacaval anastomosis, it has been established that the operation prevents bleeding from oesophageal varices, but there is still some doubt as to the therapeutic value of the procedure. A number of individual randomized controlled trials have failed to demonstrate that either prophylactic or therapeutic portacaval shunt significantly prolong life. However, if one combines the results of these trials, then the superior survival of the shunted patient becomes significant (Conn, 1974). Although the quantity of life may be greater, it is possible that the quality may not. Certainly, the risk of recurrent haemorrhage is almost eliminated, but the incidence and severity of portal systemic encephalopathy is undoubtedly increased. The mode of dying is changed from one of terrifying torrential haemorrhage to one of drowsy drifting into delirium. In a small community like Northern Ireland, with relatively few patients with bleeding varices, a prospective controlled trial is impractical, but some useful information can be obtained from a retrospective study. This paper presents the results of a small personal series of shunt operations over the ten year period ending December 1976.

PATIENT SURVEY

During the ten years reviewed, 58 shunts were carried out in 55 patients, of whom 28 were male and 27 female. All patients have been followed up to the time of death, or until the completion of this study, and of the survivors, only three patients have been shunted for less than one year. Forty-six patients with intra-hepatic block due to cirrhosis, had a total of 48 shunts, and the other nine patients with extra-hepatic aetiology had 10 shunts (Table 1). It is proposed to look at these two very different groups of patients separately.

| Block          | Patients | End-to-Side | Conventional | Distal | Mesenterico-Caval |
|----------------|----------|-------------|--------------|--------|-------------------|
| Intrahepatic   | 46       | 38          | 5            | 4      | 1                 |
| Extrahepatic   | 9        | 1           | 9            |        |                   |
|                | 55       | 58          |              |        |                   |

CIRRHOTIC GROUP

All 46 patients had needle or wedge biopsy of the liver, demonstrating macro-nodular cirrhosis in 23, micro-nodular cirrhosis in 19, secondary biliary cirrhosis
in 3, and Wilson's Disease in 1. In 14 patients, alcohol was considered the aetiological factor; chronic active hepatitis was proven in 6 others, but was probably the primary aetiology in many more. Three patients had associated sarcoidosis of the liver, and in one, it appeared to be the main aetiological factor in the production of the portal hypertension.

The mean age at the time of shunt was 48, with a range of 13-69 years. All patients had bled from their varices on one to six occasions prior to shunt (mean 2.3). In almost half the patients, the acute haemorrhage had been controlled by injection therapy initially, the shunt being carried out at a later date. Of the 48 shunts, only four were carried out as urgent procedures, that is, within 48 hours of the onset of bleeding; 21 were performed within four weeks of the last haemorrhage, and the remainder at varying intervals up to one year. End-to-side portacaval shunt, considered the procedure of choice, was used on 38 occasions. Conventional spleno-renal shunt was used in five, distal spleno-renal shunt in four, and H-graft mesenterico-caval shunt in one. Using Child's classification, 17 patients were Grade A, 15 patients Grade B, and 14 Grade C. There was only one operative death in the series, and this occurred in a 31 year-old Child's Grade C diabetic with jaundice and previous hepatic coma. Pre-operatively, he required over 400 units of insulin daily, and following surgery, went into irreversible ketosis.

At the time of review, only 24 of the 46 patients were still surviving, but a more meaningful figure is the five year survival of 50 per cent. The major cause of death was liver failure (Table 2). Post-shunt bleeding occurred in five patients,

| Table 2 |
|---------|
| **All Deaths 1967-1976** |
| Liver Failure | 11 |
| Haemorrhage | 3 |
| Bleeding Duodenal Ulcer |
| Blocked Conventional S/R Shunt |
| Blocked Distal S/R Shunt |
| Unrelated Causes | 6 |
| Unknown | 1 |
| Home Death |
| Post-Operative | 1 |
| Uncontrolled Ketosis |
| Total | 22 |

but in only one did it result from a blocked portacaval shunt. This patient had had organised thrombus removed from one wall of the portal vein at the time of shunt, and following rebleeding nine weeks later, a successful conventional splena-renal shunt was carried out. Two patients with conventional spleno-renal shunts rebled; one due to a proven block, subsequently successfully treated by mesenterico-caval H-graft. The other was a terminal haemorrhage in a patient with presumed block and subsequent liver failure. One patient with a distal spleno-renal shunt died from recurrent variceal haemorrhage three years after
the primary operation, but shunt patency was not investigated. In the fifth patient, fatal post-shunt bleeding was proven to be due to duodenal ulceration.

A more major morbidity was that of portal systemic encephalopathy. Of the 45 patients who survived surgery, 18 (40 per cent) had some symptoms of encephalopathy, and 10 (22 per cent) required hospital admission on this account on one or more occasions. About half of the patients who developed encephalopathy did so within six months of the shunt, and it is of interest that some of these patients appeared to develop tolerance to the state, improve clinically, and subsequently continue with their occupation. About one-quarter to one-third of Child's A and B cases developed encephalopathy, but almost two-thirds of Grade C patients were affected. Incidence of encephalopathy in the under 50 age group was low, but surprisingly, there was no difference in the incidence in the 50-60 or 60-70 age groups (Table 3). Diabetics had a particularly high incidence of encephalopathy — 5 of the 6 diabetics in the series survived surgery, and 4 developed encephalopathy.

| Table 3 |
| Encephalopathy 1967-1976 |
|--------------------------|
| CHILD'S CLASSIFICATION   |  |
| A                        | 24% (4/17) |
| B                        | 33% (5/15) |
| C                        | 64% (9/14) |
| AGE GROUP                |  |
| under 50                 | 16% (3/18) |
| 50 - 60                  | 53% (9/17) |
| 60 - 70                  | 54% (6/11) |

Of the 14 patients with alcoholic cirrhosis, 7 returned to excess alcohol consumption — a major factor in their deterioration or death.

**NON-CIRRHOTIC GROUP**

There were nine patients in the non-cirrhotic group. Eight had portal vein thrombosis of varying degree, and one had a splenic arterio-venous fistula. There were 6 males and 3 females in the group, with a mean age of 29 years (range 10 - 53). One patient with intra-hepatic portal vein thrombosis had a portacaval shunt, but at 14 months, rebleeding due to shunt thrombosis necessitated conversion to conventional spleno-renal shunt. The others had splenectomy and conventional end-to-side spleno-renal shunt. Only one patient with conventional spleno-renal shunt had further bleeding, and this occurred soon after the shunt — the patient has subsequently remained free from haemorrhage for five and a half years to the time of review. There has been no post-shunt encephalopathy, and no operative or delayed deaths in this group, now followed up for from two months to ten years.
DISCUSSION

One-half to one-third of patients with proven varices never bleed, but once the first haemorrhage occurs, approximately two-thirds will rebleed within a year, each episode carrying a high mortality. This high mortality is related not only to the effects of hypovolaemia on an already sick liver, but also to the associated circulatory, metabolic, renal and coagulation problems. Our approach has been to try and control bleeding initially by conservative or relatively minor surgical procedures, and then make every effort to improve the general clinical status of these very ill patients over the next few weeks or months prior to undertaking definitive surgery. Using oesophageal tamponade and injection therapy, one can expect to save over 80 per cent of all patients with acute variceal bleeding, and thus eliminate the need for emergency shunt. Orloff and colleagues (1974) have been strong advocates of the emergency portacaval shunt, but report a 52 per cent operative mortality, which we consider prohibitive. Unfortunately, only one-quarter to one-third of the survivors of conservative management are ever considered fit for shunt, but the shunt rejects can be satisfactorily managed by oesophageal transection using the SPTU stapling gun (Van Kemmel, 1976; Johnston, 1977). Encouraging results with this trans-abdominal method of transection have made us more selective in the patients chosen for shunt, with the result that in the last year of the review, only three patients were subjected to shunt. During the ten years reviewed, our criteria for shunting have been less strict than in many centres, in that 11 of the 46 cirrhotics (24 per cent) were aged 60 or over at the time of operation, and 14 (30 per cent) were Child’s Grade C patients. In spite of this, the operative mortality in the cirrhotic group was only 2 per cent, and the five year survival 50 per cent. It looks as though no specific perimeters can be used consistently and accurately to predict those patients who will do well with a conventional shunt (Schwartz, 1975). Hepatic function tests may indicate the chance of early survival, but do not predict the long-term outcome (Moody, 1975). In the past, I have felt that “the patient who looked well and felt well, did well”. Since Mikkelsen’s trial (1962), end-to-side portacaval shunt became the standard procedure in most centres, conventional spleno-renal shunt or mesenterico-caval shunt being reserved for the patient with portal vein block or previous surgery in the right hypochondrium. The relatively new distal spleno-renal shunt, with its selective decompression of the varices, is now challenging all other shunts because of low incidence of post-shunt encephalopathy reported (Warren et al, 1967). However, it is technically more difficult and carries a higher mortality than the other forms of shunt, and we await with interest the results of an on-going controlled trial (Salam et al, 1975). In this series, the occurrence of some degree of encephalopathy in 40 per cent of the shunted patients, with severe symptoms in 22 per cent, proved to be the main obstacle to return to full productive life. Its occurrence in four out of five diabetics, two-thirds of the Grade C patients, and over one-half of the over 50’s would encourage one to exclude these three categories in any future selection of candidates for shunt.

Other complications attributed to portacaval shunt have included duodenal ulcer, diabetes, and shunt thrombosis. Only four of the cirrhotics developed
post-shunt duodenal ulcer, and this is no more than might be expected from a sample of the general population of the same age and sex. Certainly, haemorrhage from an ulcer is poorly tolerated in these patients, and was the cause of death in one patient. The severity of symptoms in one other patient with duodenal ulcer necessitated vagotomy and drainage three years after distal spleno-renal shunt.

Diabetes is known to occur more commonly in cirrhotics than in non-cirrhotic patients, but there is no conclusive evidence that portacaval anastomosis increases the incidence (Conn, 1973). There were six diabetics in this series, but none developed diabetes subsequent to the shunt.

Thrombosis of a portacaval shunt is unusual unless there is pre-existing thrombus in the portal vein, as occurred in both our patients with post-shunt thrombosis. In the Bristol series, 8 of 10 cirrhotics who had mural thrombus removed at the time of shunt, subsequently developed thrombosis (Windle and Peacock, 1975). In retrospect, one would not advise portacaval shunt in this situation. The thrombosis rate in conventional spleno-renal shunt is generally much higher, due to the reversal of normal blood flow and the smaller vessel calibre. There were two definite and one possible shunt thrombosis in the 14 conventional spleno-renal shunts. Patients with portal vein thrombosis are said to be particularly liable to blockage of their shunts, but in this group, there was only the one possible failure just mentioned. Anyhow, where the liver function is normal and the portal hypertension extra-hepatic in origin, the prognosis is good — there were no deaths or portal systemic encephalopathy in the group during the ten year period.

SUMMARY

In the ten years reviewed, 58 portal systemic shunts were performed in 55 patients with bleeding oesophageal varices, with only one operative death. In the patients without cirrhosis, there was no encephalopathy or death. In the cirrhotic group, the incidence of post-shunt encephalopathy was high (40 per cent), and the five year survival low (50 per cent). End-to-side portacaval shunt had a five per cent thrombosis rate compared to over 20 per cent for spleno-renal shunt. Stricter criteria for shunt selection and more extensive use of transabdominal oesophageal transection for the shunt rejects is advocated.

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