

EMERGENCY SURGERY FOR BLEEDING OESOPHAGEAL VARICES

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ABSTRACT

Purpose of study – This case-series reviews patients who underwent emergency transgastric ligation or oesophageal transection for uncontrolled bleeding oesophageal varices despite initial conservative therapy with vasoactive drugs, balloon tamponade and injection sclerotherapy. The study seeks to identify factors determining outcome of surgery and the problems of transection surgery following endoscopic sclerotherapy.

Selection of study subjects – One hundred and ninety-eight patients (median age 54.6 years) were treated for bleeding varices between 1981 and 1991. Of these, 36 (18%) required emergency surgery and they formed the cohort under study.

Observational methods and main findings – Twenty-three patients underwent transabdominal oesophageal devascularisation and oesophageal transection while 13 had transgastric ligation. Nine patients were graded Child-Pugh's A, 20 Child-Pugh's B and 7 Child-Pugh's C – mortality was 11%, 25% and 100% respectively. Of all the risk factors, the Child-Pugh's grade was the single most important factor determining outcome (Chi-square test; 2 degrees of freedom, $p < 0.0005$). The data also showed that patients who were transfused less than 3 litres of blood had a mortality of 18% compared to 55% for those requiring 3 or more litres (Fisher's exact test $p = 0.0155$). There was no difference in mortality between transgastric ligation and oesophageal transection when patients were evaluated according to the Child-Pugh's grade. The results indicate that oesophageal transection is to be recommended for better control of bleeding (0% vs 23% post procedure) but conversely is associated with higher anastomotic leakage rate (8.7% vs 0%).

Principal conclusions – We conclude that the decision to operate on bleeding variceal patients should be made early as procrastination is detrimental to their surgical outcome. In view of the extremely poor results with Child-Pugh's C patients, emergency surgery is best offered to the Child's A and B cases.

Keywords: oesophageal varices, oesophageal transection, portosystemic shunt

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INTRODUCTION

Initial conservative measures are effective in controlling haemorrhage in the majority of patients with bleeding oesophageal varices^(1,2). However, there is a group which does not respond to medical therapy, balloon tamponade, injection sclerotherapy or variceal banding. For these 10-15% of patients, emergency surgical intervention then becomes an inevitable option.

Traditionally, surgery for oesophageal varices is directed towards lowering the portal venous pressure by a shunting operation or at interrupting variceal continuity either by direct ligation of the columns of varices or by oesophageal transection. More recently, liver transplantation has become an option for selected patients where facilities are available.

In the emergency setting when bleeding from the varices persists, it is important that an early decision is made on surgical intervention, otherwise cardiovascular decompensation adds further stress on patients who already have varying degrees of liver impairment. Procrastination leads to increased mortality and morbidity.

In this study, we review our experience with emergency surgery for controlled variceal bleeding in an attempt to prognosticate the outcome of surgery and possibly suggest

guidelines for future interventional options.

PATIENTS AND METHOD

Over an eleven-year period (1981–1991), 198 patients with bleeding oesophageal varices were admitted. Data was based on the endoscopic and operation records. All patients with upper gastrointestinal bleeding underwent diagnostic endoscopy in our unit. The case-records of 36 variceal patients who were subjected to emergency surgery for uncontrolled bleeding were analysed in detail for blood transfusion requirements, Child-Pugh's classification, type of surgery performed and postoperative morbidity and operative mortality (within 28 days of surgery).

Conservative therapy is considered to have failed if there is continuous bleeding and/or haemodynamic instability or if blood transfusions are required to maintain normotensive status after initial resuscitation, correction of coagulopathy and despite intravenous pitressin and injection sclerotherapy. Balloon tamponade was also used as an interim measure unless patients could not tolerate it or a decision to operate was already underway.

In our department, the surgical procedures include surgical interruption of the varices either by transgastric ligation (in the earlier period) or by oesophageal transection. Transgastric ligation of varices, as described by Ong GB⁽³⁾ comprises laparotomy with gastrotomy and plication of the varices by suture ligation. The technique of oesophageal transection follows closely that described by Johnston^(4,5) and comprises splenectomy, ligation of the left gastric pedicle, devascularisation of the abdominal oesophagus and upper stomach, followed by gastrotomy and transection of the oesophagus with a disposable end-to-end stapling device.

RESULTS

Of all the patients admitted with acute variceal bleeding, 162 (82%) responded to conservative therapy and were followed up with chronic injection sclerotherapy. Thirty-six patients (18%), however, required emergency surgery when bleeding could not

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be controlled.

The age of patients ranged from 17 to 87 years (mean 54.5 years). There were 22 males (61%) and 14 females (39%). Eighty percent were good-risk patients according to the Child-Pugh's classification⁽⁶⁾ (Table I). Twenty-three (64%) patients had oesophageal transection and the other thirteen (36%) were subjected to transgastric ligation (Table II).

Table I – Postoperative mortality according to Child-Pugh's grade

Classification	Number of Deaths (%)	Cause of Death
Child-Pugh's A (9 patients)	1 (11%)	Anastomotic leak
Child-Pugh's B (20 patients)	5 (25%)	Liver failure (4) Sepsis (1)
Child-Pugh's C (7 patients)	7 (100%)	Liver failure (6) Anastomotic leak (1)

Chi-square test: 2 degrees of freedom, $p < 0.0005$

Table II – Postoperative mortality in relation to operation and Child-Pugh's grade

Condition of Patients	Surgical Procedure	No. of Patients	No. of Deaths
Child-Pugh Grade A	Ligation	2	0
	Transection	7	1*
Child-Pugh Grade B	Ligation	6	2
	Transection	14	3**
Child-Pugh Grade C	Ligation	5	5
	Transection	2	2

* (Fisher's exact test $p = 0.7778$, n.s.)

** (Fisher's exact test $p = 0.3522$, n.s.)

There was significant postoperative morbidity as these patients had massive haemorrhage. Three (23%) patients rebled in the early postoperative period after transgastric ligations as compared to none in the transection group. Anastomotic leakage (8.7%) from the transection site caused death in two patients. Fairly high rates of wound infection (25%) were documented; probably the result of prolonged operation, gastrotomy spillage of gastric contents and hypovolemia (Table III).

Table III – Post-operative morbidity

Types of morbidity	No of patients
Wound infection	9
Chest infection	7
Early rebleed	3
Anastomotic leak	2
Intra-abdominal abscess	2
Burst abdomen	1

Overall postoperative mortality was 36.1%. The principal cause was liver failure while sepsis and anastomotic leakage accounted for the remaining deaths (Table I). Ninety percent of patients graded Child-Pugh's A survived compared to 75% for those with Child-Pugh's Grade B. There were no survivors in the Child-Pugh's C category. The difference was found to be statistically significant (chi-square test; $p < 0.0005$) (Table I).

Blood transfusion requirements were studied as an indicator

of the severity of bleeding. There was a strong correlation between mortality and the volume of blood transfused. It was found that patients requiring less than three litres of blood had a mortality of 18%, while 55% of patients transfused more than three litres died (Table IV).

Table IV – Survival according to extent of bleeding

	Blood transfused before surgery	
	< 3 litres	≥ 3 litres
Deaths	3	10
Survivors	15	8

Fisher's exact test $p = 0.0155$, log cross ratio – 1.83, Tail left 0.0177, right 0.9977

Seven patients (54%) died after transgastric ligation of the varices compared to six patients (26%) after oesophageal transection. It would appear that although transgastric ligation is a simpler procedure, paradoxically there is a higher mortality. However, there was actually no statistically significant difference between the two procedures when Child-Pugh's grading was taken into account (Table II).

DISCUSSION

Besides the usual vasoactive drug and balloon tamponade measures, the role of injection sclerotherapy in the successful control of bleeding is well documented^(1,2). Being a minimally invasive procedure requiring little or no sedation, it is now the procedure of choice in both emergency control of variceal bleeding (80% – 90% success)^(1,7) and long-term prophylactic treatment against subsequent re-bleeding (only 2.9% in one study)⁽⁸⁾. It is not surprising, therefore, that endoscopic sclerotherapy has emerged as the "gold standard" by which all other emergency procedures for controlling variceal haemorrhage are measured⁽⁷⁾. Perhaps, the only setback is that in some surgical centres, an experienced in-house endoscopist may not be available on a 24-hour basis⁽⁸⁾. In Singapore, this problem does not arise as most surgeons are also practising endoscopists; and in our department, 82% of patients responded to the method of flexible endoscopic sclerotherapy without the use of an overtube.

However, when bleeding continues unabated, surgical intervention has to be considered. Portosystemic shunts have been performed in some centres for control of acute and recurrent bleeding, but these are associated with portosystemic encephalopathy and high mortality rates⁽⁹⁻¹¹⁾. Hence many surgeons are not convinced of the advisability of emergency shunt procedures and have previously opted for lesser ligation procedures such as transoesophageal suture ligation via the transthoracic approach described by Boerema (1949) and Crile (1950)⁽¹²⁾. Even then, the immediate post-operative mortality was about 41%⁽¹²⁾ and surgical staff were always fearful of oesophageal suture line leakage⁽¹³⁾.

Transgastric ligation by the transabdominal approach was then advocated in some centres because the procedure was technically simpler and more speedily executed^(3,14). It is performed in an operative field familiar to general surgeons who can also deal with concomitant bleeding gastric or duodenal lesions^(12,14). In Singapore, it was popular till the 1980s and the procedure was within the capability of young surgical registrars⁽¹²⁾. However, re-bleeding is a problem and an elective shunt procedure is advised^(3,12).

The introduction of mechanical stapling devices revived the popularity of oesophageal transection as interruption of variceal flow and reanastomosis of the divided oesophagus then became quicker and easier⁽⁴⁾. Most surgical centres employ the

transabdominal oesophageal stapling transection rather than the Sugiura operation which is popular in Japan and which comprises transthoracic para-oesophageal devascularisation and oesophageal transection in addition to gastric devascularisation and splenectomy⁽⁷⁾.

In this series, three patients (23%) had early rebleeding following transgastric ligation. Two of these patients responded to medical treatment but one patient required oesophageal transection for effective immediate control. Unfortunately, all three patients eventually died as a result of worsening clinical state.

Oesophageal transection was effective in the immediate control of bleeding for all our patients. The risk of anastomotic leakage, however, was a problem inherent in oesophageal transection and caused two of our deaths. Injection sclerotherapy is known to contribute to this problem. Among patients who had sclerotherapy just before transection surgery, the oesophageal wall and para-oesophageal tissue may be oedematous and this predisposes to anastomotic leakage⁽¹⁵⁾. There were 2 leaks (18.7%) in our series and both died as a result, even though one patient was a good-risk, Child-Pugh's A grade. Conversely, for those who had chronic sclerotherapy, the lower oesophagus is shrunk and fibrosed; thus making mobilisation risky and difficult.

Besides its deleterious effect on transection surgery, sclerotherapy is not as innocuous as it is generally believed - for there are not only local complications such as oesophageal ulceration, strictures and perforations but also distal complications leading to brain abscess and distal gangrene⁽¹⁵⁾.

More importantly for the hepatobiliary surgeon, it can cause extensive periaortic fibrosis and even destruction of the venous architecture and thus accounts for difficult spleno-renal shunting or portacaval shunt failures⁽¹⁵⁾.

Oesophageal transection is technically more demanding than transgastric ligation but interestingly, the operative risk was no different when the Child-Pugh's grading was taken into account. We therefore recommend oesophageal transection for better control of bleeding provided an experienced surgeon is available.

Continued variceal bleeding in these severely compromised patients is particularly undesirable. It has been well shown that transfusion requirements of survivors are significantly less than that of non-survivors⁽¹⁶⁾. Similarly, our experience showed that three times as many deaths occurred in patients requiring transfusion in excess of three litres of blood. Current available data suggest that rapid control of haemorrhage with early surgical intervention is mandatory⁽⁷⁾ to increase chances of survival, especially in Child-Pugh's A and B patients.

The Child-Pugh's grade is the single most important prognosticating factor determining outcome of surgery. The mortality rates in our series doubled from 11% for Child-Pugh's A to 25% for Child-Pugh's B patients. The dismal performance

of Child-Pugh's C patients undergoing emergency surgery is also the experience of other workers^(5,7,11,16-18).

Child-Pugh's C patients' best chance of survival lies with cessation of haemorrhage by non-surgical means. However, if bleeding persists, transjugular intrahepatic portosystemic shunt (TIPS) seems to be a promising option today⁽¹⁹⁾. Since it was performed in 1988, TIPS is associated with low mortality (<1%). The procedure is capable of reducing portal pressure by 50% and results in acceptable rates of re-bleeding (10-15%) and encephalopathy (20-30%)⁽¹⁹⁾. However, more randomised studies are required to establish the exact role and indications before it becomes standard practice. One possible role is to serve as an interim measure before liver transplantation which deals with both the problems of bleeding and encephalopathy in patients with Child-Pugh's C cirrhosis^(7,19).

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