Emergency Portacaval Shunt for Variceal Hemorrhage

A Prospective Study

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Emergency portacaval shunt for variceal bleeding is associated with a high operative mortality, particularly if used as a last resort. Because of this, a strong case has been made against emergency shunt. This report describes an experience with emergency portacaval shunt for the treatment of variceal bleeding when used systematically after hemodynamic stabilization and control of the bleeding episode with balloon tamponade, if necessary, in patients with mild or moderate liver disease. The population studied comprised 62 consecutive patients who rebled from varices while participating in a controlled trial of propranolol for the prevention of rebleeding. Of the 62 patients, nine died of massive hemorrhage and 53 survived the hemorrhage. Of the 53 survivors, 11 had severe liver disease and were not considered for shunt surgery. Of the remaining 42 patients with mild or moderate liver disease, 36 had emergency central portacaval shunt. The interval between endoscopic diagnosis of variceal bleeding and surgery averaged 19 ± 3 hours (mean ± SE). The operative mortality rate, defined as in-hospital mortality, was 19%. One- and 2-year survival rates were 78% and 71%, respectively. The incidence of postoperative hepatic encephalopathy was 36%; all patients responded favorably to protein restriction and lactulose. Thus, under specific conditions, emergency portacaval shunt results in an acceptable long-term survival rate. In patients with mild or moderate liver disease, emergency portacaval shunt should be considered when other forms of treatment for the prevention of variceal rebleeding have failed.

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HEMORRHAGE FROM ESOPHAGEAL VARICES is a life-threatening complication of portal hypertension in patients with cirrhosis. Among patients admitted for variceal hemorrhage, 80% will rebleed and 60% will die within 1 year.[1] In addition, the risk of rebleeding and death is much higher within the days and weeks after the initial hemorrhage, and decreases thereafter.[1,2] Thus, any substantial improvement in survival must rely on maneuvers that can be used early after the initial bleeding to prevent recurrences.

Four randomized trials of therapeutic portacaval shunt have shown no significant improvement in survival with shunting,[3] but in all four studies, randomization took place at some time, days to weeks, after presentation for bleeding, *i.e.*, beyond the period of the highest mortality. Emergency portacaval shunt has been advocated by Orloff and Bell[4] to treat cirrhotic patients with acute variceal bleed. The high operative mortality rate (40–50%) is a major deterrent to this procedure, particularly if used as a last resort.[5,6] However, patients with untreated active bleeding have comparable mortality rates,[7] and there are no controlled trials comparing emergency shunt with conservative medical therapy. Despite this lack of adequate data, a strong case has been made against emergency portacaval shunt.

Besides early recurrence, the severity of liver failure is the other major determinant of mortality rate in cirrhotic patients with variceal hemorrhage.[8] The prognosis in patients with severe liver disease is usually dismal and it seems unlikely that any therapeutic strategy can significantly improve their survival.

In this report, we describe our experience with emergency portacaval shunt in patients with variceal hemorrhage and mild to moderate liver disease. All patients were part of a negative clinical trial of propranolol, and

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data were collected prospectively at the time of variceal rebleeding. Our results suggest that under well-defined conditions, emergency portacaval shunt is a valid therapeutic alternative.

Materials and Methods

During a 3-year period, 79 adult patients admitted to Saint-Luc Hospital for variceal hemorrhage were entered into a controlled trial of propranolol for the prevention of variceal rebleeding. During an average follow-up of 692 ± 78 days (mean ± SE), 62 of 79 patients rebled. The average interval between the first bleeding episode and rebleed was 91 ± 20 days. There was no difference in the rebleeding rate between patients treated with propranolol and patients treated with placebo. Detailed results of this trial have been published elsewhere.[9] The endpoint of the trial was rebleeding from varices. In patients who rebled, drug treatment was discontinued and alternative treatments were used. We decided *a priori* that, if possible, patients who rebled and who were in good condition would have an emergency central portacaval shunt, whereas patients with severe liver disease would be treated by endoscopic sclerotherapy with intravariceal ethanolamine. However, available alternatives were explained to the patient, who made the final decision. The 62 patients who rebled form the basis of this report.

The severity of liver disease at the time of rebleeding was assessed by the Child-Turcotte classification (CTC) as modified by Di Magno et al.[10] In this modification, each of five variables (ascites, encephalopathy, serum albumin, serum bilirubin, and prothrombin time) is given a value of 1, 2, or 3 for increasing abnormality, and the values summed over the five variables for each patient. Thus, the best possible score is 5 and the worst is 15. Mild liver disease (class A) is defined as a score of 5–7, moderate liver disease (class B) as a score of 8–10, and severe liver disease (class C) as a score of 11 or greater. Bleeding was treated initially with blood transfusions as required, and balloon tamponade if necessary until definitive treatment by surgery or sclerotherapy. Surgery was performed by one of four surgeons (LD, RL, ST, and PL) experienced with portacaval shunt surgery.

The diagnosis of hepatic encephalopathy occurring during follow-up was based on clinical criteria according to Trey et al.[11] Encephalopathy was categorized as "spontaneous" (not associated with specific comagenic events) or "induced" (precipitated by gastrointestinal bleeding, drug administration, infection, *etc.*). "Spontaneous" encephalopathy was further categorized as "mild" (easily managed by diet and lactulose or neomycin, not interfering with normal life function) or "severe" (precluding normal activities of daily living).[12]

Survival curves were constructed by the Kaplan-Meier method.[13] Multivariate analysis, using the Cox proportional hazard model[14] with a stepwise procedure was performed to identify variables that had an effect on survival.

Results

The outcome of the 62 patients who rebled from varices is shown in Figure 1. Nine patients died of massive hemorrhage at the time of rebleeding: two patients died at home and seven patients died in the hospital. Of the 53 patients who survived the hemorrhage, 42 had mild or moderate liver disease (CTC class A or B) and 11 had severe (class C) liver disease (Fig. 1).

Severe Liver Disease Group

Eight of the patients with severe liver disease were treated by repeated endoscopic sclerotherapy. All died within 4 months except one patient who had an hepatic transplantation. Three patients were treated by emergency portacaval shunt surgery: two patients chose surgery rather than sclerotherapy, and one patient had shunt surgery because of repeated bleeding after sclerotherapy. All three patients died within 30 days of surgery (2 of liver failure and 1 of sepsis).

Mild or Moderate Liver Disease Group

Of 42 patients with mild or moderate liver disease at the time of rebleeding, 36 had emergency shunt surgery. Two patients had devascularization surgery instead of a shunt because of portal vein thrombosis (1 patient died of postoperative complications and the other was alive at 1 year). The remaining four patients were treated by endoscopic sclerotherapy: one patient refused surgery, one patient had portal vein thrombosis, one patient was 96 years old and had cardiac failure, and a portacaval shunt turned out to be technically impossible at laparotomy in the fourth patient. Two of these four patients were alive at 1 year.

Of the 36 patients who had emergency surgery, 35 had a terminolateral portacaval shunt and one a central splenorenal shunt. Balloon tamponade was used in a majority of patients to control the bleeding episode and obtain hemodynamic stabilization before surgery (Table 1). The interval between the endoscopic diagnosis of variceal bleeding and surgery averaged 19 ± 3 hours (mean ± SE). In five patients, surgery was delayed for more than 48 hours because of infection (N = 4) or delayed patient's consent (N = 1). The operative mortal-

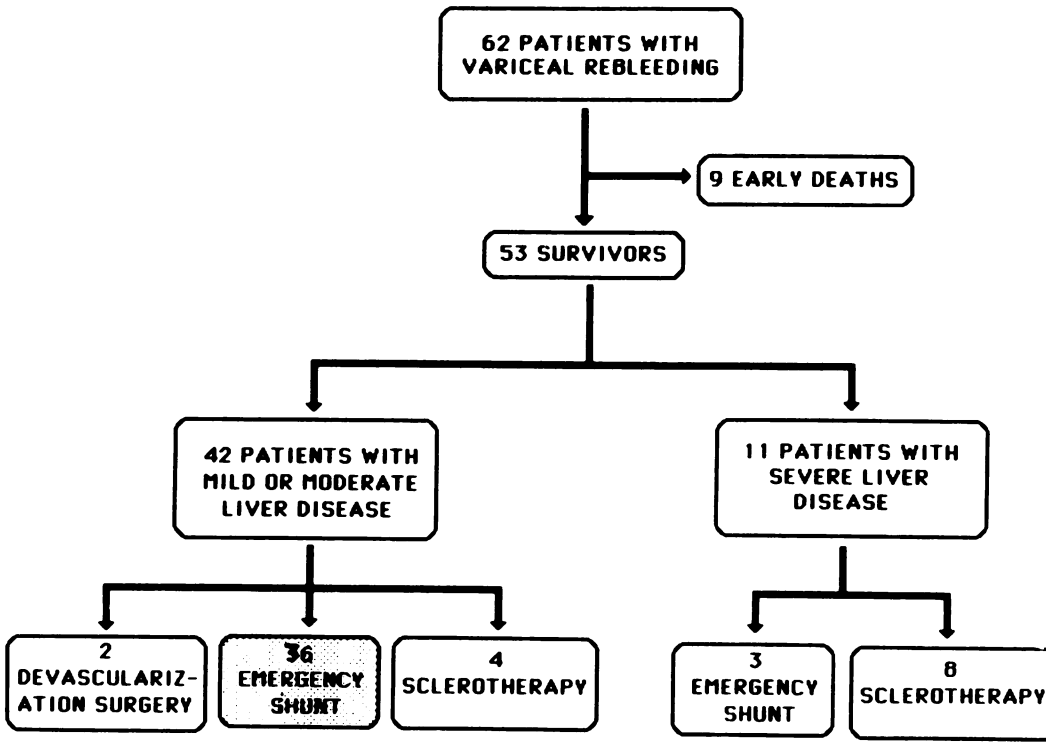

FIG. 1. Outcome in 62 patients who rebled from varices.

ity rate, defined as in-hospital mortality after surgery, was 19%: three patients died of sepsis, two patients died of liver failure, one patient died of adult respiratory distress syndrome, and one patient died of bleeding after shunt thrombosis. Hepatic encephalopathy occurred in 36% of patients (isolated "induced" episodes in 12% and "spontaneous" in 24%). Encephalopathy responded favorably to protein restriction and lactulose administration in all instances. One- and 2-year survival rates were 78% and 71%, respectively (Fig. 2).

TABLE 1. *Emergency Shunt Surgery in 36 Patients with Mild or Moderate Liver Disease*

Age (years, mean ± SE)	55 ± 2
Etiology of portal hypertension (no. of patients/%)	
Alcoholic cirrhosis	25 (69%)
Nonalcoholic cirrhosis	10 (28%)
Idiopathic portal hypertension	1 (3%)
Severity of liver disease (no. of patients/%)*	
Class A	13 (36%)
Class B	23 (64%)
No. of transfusions for bleeding episode (mean ± SE)	3.5 ± 0.6
No. of patients requiring balloon tamponade for initial control of bleed (no. of patients/%)	20 (56%)
Interval between bleeding episode and surgery (no. of patients/%)	
0–24 hours	23 (64%)
24–48 hours	8 (22%)
>48 hours	5 (14%)
Operative mortality (no. of patients/%)	7 (19%)

* According to DiMagno's modification of the Child-Turcotte classification, see text for details.

Prognostic Factors for Survival

Of the 53 patients who survived the rebleeding episode, 1- and 2-year survival rates were 60% and 56%, respectively. Prognostic variables for the duration of survival were examined by the Cox proportional hazard model. Potential variables examined included age, the severity of liver disease (CTC score), the presence of associated diseases (comorbidity), the presence of active alcoholism, the severity of the bleeding episode (number of transfusions required), and serum creatinine level. The severity of liver disease and serum creatinine level were the only variables found to be of prognostic significance ($p < 0.05$).

Discussion

Our data suggest that portacaval shunt is a valid alternative for the treatment of acute variceal hemorrhage, and that it can be applied in a majority of patients with mild or moderate liver disease, with good long-term results.

In this prospective study, we had planned to use emergency shunt in patients with mild to moderate liver

disease. Emergency shunt was not used as a desperate measure in patients who continued to bleed despite conventional treatment, but rather systematically after hemodynamic stabilization and control of the bleed with balloon tamponade. Under these conditions, the operative mortality rate was 19%. The 1-year survival rate of 78% appears comparable to that of similar patients treated by sclerotherapy.[15,16]

Portacaval shunt was highly effective in preventing further variceal hemorrhage, as only one of 36 patients rebled from varices due to thrombosis of the shunt, but the drawback was a 36% incidence of postoperative hepatic encephalopathy. In all instances, encephalopathy responded favorably to protein restriction and lactulose, but was responsible for 13 hospital admissions over a 2-year period. Endoscopic sclerotherapy is not associated with such a high incidence of encephalopathy, but patients often need to be admitted for repeated bleeding until varices are eradicated.[15,17] The extent to which encephalopathy or repeated bleeding alter the quality of life of patients has not been examined.

Our results in patients with severe liver disease were catastrophic no matter which treatment was used. The only long-term survivor was a 28-year-old patient who had an hepatic transplantation 1 month after the bleeding episode. This observation re-emphasizes that the severity of the underlying liver disease is the key determinant to prognosis in variceal hemorrhage. The ominous nature of variceal hemorrhage is also illustrated by the number of patients who died of massive hemorrhage before any therapeutic intervention could be applied (15% in this study). These patients were identified because they were part of a prospective study on rebleeding. Some of them died at home, or in the hospital before any resuscitation measures could be initiated. In other settings, such patients would not be diagnosed and included in a descriptive study of variceal hemorrhage, leading to an underestimation of mortality due to variceal bleeding.

Cello et al.[18] compared emergency shunt with endoscopic sclerotherapy in patients with severe liver disease and found no difference in short-term (1-year) survival between the two groups. A preliminary report by the same investigators also suggests that there is no difference in total health care costs between the groups.[19] In their study, patients were designated as having severe (class C) disease according to the single worst criterion for class C of the five variables measured. In our study, 25 of the 42 patients that we classified as having mild or moderate disease would have been classified as having severe liver disease according to their definition. It is therefore difficult to compare different studies because of such methodological variations.

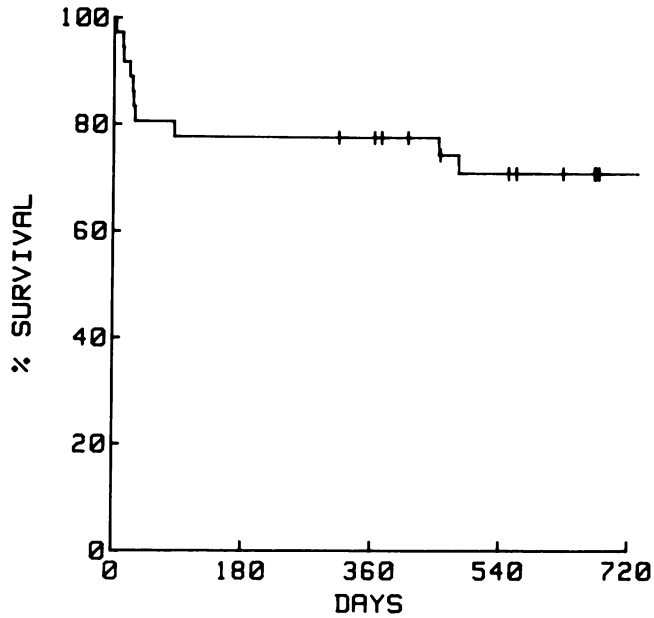

FIG. 2. Cumulative survival after emergency portacaval shunt surgery in 36 patients with mild or moderate liver disease. The short vertical bars represent trial times for patients still alive when last seen.

In summary, our data indicate that in patients with mild or moderate liver disease, emergency portacaval shunt results in an acceptable long-term survival rate. We suggest that emergency shunt surgery should be considered in such patients when other forms of treatment for the prevention of rebleeding have failed. A preliminary report by Warren et al.[20] also suggests that sclerotherapy followed by shunt surgery for sclerotherapy failure results in a significantly improved long-term survival.

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