

# OUTCOME OF ENDOSCOPIC BAND LIGATION FOR OESOPHAGEAL VARICEAL BLEED IN PATIENTS WITH CHRONIC LIVER DISEASE

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## ABSTRACT

**Background:** Upper gastrointestinal hemorrhage secondary to esophageal varices is a common emergency in gastroenterology unit. The treatment of choice is endoscopic band ligation. The purpose of this study was to see the outcome of endoscopic band ligation in controlling acute oesophageal variceal bleeding and the number of sessions required for complete eradication of varices.

**Material & Methods:** This descriptive study was carried out in Department of Gastroenterology & Hepatology, Postgraduate Medical Institute, Lady Reading Hospital Peshawar, Pakistan, from April 2011 to August 2012. We included consecutive 113 patients, admitted to this department and underwent endoscopic band ligation for oesophageal varices. All patients had follow-up sessions at two weeks interval and subsequent band ligation was done until complete eradication of oesophageal varices. The outcome was measured in terms of control of bleeding, rebleeding, number of sessions and number of bands required for complete eradication of oesophageal varices and complications. Results were analyzed using SPSS version 10.

**Results:** Out of 113 patients, majority had Child class B 55(48.67%), followed by C 39(34.51%), and A 19(16.81%). Grade 3 oesophageal varices were the most common 78(69.02%), followed by grade 4 25(22.12%). Hemostasis was achieved in 110(97.34%) patients. In majority 69(61.05%) complete eradication was achieved in first 3 sessions. No complication was seen during follow-up.

**Conclusion:** Endoscopic variceal band ligation is an effective modality of treatment for control of acute oesophageal variceal bleeding as well as eradication of oesophageal varices, with fewer complications.

**KEY WORDS:** Endoscopic band ligation, Upper gastrointestinal hemorrhage, Oesophageal variceal bleeding, Chronic liver disease.

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**This article may be cited as:** Khan A, Mannan F, Din Ru. Outcome of endoscopic band ligation for oesophageal variceal bleed in patients with chronic liver disease Gomal J Med Sci 2013; 11:84-7.

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## INTRODUCTION

Oesophageal varices result from portal hypertension which is commonly due to liver cirrhosis and also because of non-cirrhotic portal hypertension. Variceal haemorrhage is one of the most dreadful complication of portal hypertension. Oesophageal varices are present in approximately 40% of patients with cirrhosis and in about 60% of patients with cirrhosis and ascites.<sup>1</sup> In cirrhotic patients new varices will develop at a rate of approximately 5% per year. Up to 1/4<sup>th</sup> of the patients with newly diagnosed va-

rices will bleed within two years.<sup>2</sup> The risk of bleeding is 7% by two years in patients with varices less than 5 mm in diameter, while the risk in patients with varices greater than 5 mm in diameter is 30% by two years.<sup>2</sup>

About 50% of patients with a variceal bleed stop bleeding spontaneously. Active bleeding at endoscopy, a lower initial hematocrit value, higher serum aminotransferase levels, higher Child class, bacterial infection, hepatic vein pressure gradient greater than 20 mm Hg, and portal vein thrombosis are associated with failure to control bleeding at five days.<sup>3-6</sup> Approximately one third of patients, who stopped bleeding, will rebleed within the next six weeks. About 40% of rebleeding episodes will take place within five days of the index bleed.<sup>7</sup> Predictors of rebleeding include active bleeding at emer-

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gency endoscopy, bleeding from gastric varices, hypoalbuminemia, renal insufficiency, and an HVPG greater than 20 mm Hg.<sup>2</sup> Survival during the 6 weeks following the index bleed is directly related to rebleeding. Mortality is between 15% and 50% for each bleeding episode. About 1/3<sup>rd</sup> deaths related to cirrhosis liver is secondary to variceal haemorrhage.<sup>2</sup>

The commonest causes of cirrhosis in our area are chronic hepatitis C and B. Others include alcoholic liver disease, non-alcoholic fatty liver disease and non-alcoholic steatohepatitis, metabolic diseases like haemochromatosis and Wilson's disease. In few cases the cause may not be found, the so called cryptogenic cirrhosis.<sup>5</sup>

Treatment modalities for oesophageal varices include pharmacological and endoscopic therapies. Pharmacological therapies are non-selective beta blockers and nitrates. Endoscopic therapies include injection sclerotherapy and endoscopic band ligation. Endoscopic band ligation has replaced injection sclerotherapy because of comparable results, less complications and lower risk of rebleeding.<sup>8</sup>

In Endoscopic band ligation, rubber bands are used to ligate oesophageal varices with subsequent necrosis and sloughing of the varix followed by fibrosis and re-epithelialization. This technique was first described by Stiegmann & Colleagues in 1986. Later on they showed that it had similar efficacy to injection sclerotherapy.<sup>9-11</sup> The international Baveno 5 Revising consensus in portal hypertension recommends endoscopic band ligation as the first choice therapy.<sup>12</sup> Endoscopic band ligation is now widely used modality of treatment but there are only few small studies carried out in this region.<sup>21</sup>

This study was carried out to see the outcome of endoscopic band ligation in controlling acute oesophageal variceal bleeding and the number of sessions required for complete eradication of varices.

## MATERIAL AND METHODS

This descriptive study was carried out in Department of Gastroenterology & Hepatology, Post-graduate Medical Institute, Lady Reading Hospital, Peshawar. In this study we included consecutive 113 patients who presented to gastroenterology department with upper gastrointestinal haemorrhage with cirrhosis liver, who were admitted to this department from April 2011 to August 2012 with upper G.I. bleeding (hematemesis and/or melena) and underwent endoscopic band ligation for oesophageal varices after resuscitation. During hospital stay, detail history and examination of each patients was carried

out and all the base line investigations were performed in the pathology department Lady Reading Hospital, Peshawar, including HbsAg, Anti-HCV, full blood count, liver function tests, renal function test, serum electrolytes, serum albumin, prothrombin time and ultrasound abdomen for echotexture of liver parenchyma. All patients underwent endoscopy after informed written consent, to confirm the oesophageal varices and bleeding site. The endoscope used in the procedure was Olympus video endoscope GIF140. The band used for the ligation of esophageal varices was MBL-6, Six Shooter Saeed, Multiband Ligator, Wilson-Cook Medical Inc.

The selection criteria for Endoscopic band ligation were: active bleeding/ooze from varices, oesophageal varices with Endoscopic red sign, large oesophageal varices with no other site found for bleeding. All the patients having portosystemic encephalopathy were excluded from the study. All patients were observed post procedure for 24 hours as in-patient and called for follow up sessions at 2 weeks interval for subsequent Endoscopic band ligation. Those patients who had rebleeding (early or late) were stabilized haemodynamically and another session of band ligation was performed. After complete eradication follow up sessions of endoscopy were arranged at 3 months intervals. All data was analyzed using SPSS version 10.

## RESULTS

One Hundred and Thirteen cirrhotic patients were treated with endoscopic band ligation for oesophageal variceal bleeding. Data was analyzed with SPSS version 10. Among these patients 68 (60.17%) were males and 45 (39.82%) were females. The mean patient age was 47.26±12.20. Chronic hepatitis C was the most common etiological factor followed by chronic hepatitis B. (Table 1)

**Table 1: Percentage of etiological factors in the study patients with cirrhosis liver (n=113).**

Etiology	Number of patients	Percentage
Chronic hepatitis C	64	56.63%
Chronic hepatitis B	37	32.74%
Hepatitis B & C co-infection	7	6.19%
Cryptogenic	3	2.65%
Alcoholic liver disease	2	1.76%

Child class B was most common followed by child class C and A. (Table 2)

**Table 2: Child class of the study patients (n=113).**

Child Pough class	Number of patients	Percent-age
Class B	55	48.67%
Class C	39	34.51%
Class A	19	16.81%

Most of the patients had Grade 3 & 4 oesophageal varices respectively. (Table 3)

**Table 3: Grading of oesophageal varices in the study patients (n=113).**

Endoscopic Grade	Number of patients	Percent-age
Grade 3	78	69.02%
Grade 4	25	22.12%
Grade 2	10	8.84%

Primary hemostasis at 24 hours was achieved in 110 (97.34%) patients. Re-bleeding occurred in 7 patients. Of these 3 (2.65%) patients re-bled during the first 7 days (early re bleeding) and 4 (3.53%) patients during 16<sup>th</sup> to 20<sup>th</sup> day (late re-bleeding) of the procedure. (Table 4)

**Table 4: Control of bleeding and rebleeding.**

Control of bleeding	Number of patients	Percent-age
Hemostasis achieved	110	97.34%
Early Re bleeding(<7days)	3	2.65%
Late Re bleeding(>7 days)	4	3.53%

In the majority 69 (61.05%) complete eradication was achieved in the first 3 session. (Table 5)

**Table 5: Number of sessions for eradication of oesophageal varices.**

Number of sessions	Number of patients	Percent-age
1	11	9.73%
2	25	22.12%
3	33	29.20%
4	17	15.04%
5	10	8.84%
6	10	8.84%
7	7	6.19%

To achieve complete eradication of oesophageal varices, on average 14.00±2.00 bands were used with a range from 4 to 26 in all banding sessions.

No major complication was noted during the study and follow up period except development of post band ulcer in 3 patients during the 3<sup>rd</sup> week of follow-up.

## DISCUSSION

Oesophageal variceal band ligation has significantly reduced the frequency of variceal bleeding, mortality and complications and has replaced endoscopic injection sclerotherapy as the first line therapy in oesophageal variceal bleeding.<sup>13,14</sup> However this treatment has a high recurrence rate, also needs advanced technique and incurs high cost.<sup>15,16</sup> The utility of band ligation in gastric varices is limited. Endoscopic variceal band ligation is mostly performed in the In-patient setting and is effective in primary and secondary prophylaxis of bleeding oesophageal varices in patients with cirrhosis.<sup>13</sup> Our single center prospective analysis studied 113 patients who underwent endoscopic band ligation therapy after pre endoscopic preparation of the patients and confirmation of oesophageal varices.

The aim of this study was to know the outcome of endoscopic band ligation in terms of efficacy and complications. The common endoscopic grade of oesophageal varices grade 3 (69.02%) oesophageal varices followed by grade 4. While a study done in Pakistan reported grade 3 (57.60%), followed by grade 2 oesophageal varices presented with upper GI bleeding in patients having cirrhosis liver.<sup>17</sup> In this study we documented overall successful haemostasis in 97.34% cases. Early re-bleeding (within 7 days) was 2.65%. Late re-bleeding (after 7 days) was 3.53%. A study from Turkey reported overall bleeding rate 6.1%.<sup>18</sup> Another study carried out in Germany reported 3.9% bleeding rate.<sup>19</sup> While a local study documented 3.2% bleeding rate after variceal band ligation.<sup>20</sup> These results are consistent with our study.

The number of sessions required for eradication of oesophageal varices was 1-7. In majority of the patients oesophageal varices disappeared after 3 sessions. (Table 5) The Pakistani data regarding this is scarce. Two studies have reported 3-4 sessions for post band oesophageal variceal regression.<sup>17,20</sup> While an international study has reported 2-6 sessions for band ligation.<sup>20</sup> In this study we were unable to show a correlation between the number of bands applied and the bleeding in the first 7 days. This is true in most of the studies.<sup>19</sup> However Ramirez et al showed in a prospective study that there is no better outcome for patients where more than 6 bands were applied, compared to patients treated with a maximum of 6 ligation bands.<sup>21</sup>

A number of factors may have effect upon our study like, lack of proper clinical evaluation, lack of awareness on part of patients, delayed referral and not comparing the Child Turcotte Pugh scoring with endoscopic findings and no proper records of patients using beta blocker, and lack of follow up. So a large multicentered study is needed to confirm our findings.

### CONCLUSION

Endoscopic variceal Band Ligation is an effective modality of treatment for control of acute oesophageal variceal bleeding as well as eradication of oesophageal varices.

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**CONFLICT OF INTEREST**  
 Authors declare no conflict of interest  
**GRANT SUPPORT AND FINANCIAL DISCLOSURE**  
 None declared.