

Surgical Treatment of Esophageal Varices in Portal Hypertension

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Abstract

Eighty-seven patients underwent surgical treatment for esophageal varices. The surgical treatment was portal-systemic shunt, thoracic esophageal transection, abdominal devascularization with splenectomy, upper gastric resection and upper gastric transection with splenectomy. The portacaval shunt is now no longer performed in Japan, because of the high frequency of postoperative encephalopathy. Thoracic esophageal transection (SUGIURA's method) appears to be effective for esophageal varices. Other direct surgical treatments would be recommended to poor risk patients depending of clinical features.

Introduction

Bleeding from ruptured esophageal varices in portal hypertension cases is very important problem in upper gastrointestinal hemorrhage. Temporary cessation of bleeding can be expected in the majority with conservative treatment. However, there are many cases which require surgical treatment due to rebleeding of esophageal varices. This paper is a report of the results of surgical treatment for esophageal varices in our department.

Patients and methods

From 1962 to 1977, 87 patients underwent surgical treatment for esophageal varices at our department. The causes of esophageal varices were liver cirrhosis in 57 (65.5%) and idiopathic portal hypertension (IPH) in 34 (34.5%). In this report, we define clinical features such as liver fibrosis, splenomegaly with hypersplenism and portal hypertension without any obvious causes as IPH.

Two types of operative methods were employed: portal-systemic shunt operations (18 patients) and direct surgery for the esophageal varices (69 patients).

The shunt operation consisted of portacaval shunts in 11 patients and splenorenal shunts in

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7 others. Six of the portacaval shunts were end-to-side anastomosis and the other 5 cases were double anastomoses, according to the methods of McDERMOTT⁷⁾.

The four types of direct surgery for the esophageal varices are as followed.

Type I: Thirty-two patients (24 liver cirrhosis and 8 IPH) underwent thoracic esophageal transection. The operation was performed according to the two-stage method of SUGIURA et al¹¹⁾; thoracic esophageal transection with paraesophageal devascularization (stage 1), followed by abdominal paraesophago-gastric devascularization with splenectomy (stage 2). Stage 1 was carried out in 17 of the 32 cases; the other 15 operations involved both stages.

Type II: Abdominal devascularization of the upper stomach and lower esophagus combined with splenectomy was performed on 21 patients (10 cirrhosis and 11 IPH). This procedure conforms a modification of HASAAB's operation⁴⁾. Truncal vagotomy and pyloroplasty were performed in addition to the original method.

Type III and IV: Upper gastric resection and esophagogastrostomy with splenectomy was performed on 5 patients, and 11 patients underwent the 4th type of direct surgery on the varices, i.e. upper gastric transection plus splenectomy. The latter operation conforms a modification of TANNER's method¹²⁾, such that the transection line was 3 cm distal to the esophagogastric junction.

Results

Table I shows the results of the portal-systemic shunts for the alleviation of esophageal varices. All deaths within 30 days after the operation were defined as operative deaths. While there was no marked difference in operative mortality among the 3 types of shunts, for all three, mortality was high in emergency operations (no survivors out of two) and lower in elective operations (12 survivors out of 16).

The results of the direct surgical treatment of esophageal varices are shown in Table II. The survival rates in emergency operations were 60% for direct surgery of Type I, stage 1; 100% for Type I, stage 1 and 2; 67% for Type II; 25% for Type III; and 0% for Type IV. In elective operations, the survival rate was 100% for all methods, except for two deaths after the esophageal transection (Type I, stage 1) and the upper gastric transection.

Mortality for each type of operation related to CHILD's classification²⁾ of the grade of hepatic

TABLE I. Portal-Systemic Shunt for Esophageal Varices

Method	No. of Patients	Surgery			
		Emergency		Elective and Prophylactic	
		Operations-Survivors		Operations-Survivors	
End-to-side portacaval shunt	6	1	0	5	4
Double portacaval shunt	5	0	0	5	4
Splenorenal shunt	7	1	0	6	4
Total	18	2	0	16	12

TABLE II. Direct Surgery on Esophageal Varices

Type of Surgery*	Total Patients	Surgery			
		Emergency		Elective	
		Patients-Survivors		Patients-Survivors	
Type I-Stage 1	17	10	6	7	6
Type I-Stages 1 and 2	15	4	4	11	11
Type II	21	6	4	15	15
Type III	5	4	1	1	1
Type IV	11	1	0	10	9

*For detailed description, see Patients and Methods

function reserve is expressed in Table III. Mortality was highest in the C category for all operative groups; there were no survivors in this category in the portal-systemic shunt group. Elective surgery resulted in lower mortality than emergency operations in all categories of all operative groups. The upper gastric resection and transection groups are not included in these data because of the small number of cases involved.

Eight patients survived 7–10 years after their portal-systemic shunt operations and 8 survived that long after thoracic esophageal transection. In the abdominal devascularization group, 5 patients survived for 5 years after the operation. These long-term survivors in each group were all from CHILD's categories A and B. There is no evidence for true differences in survival rates between the 3 operative groups.

Specific complications following the various operations are listed in Table IV. Hepatic failure occurred in 6 patients after portal-systemic shunts, in 6 esophageal transection cases, and after one upper gastric resection. No hepatic failure occurred in the patients treated by abdominal devascularization. Anastomotic leakage was noted in 2 patients following esophageal transection and 3 cases of upper gastric resection. Rebleeding from esophageal varices occurred in 3 portal-systemic shunts, in 5 esophageal transections, in 4 abdominal devascularization cases, in one upper gastric resection and in one upper gastric transection. Subphrenic abscess occurred in one patient after abdominal devascularization.

Discussion

Throughout most of the world, portal decompression is the surgical treatment of choice for portal hypertension. However, in Japan, postoperative encephalopathy seems to develop more frequently than in Western countries. A high incidence of encephalopathy (between 40 and 45%) has been reported by SUGIURA et al¹¹⁾, INOKUCHI et al⁵⁾ and GOTO⁷⁾, compared to 22 to 33% reported by others^{6,8,9,13,15)}. On the other hand, the incidence of rebleeding from esophageal varices is no higher in Japan than in other countries^{3,5-8,11,13,15)}. Because of the high frequency of encephalopathy, the portacaval shunt is now no longer performed in Japan.

However, the splenorenal shunt is still done at a few Japanese institutions. The incidence of

TABLE III. Operative and Long-Term Mortality and Child's Classification

Operation	Child's Classification	Total Patients	Emergency Surgery			Elective Surgery			Postoperative Survival (years)							
			Patients	OD*	ED**	Patients	OD	ED	1***	2	3	4	5	7	10	>10
Portal	A	8	1	1	0	7	1	1	—	—	—	—	—	2	—	3
Systemic	B	7	0	0	0	7	0	2	—	—	—	1	1	1	2	—
Shunt	C	3	1	1	0	2	2	0	—	—	—	—	—	—	—	—
Thoracic	A	15	4	0	2	11	0	0	1	8	2	—	—	—	2	—
Esophageal	B	9	7	3	1	2	0	0	1	2	—	—	—	1	1	—
Transection	C	8	3	1	0	5	1	1	—	—	—	1	1	3	—	—
Abdominal Devascularization	A	10	1	0	0	9	0	0	—	—	4	3	1	2	—	—
	B	5	1	0	0	4	0	0	—	1	—	2	1	1	—	—
	C	6	4	2	1	2	0	0	1	2	—	—	—	—	—	—

* Death within 1 month of surgery, considered operative deaths (OD)

** Death within 6 months of surgery, considered early deaths (ED)

*** This column does not include operative and early deaths

NOTE: This table does not include gastric resections and transections because of the small number of cases in those categories.

TABLE IV. Complications of Operations

Operation	Patients	Hepatic Failure	Anastomotic Leakage	Rebleeding	Subphrenic Abscess
Portal-systemic shunt	18	6 (33.3%)	—	3 (16.7%)	—
Esophageal transection	32	6 (18.8%)	2 (6.3%)	5 (15.6%)	—
Abdominal devascularization	21	—	—	4 (19.1%)	1 (4.7%)
Upper gastric resection	5	1 (20.0%)	3 (60.0%)	1 (20.0%)	—
Upper gastric transection	11	—	—	1 (9.1%)	—

encephalopathy is usually lower after splenorenal than after portacaval shunts, ranging from 5 to 23%^{3,5,7,11}). However, rebleeding after splenorenal shunt operations has been reported more frequently than after the portacaval shunt^{3,5,7,11}). This probably results from occlusion of due to narrowing splenorenal anastomosis.

Several operative methods for the direct surgical treatment of esophageal varices have been tried in Japan. The thoracic esophageal transection, modified from WALKER's method¹⁴) is the most widely used transection. Because of the high operative mortality and rebleeding rates previously reported for this method (13 to 29%)^{1,10,14}), it has not been regarded as a definitive operation in England, and transection has usually been followed by the portal systemic shunt operation. But in Japan, a very low incidence of mortality (2 to 4%) and rebleeding (4 to 6%) was reported by SUGIURA et al¹¹). Their good results may be ascribed to the fact that they added devascularization of the upper stomach and lower esophagus to the thoracic transection. This direct surgical treatment for esophageal varices is now considered the operation of choice in Japan.

The incidence of rebleeding and operative mortality after esophageal transection reported in this paper was slightly higher than that reported by other Japanese authors. One of the reasons for this is that our series included cases who were poor risks and had undergone thoracic transection only.

Some years ago, both in Western countries and Japan, division of the coronary vein plus splenectomy was the common surgical treatment for esophageal varices⁴). Although the relative high incidence of rebleeding were reported in Japan, this method was performed for poor risk patients at our department. In our series, paraesophageal devascularization along a distance of about 7 cm above the cardia was combined with the division of the coronary vein plus splenectomy.

The complete disconnection of the portal system from the esophagus is the most important point of this technique. This complete devascularization of the lower esophagus and upper

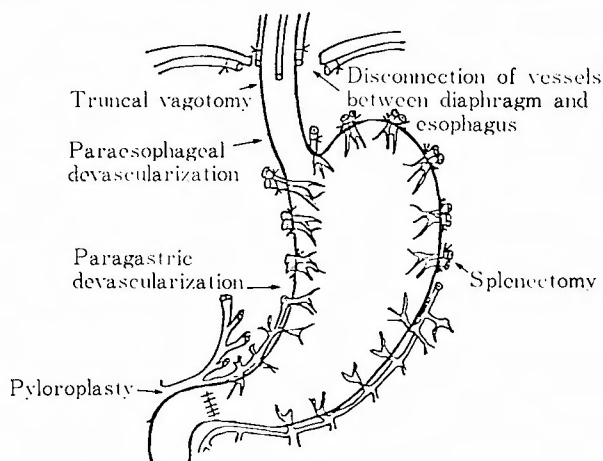


Figure 1 Abdominal Devascularization
(Paraesophageal, Paragastric Devascularization,
Splenectomy, Truncal Vagotomy and Pyloroplasty)

stomach (Fig. 1) was a satisfactory treatment in our series, except in patients with extensively developed varices. Especially in cases of IPH, it is the preferred surgical treatment for esophageal varices.

However, long-term follow-up revealed that in our series the incidence of rebleeding was slightly higher in this method compared to other methods. Therefore, thoracic esophageal transection is the method we have been using recently in patients with remaining esophageal varices after abdominal devascularization.

The gastric transection by submucosal division of blood vessels (a modification of TANNER's portal azygous disconnection¹²⁾) was performed in some cases with good results. In this method, the stomach need not be opened, and thus the potential complication of anastomotic leakage is minimized. This is the method of choice for poor risk patients who might not tolerate thoracic transection and the patients with gastric varices with hypersplenism.

Summary

During the past 16 years, 87 cases of esophageal varices with portal hypertension have been operated in our department. The causes of esophageal varices were liver cirrhosis in 57 and idiopathic portal hypertension in 34. This surgical treatment was portal systemic shunt (18 cases), thoracic esophageal transection (32 cases), abdominal devascularization with splenectomy (21 cases), upper gastric resection (5 cases) and upper gastric transection with splenectomy (11 cases).

The operative mortality was high in emergency operation of both groups of the portal systemic shunt and the direct surgical treatment. Mortality for each type of operation to Child's classification was highest in C category for all operative groups.

The main cause of operative death was hepatic failure and other causes were rebleeding and anastomotic leakage. The main cause of late death was hepatic failure.

Thoracic esophageal transection (SUGIURA's method) appears to be effective for esophageal varices. Gastric devascularization with splenectomy would be recommended to poor risk patients for esophageal varices with hypersplenism, to be followed by thoracic esophageal transection when necessary. Upper gastric transection is used for predominant gastric varices with hypersplenism.

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和文抄録

門脈圧亢進症における食道静脈瘤の外科的治療

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われわれの教室で、過去16年間に外科的治療をうけた門脈圧亢進症における食道静脈瘤の症例は87例である。そのうち、肝硬変症は57例、特発性門脈圧亢進症は34例である。

手術々式は門脈短絡術18例、開胸食道離断術32例、傍胃血行遮断および脾摘術21例、胃上部切除術5例、胃上部離断術および脾摘術11例である。

手術死亡率は門脈短絡術および食道静脈瘤に対する直達手術ともに緊急手術において高く、また Child 基準Cが各手術々式ともに不良であった。手術死因は肝

不全がもっとも多く、次いで再出血、縫合不全である。遠隔死亡の大部分は肝不全によるものである。

食道静脈瘤に対する外科的治療のうち、門脈短絡術は本邦では術後肝性脳症の合併が多く、余り実施されていない。直達手術のうちでは、開胸食道離断術がもっとも効果的である。その他の術式は症例の臨床症状により適応を決定するのがよいが、poor risk の症例には開腹による傍胃血行遮断および脾摘術が適応であり、二期的に開胸食道離断術が望ましい。また、高度の胃静脈瘤の症例には胃上部離断術が適応である。