

TRANSABDOMINAL ESOPHAGEAL STAPLING FOR CONTROL OF VARICEAL HEMORRHAGE

By

Wagih M Ghnam ⁽¹⁾, Ibrahim E Dawoud ⁽²⁾, Abd El-Azem M Ali ⁽³⁾, Osama M Shouman ⁽⁴⁾, and Talal A Amer ⁽⁵⁾.
Departments of General Surgery ^(1,2,3,4), and Diagnostic Radiology ⁽⁵⁾, Mansoura Faculty of Medicine , Mansoura University, Mansoura ,Egypt.

Variceal hemorrhage is the most dramatic presentation of portal hypertension, and its treatment is complex. This study evaluates the role of different lines of treatment for control of variceal bleeding in patients with portal hypertension.

This study was done on 45 patients with bleeding esophageal varices due to portal hypertension, classified equally into 3 groups. Group I patients treated by splenectomy and devascularisation, Group II patients treated by transabdominal esophageal stapling combined with splenectomy and devascularisation, and Group III patients treated by sclerotherapy.

Control of bleeding was achieved in patients treated by surgery in Group I and II patients, while recurrent bleeding occurred in 4 patients in Group III. No mortality was detected in Group I patients, one patient from Group I, and two patients from Group II died. RBCs and platelet counts significantly increased in Group I and II patients while no significant change was detected in Group III patients.

Esophageal transection and gastric devascularisation appears to have better survival rate, less mortality, lesser recurrent bleeding and encephalopathy over endoscopic sclerotherapy. A potential disadvantage of extensive upper abdominal surgery is that it may complicate subsequent orthotopic liver transplantation. In economic terms, sclerotherapy was the most cost effective treatment, less hospital stay, less invasive.

We conclude that the sclerotherapy is the treatment of choice in emergency control of variceal bleeding, patients unfit for surgery, recurrent bleeding after surgery, and for Pugh grade C patients. Surgical treatment is a reasonably effective approach when endoscopic sclerotherapy fails or is not indicated in unsuitable patients.

Abbreviations: Portal hypertension (PHT), Esophageal variceal sclerotherapy (EVS)

INTRODUCTION

Portal hypertension is one of the most devastating complications of chronic liver disease and is the foremost cause of mortality and morbidity in patients with cirrhosis of the liver. Conservative measures of variceal bleeding usually fail to control bleeding in 30-40% of patients ⁽¹⁾. Also about one third of patients rebleed within 6 weeks. Endoscopic esophageal variceal sclerotherapy (EVS) has been shown to be effective in controlling acute variceal bleeding. However, about 10-15% of patients fail to respond to emergency sclerotherapy and continue to bleed. In addition about 10% of patients bleed from gastric varices

after successful obliteration of esophageal varices, and are known to respond poorly to sclerotherapy ⁽²⁾. These patients require some form of surgical therapy. Apart from liver transplantation, there are two basic surgical approaches currently used in the management of esophageal varices, one is the reduction of flow through the varices by shunt surgery and the other is flow interruption by direct variceal obliteration. A careful analysis of follow up of patients treated with shunts surgery showed that such treatment did not prolong life because it increases the hepatic failure although it eliminates the risk of hemorrhage ⁽³⁾. As an alternative to these shunt surgery

techniques, several direct treatment on the varices have been proposed including, splenectomy, gastroesophageal devascularisation with ligation of the left gastric vessels (Hassab's operation) (4), and splenectomy, esophageal transection, combined with gastroesophageal devascularisation, using the abdominal approach and mechanical stapler (modified Suguira's operation) (5). Currently esophageal transection using staple gun in association with limited devascularisation is the most favored emergency operation.

Based on these conflicting results we conducted this study to evaluate the efficacy of Transabdominal esophageal stapling combined with splenectomy and gastroesophageal devascularisation and pyloroplasty (modified Suguira's operation), compared to splenectomy, gastroesophageal devascularisation with ligation of the left gastric vessels (Hassab's operation) and long term sclerotherapy.

PATIENTS AND METHODS

This study was done on 45 patients (39 males and 6 females) with age ranged 27-60 years (mean age 44.2y), with portal hypertension and bleeding esophageal varices, admitted at Mansoura University Hospital and Mansoura Emergency Hospital, in the period from Marsh 1999 to May 2001.

The patients included in this study fulfilled the criteria of at least one major episode of upper gastrointestinal hemorrhage proved to be from esophageal varices by upper GIT endoscopy. Patients above 60 years, Child C patients, or those with major cardiac, renal or chest troubles were excluded.

The patients were classified equally into three groups according to the line of management. Group I were managed by splenectomy and devascularisation (Hassab's operation), Group II were managed by Transabdominal esophageal stapling combined with splenectomy and devascularisation (modified Suguira's operation) (Fig 1), and Group III were managed by long term sclerotherapy schedule for control of variceal bleeding.

All patients were subjected to the followings:-

- (1) Thorough history and clinical examination with special attention to episodes of bleeding, jaundice, ascites, and encephalopathy.
- (2) Laboratory investigations including CBC, complete liver function, S creatinine, blood glucose, and coagulation profile.
- (3) Upper GIT endoscopy, to diagnose the presence and grade of varices, and to detect any other associated lesion.

- (4) Abdominal US, and color-coded Duplex scanning of the portal circulation. Using the B mode first, the liver and spleen were examined for size and echo texture. The portal vein and its branches were examined concerning its caliber and echo texture of its lumen. Then the color Doppler was activated for assessment of maximum velocity, mean velocity, and flow volume.

Follow up was done at regular intervals for the three groups every 3 months. The period of follow up varied from 14-26 months. For every follow up visit the previous clinical and laboratory investigations were done for all patients.

Statistical analysis: Data were analyzed using SPSS computer package and the data were presented as the mean (\pm SD). Statistical analysis of significance was carried according to the student's T-test and ANOVA test. A p value of <0.05 was considered as being significant and p value <0.01 was considered as being a highly significant.

RESULTS

Hospital stay: The range of hospital stay varied from 2-10 days (mean 4 days) in Group I, 6-29 days (mean 8.7 days) in Group II, while in Group III it varied from 2-6 days (mean 3.6 days).

Recurrent bleeding: No recurrent bleeding had occurred in Group I or Group II patients in the follow up period for at least one year, while in Group III, 4 patients developed recurrent bleeding, 3 of them was due to recurrent varices and the fourth was due to post sclerotherapy ulceration.

Encephalopathy: In Group I no case developed hepatic encephalopathy. One case In Group II, and 3 cases in Group III developed hepatic Encephalopathy.

Laboratory data: There were significant increase in RBCs and platelet counts in Group I and II in the postoperative follow up period, while no significant change was detected in Group III patients. Also there was no significant change of WBC count in all groups. Serum albumin was significantly decreased in all groups in the follow up period. No significant change in serum bilirubin in Group I and II, while it was significantly increased in Group III patients. Liver enzymes (SGOT & SGPT) was significantly elevated in all groups. No significant change in prothrombin concentration in Group I and II, while it was significantly decreased in Group III patients (table 1), (Fig 2).

Hemodynamic changes: there were significant decrease in the portal vein diameter, mean velocity, maximum velocity, and flow volume in group I and II

patients, while there was no significant change in these parameters in Group III patients (table 2).

Changes in variceal size: Upper GIT endoscopy 6 months after treatment revealed that 2 patients in Group I had recurrent varices not bleeding and not injected, one patient in Group II had recurrent varices not injected also, and 8 patients in Group III had recurrent varices that were maintained on sclerotherapy. Endoscopy one year after treatment revealed that 3 patients in Group I, and 2 patients in group II had recurrent varices but not injected, and 6 cases from Group III had recurrent varices that were maintained on sclerotherapy.

Complications: Ascites developed in 2 cases in Group I, one case in Group II, and 7 cases in Group III. *Portal vein thrombosis* occurred in 2 cases in Group I, and one case in Group II. *Chest pain and dysphagia* occurred in 3 patients in Group I and almost all patients in Group III. *Esophageal leakage* occurred in one patient in Group II (table 3).

Mortality: No mortality was detected in Group I, while in Group II, one patient died from multiple organ failure following leakage from the esophageal stapling line, and two patients died from Group III from liver cell failure.

Table (1): Laboratory Investigations Before and After Treatment In The Three Groups.

	<i>Preop (mean)</i>	<i>Group I</i>	<i>Group II</i>	<i>Group III</i>
RBCs (million/dl)	3.58	4.85	4.57	3.4
Platelets /dl	123.4	344	456	88.4
WBC/dl	8.8	7.56	7.4	8.2
S bilirubin (mg/dl)	1.15	1.08	1.4	1.68
SGOT (IU/dl)	43.3	57.7	78.2	69.8
SGPT (IU/dl)	46.7	68.06	80.6	78.26
Prothrombin conc%	80.8	78.26	77.33	67.86

Table (2): Duplex Parameters Before And After Treatment In The Three Groups.

	<i>Preop</i>	<i>Group I</i>	<i>Group II</i>	<i>Group III</i>
PVD (cm3)	1.7	1.54	1.37	1.46
Mean velocity(cm/m)	15.36	12.55	12.68	19.12
Max V(cm/m)	19.94	14.76	15	22.02
Flow vol (cm ³ /m)	1901.7	1404.5	1405.6	1998

Table (3): Complications In The Three Groups.

	<i>Group I</i>	<i>Group II</i>	<i>Group III</i>
Fever	3 (20%)	2 (13.3%)	7 (46.6%)
Chest pain	-----	-----	15 (100%)
Dysphagia	-----	3 (20%)	1 (6.67%)
Wound sepsis	1 (6.67%)	-----	-----
Esoph leakage	-----	1 (6.67%)	-----
Incisional H	-----	1 (6.67%)	-----
PV thrombosis	2 (13.3%)	1 (6.67%)	-----
Ascites	2 (13.3%)	1 (6.67%)	7 (46.6%)
Encephalopathy	-----	1 (6.67%)	3 (20%)
Rec bleeding	-----	-----	4 (26.6%)
Death	-----	1 (6.67%)	2 (13.3%)

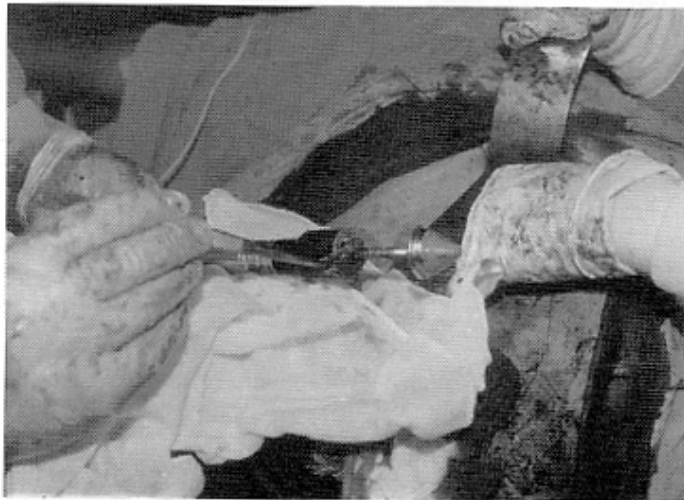
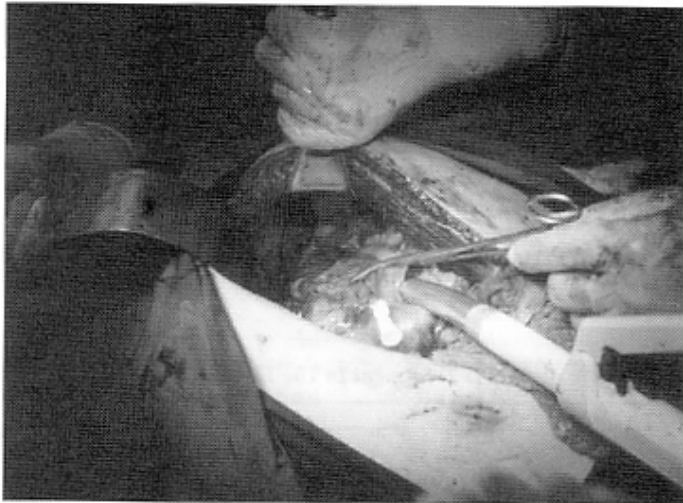
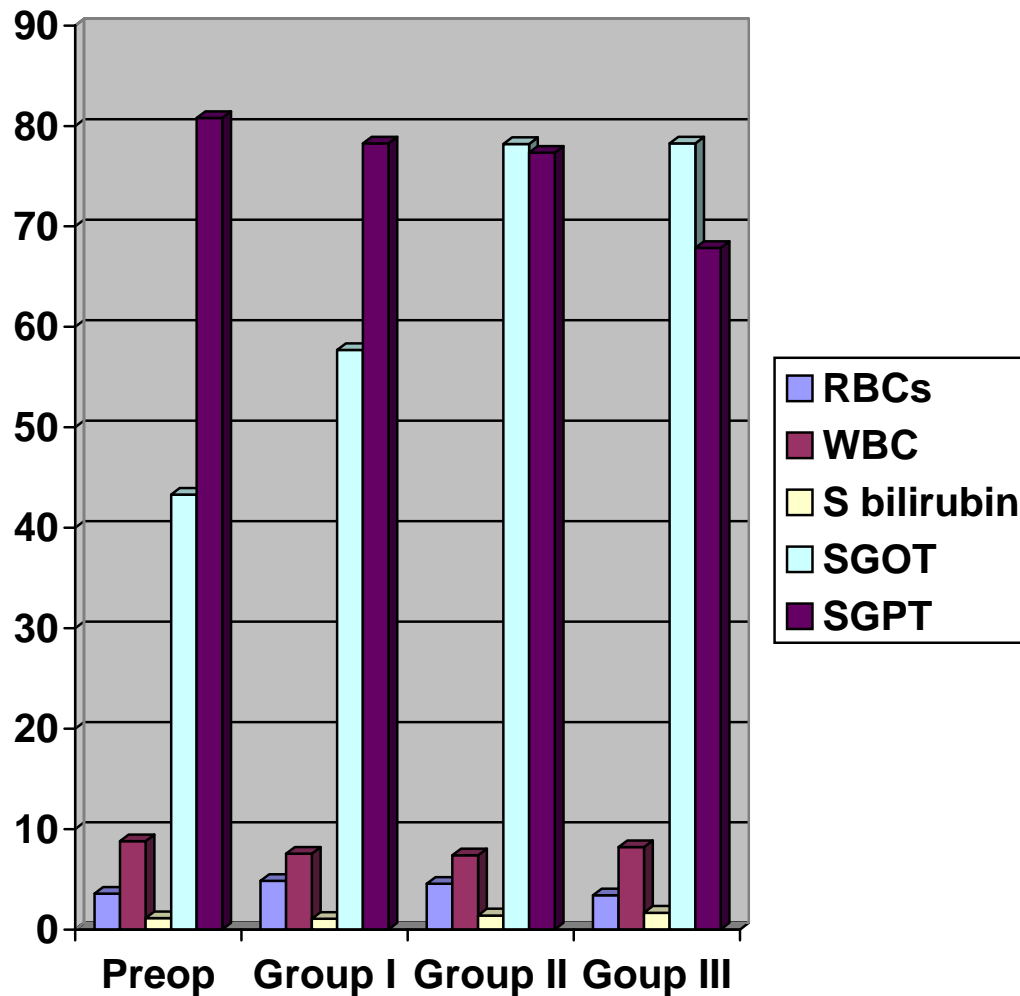


Fig (1) Transabdominal Esophageal Stapling
(a) Gastrostomy
(b) Introduction of EEA stapler
(c) Removal of the stapler

Fig (2) Laboratory Changes Before And After Treatment In The Three Groups



DISCUSSION

Variceal hemorrhage is the most dramatic presentation of portal hypertension and potentially fatal occurring in up to one third of patients with liver cirrhosis. Treatment of variceal hemorrhage is complex, because of the heterogenous nature of the population and the numerous therapies available (6).

Based on their results for management of variceal bleeding, we conducted this study to evaluate the effect of Transabdominal esophageal stapling combined with splenectomy and gastroesophageal devascularisation and pyloroplasty (modified Sugaira's operation), compared to splenectomy, gastroesophageal devascularisation with

ligation of the left gastric vessels (Hassab's operation) and long term sclerotherapy.

In our study no case reported to have recurrent bleeding in Group I and II patients in the follow up period for at least one year. Although devascularisation procedures with or without esophageal transection have been shown to be highly effective for controlling acute variceal bleeding and for reducing early variceal bleeding, significant rebleeding has been reported in some series with prolonged follow up due to recurrence of varices, it varied from 10-50% in Group I patients (7,8), and from 2.3-6% in Group II patients (9,10). Four patients reported to have recurrent bleeding in

Group III in the same follow up period. Other studies reported recurrence rate varied from 26-55% (11,12).

One case from Group II, and 3 cases from Group III developed encephalopathy. These findings mostly had no correlation with the treatment method, yet it is related to the nature and course of liver disease.

Portal vein thrombosis occurred in two patients in Group I, one patient in Group II. These results were nearly similar to that reported by Ezzat et al (7), who had 20% incidence of portal vein thrombosis after splenectomy and devascularisation. No case developed portal vein thrombosis in Group III. Eguchi (13) reported higher incidence of portal vein thrombosis in portal hypertensive patients who undergone splenectomy, they explained this phenomenon due to the decrease in the blood flow in the portal vein and relative stagnation in portal blood flow as a result of disconnection of important decongestive collaterals, and also the postsplenectomy thrombocytosis.

There was significant reduction of the portal vein diameter, mean velocity, maximum velocity and portal flow volume in Group I and II patients, with no significant change of these parameters in Group III patients. These findings were similar to that reported by Saito (14) and Takenaka (15), who explained these changes by the absent splenic vein flow contribution in the portal vein flow.

There was no mortality in Group I patients, while in Group II, one patient died because of multiple organ failure following esophageal leakage, and 2 patients died in Group III from liver cell failure. The mortality rates in other series varied widely from study to another, and from emergency to elective cases. Some studies reported that esophageal transection for acute hemorrhage is effective in controlling bleeding, however high perioperative mortality in high risk patients, and those receiving large blood transfusions was observed (16,17,18). Most authors stated that emergency transection or operation in patients with poor hepatic function is inappropriate. Early esophageal transection has been examined in a randomized controlled trial compared to sclerotherapy, revealed that no difference in 6-week mortality rate was seen (19,20). Jenkins and Shields (21) and Johnston et al (22) revealed that late esophageal transection after failed sclerotherapy is associated with an unacceptable mortality in high risk patients.

Although transection after failed sclerotherapy appears suitable for patients with Pugh grade A and B disease conventional therapy for those at high risk is unlikely to result in effective salvage and therapy may best be directed at somatostatin treatment, repeated sclerotherapy, with prolonged intermittent tamponade, or hepatic transplantation (23). Esophageal transection and gastric devascularisation appears to have better survival rate, less mortality, lesser recurrent bleeding and encephalopathy

over endoscopic sclerotherapy. A potential disadvantage of extensive upper abdominal surgery is that it may complicate subsequent orthotopic liver transplantation. In economic terms, sclerotherapy was the most cost effective treatment, less hospital stay, less invasive.

We conclude that the sclerotherapy is the treatment of choice in emergency control of variceal bleeding, patients unfit for surgery, recurrent bleeding after surgery, and for Pugh grade C patients. Surgical treatment is a reasonably effective approach when endoscopic sclerotherapy fails or is not indicated in unsuitable patients.

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