



## **Retrospective analysis of Devascularisation with/without Splenectomy for control of Variceal bleed following failure of Endotherapy/Pharmacotherapy**

Authors

**Prabhakaran R, Sathish Kumar K, Senthil Kumar P, Ravichandran R, Jeswanth S, Sugumar C.**

Institute of Surgical Gastroenterology and Liver Transplant, Govt Stanley Medical College and Hospital, Chennai, Tamilnadu, India

### **Introduction**

Endoscopic oesophageal variceal sclerotherapy (EVS) has been shown to be effective in controlling acute variceal bleeding<sup>(1)</sup>. However, about 10-15 per cent of patients fail to respond to emergency sclerotherapy and continue to bleed. In addition, about 5-10 per cent of patients with portal hypertension bleed from gastric varices after successful obliteration of oesophageal varices and are known to respond poorly to sclerotherapy<sup>(2-4)</sup>. These patients require some form of surgical devascularisation or shunt surgeries to control variceal bleed.

Routine esophago gastric devascularisation procedures are done with splenectomy both in elective and emergency setting. The role of routine splenectomy for all cases of portal hypertension with variceal bleed patients may not be required and splenectomy may infact lead to more complications.

The aim of the current study is to analyse the role of splenectomy in devascularisation procedures and the feasibility to avoid splenectomy in selected cases of portal hypertension and variceal bleed, thereby avoiding the post splenectomy complications.

### **Materials and Methods**

This study is done by retrospective analysis of all patients who underwent devascularisation with or without splenectomy between January 1999 to December 2009. Both emergency and elective devascularisation procedures were included in the study. All patients underwent extensive trans abdominal esophago gastric devascularisation without esophageal transection either as an elective or as an emergency procedure. Patients who had failure of endotherapy twice during an acute variceal bleed episodes, chronic patients who had recurrent bleed despite pharmacotherapy during follow up and on chronic endoscopic sclerotherapy, patients who cannot be put on regular follow up program were taken up for surgical devascularisation procedures and were included in the study. Patients who underwent elective shunt procedures for recurrent variceal bleed were excluded from this study. Hospital records were analysed for all demographic data like age, sex, cause for portal hypertension, site of bleed, intra operative variables like total duration of surgery, average blood loss, type of procedure done, peri and post operative complications and follow up data including rebleeding rates. These

cases were divided into two groups – group I – patients who underwent devascularisation with splenectomy and group II – patients who underwent devascularisation without splenectomy. Statistical analysis:

Mann-Whitney *U* test or *t*-tests were used to compare numerical variables, and the Chi-Square test or Fisher's exact test was carried out to compare nominal variables. Statistical analysis was done using SPSS software version 17. P value of < 0.05 is taken as statistically significant

## Results

A total of 81 patients who underwent devascularisation were analysed during the study period. The common indications for surgery were bleeding from fundal varices & emergency EST failure. Out of the 81 patients, 67 patients underwent esophago gastric devascularisation with splenectomy (Group I) and 14 patients underwent esophago gastric devascularisation without splenectomy (Group II). The demographic data between the two groups is presented in Table – 1. Both groups were comparable in terms of age, sex, etiology- whether the cause of bleed was cirrhosis or Extra hepatic portal venous obstruction (EHPVO) or Non Cirrhotic Portal Fibrosis (NCPF). Females were slightly more common in both groups with mean age in group I being 42.8 years and in group II being 38.8 years. The cause for bleeding was cirrhosis with portal hypertension in 22 cases in group I and 4 cases in group II. Cirrhosis was due to various causes like ethanol, chronic hepatitis B or C viral infection and genetic disorders in both groups and they

were comparable. 55 patients in group I and 10 patients in group II were due to non cirrhotic causes mainly EHPVO AND NCPF respectively. The site of bleeding was most commonly from esophageal varices in group II and it was almost commonly distributed between esophageal and fundal varices in group I though the values were statistically not significant. The patients in whom splenectomy was done were mostly done as an elective procedure. Both the operating time and the average blood loss were both significantly less in the patients in whom splenectomy was not done (Operating time 238 vs 140 minutes and blood loss about 610ml vs 280 ml).

Peri operative mortality (table 3) was noted in 4 cases in group I and one case in group II. Infective complications in the immediate post op period like surgical site infections, septicaemia, intra-abdominal sepsis, pulmonary complications were more commonly seen in group I patients who underwent splenectomy when compared with patients in whom spleen was preserved, though these values did not reach statistical significance. Pneumococcal and H influenza vaccination was given for all patients who underwent splenectomy either 2 weeks before surgery or within one month after splenectomy. Follow up period ranged from 4 months to 96 months with a median follow up of 38 months (table -4). There were no statistical difference between the two groups in terms of variceal re bleed, the grade of residual esophageal varices or other delayed infective complications. OPSI was not noted in any of the patients who underwent splenectomy in the follow up period.

**Table -1** Demographic Data

S.NO	DATA	GROUP I (n=67)	GROUP II(n=14)	P value
1.	Age in years(mean)	42.8 (18-70 yrs)	38.8 (11-55 yrs)	0.585
2.	Sex M:F	1:1.9	1:1.8	0.640
	<u>ETIOLOGY</u>			
3.	EHPVO	29	8	0.565
4.	NCPF	16	2	0.128
5.	Cirrhosis	22	4	0.464
	<u>Site of bleed</u>			
6.	Esophageal varices	38	10	0.078
7.	Fundal varices	29	4	0.084

**Table – 2** Intra operative variables

S.NO	DATA	GROUP I (n=67)	GROUP II(n=13)	P value
1.	Emergency surgery	17	8	0.021
2.	Elective surgery	50	6	0.016
3.	Mean operating time	238	140	0.041
4.	Average blood loss	610	280	0.018

**Table -3** Post operative complications

S.NO	DATA	GROUP I (n=67)	GROUP II(n=13)	P value
1.	PeriopMortality	4	1	0.484
2.	Early re-bleed	1	-	0.281
3.	Surgical site infection	6	2	0.282
4.	Septicaemia / intra abdominal sepsis	6	1	0.181
5.	Pulmonary complications	5	1	0.191
6.	Hepatic encephalopathy	2	1	0.381

**Table - 4** Follow up data:

S.NO	DATA	GROUP I (n=67)	GROUP II(n=13)	P value
	<u>UGI scopy:</u>			
1.	Gr –I/II varices	22	4	0.186
2.	Gr – III/IV varices	-	-	-
3.	Rebleed	6	2	0.281
4.	OPSI	-	-	-

## Discussion

Portal hypertension causes significant reduction in quality of life of patients and also portal hypertension and its consequences including variceal bleeding can cause high mortality in these patients. The incidence of portal hypertension is higher in the developing countries and is more commonly reported in the eastern countries in the world<sup>(25)</sup>. This may be due to the high incidence of hepatitis viral infection and schistosomiasis. Recurrent variceal haemorrhage and hepatic failure are common causes of death in these patients. The mortality due to first variceal bleeding can be as high as 30–50%<sup>[26]</sup>.

Currently, the safest method to treat acute bleeding from uncomplicated gastroesophageal varices is endoscopic sclerotherapy<sup>[27]</sup>. Unfortunately, this method does not reduce the bleeding risk in patients with accompanying liver cirrhosis<sup>[27]</sup>. Further, sclerotherapy is not effective for primary prevention of variceal bleeding<sup>[27]</sup>. In addition, esophagogastric variceal bleeding cannot be controlled, or relapses within 24 hours, in approximately 20% of patients with portal hypertension.

So surgical treatment options to decrease the variceal pressure or eradication of the varices becomes the treatment of choice in these situations. This is achieved by porto systemic shunt or esophago gastric devascularisation procedures respectively<sup>(28,29)</sup>. Porto systemic shunting procedures require favourable vascular anatomy and a shutable splenic vein for it to succeed. Also shunting procedures are rarely done in the emergency setup for acute variceal bleeding. So in an emergency setup and in the situations where surgical porto systemic shunts cannot be created, esophago gastric devascularisation becomes the life saving procedure for the patient.

Since inception of esophago gastric devascularisation by sugiira, the procedure has undergone many modifications<sup>(9,16,24)</sup>-so that operating time, blood loss, procedure related morbidity and mortality could be reduced. These modifications include doing a single stage abdominal esophago gastric devascularisation alone avoiding the thoracic phase, avoiding the transection of esophagus and doing extensive esophagogastric transection alone and other modifications.

Traditionally all these devascularisation procedures included splenectomy. Our study aimed to avoid splenectomy in selected cases and our results in rates of early and late rebleed and recurrence of varices were similar in patients who underwent devascularisation with or without splenectomy.

Advantages of sparing spleen are: 1) Reducing the operating time, 2) Reduces the blood loss which is very helpful in haemodynamically unstable patients, 3) Immunologically helpful in preventing rare overwhelming sepsis which carries higher mortality, 4) reduces transfusion related complications, 5) preserves the porto systemic collaterals in the peri splenic area thereby acting as a channel to decompress the portal system.

Ozocko et al<sup>(23)</sup> observed transfusion requirements and decreased incidence of post-operative portal vein thrombosis, both favouring the group without splenectomy. No differences in rebleeding, encephalopathy rate, operative time, or postoperative complications were observed between the two groups. Our study too yielded a similar result with significantly less operating time and blood loss and less transfusion requirements in patients undergoing devascularisation with spleen preservation. The immediate and delayed rebleeding rates and peri operative mortality rates were similar between the two groups. Besides the splenectomy + devascularisation group patients had higher incidence of infective complications in the post-operative period though this value was not significant.

Also for patients with EHPVO with fundal varices without hypersplenism we did spleen-preserving devascularisation in four cases. Splenectomy has been shown to result in a *definite increase in the risk of postoperative infections and septicaemia*<sup>(11)</sup>, particularly in children and adolescents. Some other studies too suggest that splenectomy can be avoided in select cases of EHPVO without hypersplenism similar to our results<sup>(5,11)</sup>.

## Conclusion

Splenectomy need not be done as a routine procedure for all cases of esophago gastric devascularisation procedure. Esophago gastric devascularisation procedure with Spleen preservation gives comparable results in selected cases to conventional devascularisation procedures with splenectomy with added advantage of decreased operative time and blood loss and a possible decrease in infective complications.

## References

1. Mathur SK, Naik SR, Supe AN, Plumber ST, Pipalia D, Bhalerao RA. Endoscopic esophageal variceal sclerotherapy using 3% aqueous phenol. *Gastrointest Endosc* 1992; 38: 152-7.
2. Trudeau W, Prindiville T. Endoscopic injection sclerosis in bleeding gastric varices. *Gastrointest Endosc* 1986; 32: 264-8.
3. Hosking SW, Johnson AG. Gastric varices: a proposed classification leading to management. *Br J Surg* 1988; 75: 195-6.
4. Mathur SK, Dalvi AN, Someshwar V, Supe AN, Ramakantan R. Endoscopic and radiological appraisal of gastric varices. *Br J Surg* 1990; 77: 432-5.
5. Spence RAJ, Johnston GW. Results in 100 consecutive patients with stapled esophageal transection for varices. *Surg Gynecol Obstet* 1985; 160: 323-9.
6. Osborne DR, Hobbs KE. The acute treatment of haemorrhage from oesophageal varices: a comparison of oesophageal transection and staple gun anastomosis with mesocaval shunt. *Br J Surg* 1981; 68: 734-7.
7. Terblanche J. The surgeon's role in the management of portal hypertension. *Ann Surg* 1989; 209: 381-95.

8. Jenkins SA, Shields R. Variceal haemorrhage after failed injection sclerotherapy: the role of emergency oesophageal transection. *Br J Surg* 1989; 76: 49-51.
9. Sugiura M, Futagawa S. Esophageal transection with paraesophagogastric devascularizations (the Sugiura procedure) in the treatment of esophageal varices. *World J Surg* 1984; 8: 673-9.
10. Koyanagi N, Iso Y, Higashi H, Kitano S, Sugimachi K. Recurrence of varices after oesophageal transection: intraoperative and postoperative assessment by endoscopy. *Br J Surg* 1988; 75: 9-11.
11. Gonzalez-Huix F, Xiol X, Sacristan B et al. Azygous portal disconnection plus oesophageal transection as the treatment of bleeding oesophageal varices: early and late results. *Journal of Clinical Nutrition and Gastroenterology* 1986; 1: 171-8
12. Langer BF, Greig PD, Taylor BR. Emergency surgical treatment of variceal hemorrhage. *SurgClin North Am* 1990; 70: 307-11 .
13. Inokuchi K. Present status of surgical treatment of esophageal varices in Japan: a nationwide survey of 3588 patients. *World J Surg* 1985; 9: 171-80.
14. Giordani M, Ravo B, Sacchi M, Smith N, Ger R. Treatment of bleeding esophageal varices by portoazygos disconnection and esophageal transection with the button of Boerema and EEA stapler: ten years' experience. *Surgery* 1985; 97: 649-52.
15. Koyama K, Takagi Y, Ouchi K, Sato T. Results of esophageal transection for esophageal varices: experience in 100 cases. *Am J Surg* 1980; 139: 204-9.
16. Dagenais M, Langer B, Taylor BR, Greig PD. Experience with radical esophago-gastric devascularization procedures (Sugiura) for variceal bleeding outside Japan. *World J Surg* 1994; 18: 222-8.
17. Umeyama K, Yoshikawa K, Yamashita T, Todo T, Satake K. Transabdominal oesophageal transection for oesophageal varices: experience in 101 patients. *Br J Surg* 1983; 70: 419-22.
18. Mir J, Ponce J, Morena E et al. Esophageal transection and paraesophagogastric devascularisation performed as an emergency measure for uncontrolled variceal bleeding. *SurgGynecolObstet* 1982; 155:868-72.
19. Burroughs AK, Hamilton G, Phillips A, Mezzanotte G, McIntyre N, Hobbs KEF. A comparison of sclerotherapy with staple transection of the esophagus for the emergency control of bleeding from esophageal varices. *N Engl J Med* 1989; 321: 857-62.
20. Mariette D, Smadja C, Borgonovo G, Grange D, Franco D. The Sugiura procedure: a prospective experience. *Surgery* 1994; 115: 282-9.
21. Fonkalsrud EW, Myers NA, Robinson MJ. Management of extrahepatic portal hypertension in children. *Ann Surg* 1974; 180: 487-93
22. Chaudhary A, Aranya RC, Devascularization following endoscopic sclerotherapy of oesophageal varices dangers and difficulties. *Br J Surg* 1991; 78: 1249-51.
23. Is Splenectomy Necessary in Devascularization Procedures for Treatment of Bleeding Portal Hypertension? Hector Orozco, MD; Miguel Angel Mercado, MD; Raul Martinez, MD; Manuel Tielve, MD; Carlos Chan, MD; Moises Vasquez, MD; Gustavo Zenteno-Guichard, MD; Juan Pablo Pantoja, MD
24. Results of a Modified Sugiura's Devascularisation in the Management of "Unshuntable" Portal Hypertension S. R. SHAH\*, S. S. NAGRAL and S. K. MATHUR.
25. Y. Wang, "Surgical treatment of portal hypertension" *Hepatobiliaryand Pancreatic Diseases International*, vol. 1, no. 2, pp.211–214, 2002

26. K. Inokuchi, K. Sugimachi, T. Sato et al.,  
“Improved survival after prophylactic  
portal nondecompression surgery  
for esophageal varices: a randomized  
clinical trial,” *Hepatology*, vol.12, no. 1,  
pp. 1–6, 1990.
27. H. R. van Buuren, M. C. Rasch, P. L.  
Batenburg et al., “Endoscopic sclero-  
therapy compared with no specific  
treatment for the primary prevention of  
bleeding from esophageal varices.  
A randomized controlled multicentre trial  
[ISRCTN03215899],” *BMC  
Gastroenterology*, vol. 3, article 22, 2003
28. F. A. Ezzat, K.M.Abu-Elmagd, M. A. Aly  
et al., “Selective shunt versus nonshunt  
surgery for management of both  
schistosomal and non schistosomal  
variceal bleeders,” *Annals of Surgery*,  
vol.212, no. 1, pp. 97–108, 1990
29. H. Cao, R. Hua, and Z. Y. Wu, “Effects of  
combined splenorenal shunt devascular-  
ization and devascularization only  
on hemodynamics of the portal venous  
system in patients with portal  
hypertension,” *Hepatobiliary and  
Pancreatic Diseases International*, vol. 4,  
no. 3, pp. 385–388, 2005.