ORIGINAL ARTICLE

COMPARISON OF SINGLE VERSES MULTIPLE SESSION BAND LIGATION FOR THE TREATMENT OF BLEEDING OESOPHAGEAL VARIES

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Background: Cirrhosis of liver is the leading cause of portal hypertension in this part of the globe. Around thirty percent of the patient with portal hypertension develops complications. Oesophageal variceal bleeding is a serious complication of portal hypertension. Oesophageal variceal band ligation (EVBL) has become the standard of care for patients with bleeding oesophageal varices. Multiple sessions of band ligation are cumbersome and expensive. **Methods:** Sixty patients with acute variceal bleed were enrolled in this randomized control trial. Patients were randomly assigned to multi-session (group A) or single session (group B) oesophageal variceal band ligation group. All patients were followed for re-bleeding and mortality up to three months. **Results:** Re-bleeding occurred (20%) in group A and (17%) in group B patients, respectively. Mortality was 10% in group A and 7% in group B patients. Variceal obliteration was better in group A 63% than group B 24% (p<0.05). **Conclusion**: Single session band ligation was comparable for rates of re-bleeding and mortality to multi-session band ligation.

Keywords: Cirrhosis of Liver, Oesophageal Varices, Band Ligation

J Ayub Med Coll Abbottabad 2015;27(1):212–5

INTRODUCTION

Hepatitis C and B virus infection is the leading cause of cirrhosis in Pakistan.[1] Cirrhosis of liver is the most common cause of portal hypertension world-wide.[2,3] Portal hypertension and its complications are amongst the leading causes of death in the world.[4] When portal pressure rises to more than 10–12 mmHg the porto-systemic collateral channels open up notably in the oesophagus and the stomach leading to the development of gastric and oesophageal varices.[5] The mortality of acute variceal bleed is at least 20%[6] and re-bleeding occurs in 40% of patients within 6 weeks of index bleeding and 75% at 1 year.[7]

Various important therapeutic options are available for the management of variceal haemorrhage including pharmacologic measures, endoscopic measures (endoscopic variceal band ligation and endoscopic injection sclerotherapy), balloon tamponade, transjugular intra-hepatic portosystemic shunts (TIPS) and emergency surgery.[8] A meta-analysis has confirmed the superiority of banding over sclerotherapy for all major outcomes, i.e., recurrent bleeding, local complications including ulceration, stricture formation, time to variceal obliteration and survival.[9,10]

Currently, most centres of the world are practicing repeated session of band ligation every 2–3 weeks till the obliteration of varices. Very little data is available regarding single session band ligation treatment for acute variceal bleed.

MATERIAL AND METHODS

This randomized control trial was carried at Department of Gastroenterology and Hepatology Shaikh Zayed Postgraduate Medical Institute, Lahore from 1st Dec 2006 to 30th Nov 2007.

All adult patients having biopsy proven or clinical, biochemical, ultrasonographic findings suggestive of liver cirrhosis and high grade recently bled oesophageal varices on endoscopy were included. Patients previously band ligated or undergone sclerotherapy were excluded.

Sixty patients meeting the study criteria were sequentially registered for study and randomly allocated by using a random number to multi-session (group A) or single session (group B) oesophageal variceal band ligation group. An informed consent was obtained from them for the technique and use of their data in research. Their demographic information (age, sex, address) were recorded. A detailed history of the symptoms, severity and duration were obtained. Base line investigations (complete blood counts, prothrombin time, activated partial prothrombin time, serum albumin, liver and renal function tests, and viral markers for hepatitis B, C and ultrasonography abdomen) were done in all patients. They were examined for the pattern and extent of varices. Both the group were given propranolol at the maximum tolerated dose. The patients were followed up for three months to record recurrence of bleeding, side effects or any complications, i.e., chest pain, dysphagia, odynophagia, stricture, oesophageal ulcer. All the information was collected through a pre-designed *pro forma*.

The data was analysed using SPSS-11. Any difference observed in the two groups were compared and tested for significance by applying Chi-square test. A *p*-value of 0.05 or less was accepted as significant.

RESULTS

Total numbers of patients were sixty; of which thirty patients were randomly assigned to group A (multi session) and thirty two group B (single session). In group A mean age was 50.80±8.14 years while in group B mean age was 50.70±8.50 and *p*-value was not significant ($p>0.05$). In group A, male to female ratio was 2.33:1 while in group B it was of 4.0:1.

In group A, there were four (13%) patients with haematemesis only, three (10%) patients with malena only and sixteen (54%) patients with both haematemesis and malena. In group B there were three (10%) patients with haematemesis only, seven (23%) patients with malena only and twenty (67%) patients with both haematemesis and malena. With regard to presenting symptoms, the two groups did not differ significantly ($p>0.05$). However, symptom of haematemesis with malena was found to be higher in comparison with two other symptoms ($p<0.05$).

Mean duration of symptoms in group A was 50.80±8.14 hours and in group B was 50.70±8.50 hours and *p*-value was not significant ($p>0.05$). At the time of presentation, in group A, eight (26%) patients had normal vital signs, seven (23%) patients had resting tachycardia, ten (33%) patients had orthostatic hypotension and five (17%) patients had supine hypotension, where as in group B, nine (30%) patients had normal vitals, eight (27%) patients had resting tachycardia, ten (33%) patients had orthostatic hypotension and three (10%) patients had supine hypotension. The differences were not statistically significant ($p>0.05$).

In group A, twenty eight (94%) patients had hepatitis C virus, one (3%) patient had hepatitis B virus and one (3%) patient had hepatitis C and hepatitis B virus co-infection. In group B, there were twenty six (86%) patients with hepatitis C virus, two (7%) patients had hepatitis B virus and two (7%) patients had hepatitis B and C virus co-infection. Hepatitis C virus was found to be higher in comparison with other causes. The difference was statistically significant ($p<0.0001$).

In group A, there were three (10%) patients in Child Pugh Class A, fourteen (47%) patients in Child Pugh Class B and thirteen (43%) patients in Child Pugh Class C. In group B, there were two (7%) patients in Child Pugh Class A, seventeen (57%) patients in Child Pugh Class B and eleven (36%) patients in Child Pugh Class C. The two groups did not differ significantly in the severity of liver disease ($p>0.05$).

On baseline endoscopy in group A, there were thirteen (43%) patients with grade 3 varices and seventeen (57%) patients had grade 4 varices. In group B, there were sixteen (53%) patients with grade 3 varices and fourteen (47%) patients had grade 4 varices. The differences were not statistically significant ($p>0.05$).

Mean number of bands applied over varices in group A were 5.3±0.6 on base line endoscopy and follow up endoscopy and banding done till obliteration of varices (grade 0–1) or end of follow up. In group B, mean number of bands applied over varices were 10.7±1.5 ($p<0.05$) and no band ligation till re-bleeding occurred. Five patients in which re-bleeding occurred were excluded from the study (Table-1).

There were no fundal varices, gastric antral vascular ectasia or duodenal erosions or ulcer in either group. During follow up, re-bleeding occurred in six (20%) group A and five (17%) group B patients, all of whom re-bleed in the first 2 weeks of follow up and belonged to Child Pugh Class C (Table-2). Both groups were comparable for re-bleeding rate. The difference was not statistically significant ($p>0.05$).

Table-1: Number of Bands applied over varices on baseline endoscopy in both groups (n=60)

Bands	Group A (n=30)		Group B (n=30)	
	Patients	Percentage	Patients	Percentage
3–4	3	10	0	0
5–6	27	90	2	7
7–8	0	0	7	23
9–10	0	0	10	33
11–12	0	0	6	20
13–14	0	0	5	17

Table-2: Follow up re-bleeding of in both groups

Follow up Visit	Re-bleeding	Group A (n=27)		Group B (n=25)	
		Patients	%	Patients	%
1st month	Yes	6	18	5	20
	No	24	89	25	100
2nd month	Yes	0	0	0	0
	No	27	100	25	100
3rd month	Yes	0	0	0	0
	No	27	100	25	100
4th month	Yes	0	0	0	0
	No	27	100	25	100
5th month	Yes	0	0	0	0
	No	27	100	25	100
6th month	Yes	0	0	0	0
	No	27	100	25	100

Total of three (10%) patients in group A and two (7%) patients in group B died in first two weeks, all due to re-bleeding. The difference was not statistically significant ($p>0.05$).

At the end of follow up, seventeen (63%) group A patients achieved variceal obliteration (grade 0–1), six (22%) patients had grade 2 and three (11%) patients had grade 3 varices. Initially in group B, eighteen (72%) out of twenty five patients achieved variceal obliteration and five (20%) had grade 2

varices and no patient was found to have grade 3 or grade 4 varices. At the end of follow up period, number of patients having obliterated varices in group B decreased from eighteen (72%) to six (24%). When both groups were compared for variceal obliteration at the end of follow up, the multi session had significantly better outcome ($p<0.01$) but initial obliteration rate is more in single session.

After the baseline variceal banding, in group A, eight (30%) patients had mild chest pain and all these eight patients had non-bleeding post banding oesophageal ulcers. In group B, twenty three (92%) patients felt marked chest pain and sixteen (64%) patients were found to have non-bleeding post banding oesophageal ulcers. The dysphagia was reported by thirteen (52%) patients while seventeen (68%) patients complained of odynophagia.

There was no stricture formation in any patient in either group. Patients in both groups were questioned about choice of repeat procedure electively. Single session group (Group B) patients uniformly were of the opinion that this procedure was very uncomfortable. In multi session group (group A) eight (30%) patients were of opinion that the procedure was very uncomfortable, three (11%) felt the procedure uncomfortable; sixteen (59%) patients tolerated the procedure well.

DISCUSSION

Endoscopic variceal band ligation (EVBL) is a safe and effective treatment for oesophageal varices both in cases of actively bleeding varices and secondary prevention of oesophageal varices.[11] Multiple sessions of endoscopic variceal band ligation obliterates varices faster with fewer complications and has been proposed as a standard of care, but the value of multi-session band ligation in controlling secondary variceal bleeding is still questionable.[12]

In our study, majority of patients presented with concomitant hematemesis and malena. Similar data was reported by Bambha *et al*[13] where 52% patients had both hematemesis and malena.

In the current study mean duration of symptoms was more than 48 hours while in a study by Hou *et al*[14] mean duration of symptoms was 8.27±5.52 hours and 9.55±5.82 hours in two groups of patients, which depicts the late reporting. The late reporting is likely due to weaker health-care system, late referrals and poor transportation facilities.

In this study, hepatitis C was the major cause of liver cirrhosis. These results are comparable with the results of the study conducted by Sarwar *et al*[15] in which 94% patients had hepatitis C virus as the cause of liver cirrhosis. Base line endoscopy revealed all patients in both groups had high grade varices with stigmata of recent bleed. In a study conducted by Chen *et al*[16] 92 % of patients had high grade varices.

The mean number of bands deployed in single session group was 10.7±1.5 while in a study conducted by Farag *at al*[12] the number of bands used in the single session esophageal variceal band ligation was 12.4±4.2. `D'Amico *et al*[17] studied re-bleeding after band ligation and described 17% re-bleeding within first 6 weeks of band ligation. Altintas *at al*[18] described the re-bleeding from oesophageal varices after band ligation in 19% patients. In present study, rate of re-bleeding after band ligation was 20% and 17% in group A and group B, respectively. Caldera *et al*[19] reported re-bleeding predominantly in the Child Class C patients, which was also true in our study.

Until our investigations, little data was available on the comparison of multi-session band ligation and single-session band ligation. Farag *et al*[12] compared the two procedures up to two years for re-bleeding rate and described 28% (14/50) and 34% (17/50) re-bleeding rate in multi-session and single-session respectively. In this study, we found 20% (6/30) and 17% (5/30) re-bleeding rate in multi-session (group A) and single session (group B), respectively.

Variceal obliteration (grade 0–1) was found in 53% and 58% in group 1 and 2, respectively by Ramirez *et al*.[20] In present study, at the end of study period, variceal obliteration was 63% and 26% in group A and B, which was comparable with the above mentioned study. While in group B, at the end of follow up period, variceal obliteration was only 26% which is lower compared to the study of Ramirez *et al*.[20]

In this study, three (10%) group A and two (7%) group B patients died due to re bleeding despite vasoactive medications and endoscopic intervention.

Sarwar *et al*[15] described 3 (13%) patients death despite repeated endoscopic treatment. Altintas *et al*[18] in their 3 years of follow up described zero mortality after oesophageal varicealband ligation for acute variceal bleed. Farag *et al*[12] described similar mortality 12% and 14% in repeated variceal band ligation and single-session variceal band ligation, respectively. The results of above studies were comparable with our study.

In our study, 30% of group A patients had mild chest pain and non bleeding post-banding oesophageal ulcers while in group B 82%, 69% and 74% patients developed marked chest pain, non-bleeding post-banding ulcers and marked odynophagia, respectively. These symptoms made patients fearful for repeat upper gastrointestinal endoscopy, though with repeated counselling, agreed for repeat procedure.

CONCLUSION

Single session band ligation is not superior but has statistically comparable rates of re-bleeding and mortality as with multi-session band ligation.

The tolerability of single session band ligation procedure is poor due to post procedure chest pain as with multi-session band ligation.

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