

# ENDOSCOPIC BAND LIGATION IN PATIENTS WITH VARICEAL BLEEDING

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## ABSTRACT

### Introduction

Esophageal varices (EV) affect about 50% of patients with liver cirrhosis. Mortality rate from the initial EV bleeding can rise up to 30% in patients with advanced liver disease and large varices. Several RCTs have shown endoscopic variceal banding to be more effective than sclerotherapy for the long-term prevention of variceal bleeding.

### Objective

This study was conducted to see the outcome of endoscopic banding in the management of esophageal varices in Nepalese population

### Methodology

This was a prospective observational study conducted in the Department of Surgical Gastroenterology, College of Medical Sciences and Teaching Hospital (COMS-TH), Bharatpur, Nepal over a period of 2 years. Patients attending the COMS emergency/surgical OPD with history of UGI bleed with features consistent with portal hypertension during this period were enrolled. The endoscopic variceal band ligation was done based on similar principles applied to Barren and ligation in the treatment of internal haemorrhoids.

### Results

During this period of two years 50 patients were analysed. The mean age of the study subjects was 52.26+/-12.80 years and male predominance was seen (M:F=42:8). Alcoholic chronic liver disease (CLD) (74%) was the most common cause of portal hypertension. Child's B score was seen among 54%, grade III varices were seen in 36% and grade II in 32%. Acute bleeding of varices was present in nine (18%) cases. On an average 3.8 sessions were required to obliterate the varices. Control of acute bleed and variceal eradication was seen in 77.78% cases and in 96% cases respectively. Complications following banding were seen in 20% cases. Mortality was seen in two (4%) cases.

### Conclusions

Alcoholic cirrhosis was the most common cause of portal hypertension and endoscopic banding of oesophageal varices in Nepalese population had comparable eradications, complications and recurrences with similar other studies conducted in other parts of the world.

### KEYWORDS

Band ligation, portal hypertension, varices



## INTRODUCTION

Esophageal varices (EV) affect about 50% of patients with liver cirrhosis and formation rate is about 5% per year.<sup>1</sup> The overall incidence of bleeding from EV ranges from 25 to 30% at two years from the diagnosis. Mortality rate from the initial EV bleeding can still rise up to 30% in patients with advanced liver disease and large varices.<sup>2</sup> Treatment options, such as vasoactive drugs, endoscopic therapy, balloon tamponade, surgical and radiological shunt (TIPS) can be helpful to stop EV bleeding.

Endoscopic therapy is widely used for treatment of variceal bleeding. Sclerotherapy has been proven effective in control of acute bleeding and is also effective in preventing variceal rebleeding.<sup>3</sup> However, endoscopic sclerotherapy requires a skilled endoscopists and is quite frequently associated with adverse events. Banding ligation has been compared with sclerotherapy in several RCT's for the long-term prevention of variceal bleeding and found superior to sclerotherapy. Banding ligation has fewer complications and fewer procedures are needed to eradicate oesophageal varices compared to sclerotherapy, and should therefore most likely be preferred.<sup>4</sup>

Upper gastrointestinal bleed secondary to oesophageal varices due to portal hypertension is one of the deadly presentation in our emergency and OPDs. In this study we tried to study the pattern of liver disease manifesting with portal hypertension with oesophageal variceal bleeding in the Nepalese population, risk factors for variceal bleeding, endoscopic band ligation of the varices and its outcome.

## METHODOLOGY

This was a prospective observational study conducted in the department of Surgical Gastroenterology, College of Medical Sciences and Teaching Hospital (COMS-TH), Bharatpur, Nepal over a period of 2 years from 1<sup>st</sup> August 2014 to July 31<sup>st</sup> 2016. The ethical clearance was taken from ethical review committee of COMS-TH. Patients attending the COMS emergency/surgical OPD with history of UGI bleed with features consistent with portal hypertension during this period were enrolled. Patients with endoscopic diagnosis of oesophageal varices secondary to portal hypertension were included in the study but those patients with age less than 18 years, with cirrhosis harbouring Hepatocellular carcinoma (HCC), with esophageal varices with prior endoscopic or surgical management of esophageal varices and with evidence of fundal varices were excluded. Written consent was taken before performing endoscopic banding.

In the emergency actively bleeding cases were resuscitated and stabilized by giving I.V. fluids, blood transfusion and inj. Octreotide. All the patients were admitted in the hospital. Detailed history was taken and thorough clinical examination was done. The patient's demographics were recorded in the history. Esophagogastro-duodenoscopy was done to establish the cause of UGI bleed. If esophageal varices were present they were graded into four grades (Paquet's classification). Patients with active variceal bleed were

subjected for endoscopic variceal band ligation while performing the diagnostic endoscopy.

The endoscopic variceal band ligation was done based on similar principles applied to Barren and ligation in the treatment of internal haemorrhoids, the bands used were elastic rubber bands ('O' rings). The band ligation procedure was conducted under topical anaesthesia and I.V. Sedation (Inj. Diazepam).

All the procedures were carried out using PENTAX EG-2770K Fibre Optic Endoscope and the Multi Band Ligator-Barrel device (SHAILI ENDOSCOPY, GUJARAT, INDIA).

Treatment by band ligation was started at the distal part of esophagus usually at the gastro esophageal junction. The ligation was done on an average of 3-4 lesions and maximum of '6' bands were applied in a single sitting.

In actively bleeding patients the blood was flushed with water, sucked and the elastic rubber 'O' ring was directly placed on the varix at the point of bleeding site. If bleeding was not controlled than banding was done over the mucosa above and below the point of bleeding.

Patients who had emergency procedures were admitted in the surgical ward with the following advices:

1. NPO for next 12 hours.
2. Semisolid, cold, bland feeds for next 72 hrs.
3. Inj. Ceftriaxone 1gm I.V. Stat.
4. Inj. Omeprazole 40 mg BD for 2 days.
5. No oral NSAIDS.
6. Retrosternal chest pain, odynophagia, fever etc. were treated symptomatically.

Patients who had elective endoscopic band ligation were kept for two hours for observation in the recovery room and were discharged with cap omeprazole 20 mg BD for 2-4 weeks depending on the interval between sessions and syrup Sucralfate 2tsf tds for 1 week. (To help in the healing process of esophageal ulcers produced due to ligation).

The follow up was done three weekly after the index procedure till all the varices were eradicated and then three monthly for next six months. Endoscopic sessions were done in between the follow-up if patients presented with features of active UGI bleeding from esophageal varices. In the follow up following findings were noted endoscopically.

- ⇒ Ulcers of the oesophagus at the site of ligation.
- ⇒ Scars at the site of ligation
- ⇒ The number of residual varices, if any
- ⇒ Number of variceal columns
- ⇒ Reduction in the grading of varices compared to varices before ligation
- ⇒ Re-bleeding of the varices, if any.
- ⇒ During the follow up the remaining varices were ligated or sclerosed (depending upon the index procedure) until they reduced in diameter to grade one or they could not be ligated or injected. After successful treatment of varices the patients were advised to come three monthly for next six months during which the recurrence of varices or any complications were noted.



## STATISTICAL ANALYSIS

Data were entered directly into SPSS version 20 and were analysed. In descriptive statistics for the qualitative variables frequency and percentage was shown, for quantitative variable means and standard deviation was calculated. In the inferential statistics to find the association between variables chi-square test was used. Statistical significance was considered if p-value was less than 0.05.

## RESULTS

During this period of two years though 63 patients with UGI bleed with oesophageal varices were evaluated in the study, however only 50 were analysed. Thirteen patients were excluded because five of them had history of prior endoscopic procedure, three had gastric varices, one patient had Hepatocellular carcinoma and four patients did not come for regular follow up. In this study oesophageal varices secondary to portal hypertension was more commonly seen in the age 40 years to 65 years as shown in figure 1. The mean age of the study population was 52.26 $\pm$ 12.80 years and male predominance was seen (M:F=42:8). Among the causes of portal hypertension alcoholic chronic liver disease (CLD) (74%) was the most common cause of portal hypertension with variceal bleed followed by Hepatitis B virus CLD (12%), extra-hepatic portal hypertension (10%) and cryptogenic CLD. Coming to Child's Pugh score most of the patient were of Child's B (54%) followed by C(24%) and A(22%). Grade III varices were seen in 36%, grade II in 32%, grade IV in 24% and grade I in 8% cases. Acute bleeding of varices was present in nine (18%) cases. On an average 3.8 (minimum two and maximum five) sessions were required to obliterate the varices. Control of acute bleed was achieved in 77.78% cases. Variceal eradication was achieved in 96% cases, recurrence of variceal bleed was seen in 22% cases and recurrence of varices after eradication was seen in 14% cases. Complications following banding were seen in 20% cases with dysphagia seen in 8% cases. Mortality was seen in two (4%) cases. The cause of mortality in both cases was acute bleed with decompensated liver failure in patient with Child's Pugh grade C with grade IV varices. From the table 1, 2, 3 and 4 we can see that variceal rebleeding and variceal recurrence were more with higher grades of varices and higher grades of Child's Pugh score and these findings were statistically significant ( $p < 0.05$ ).

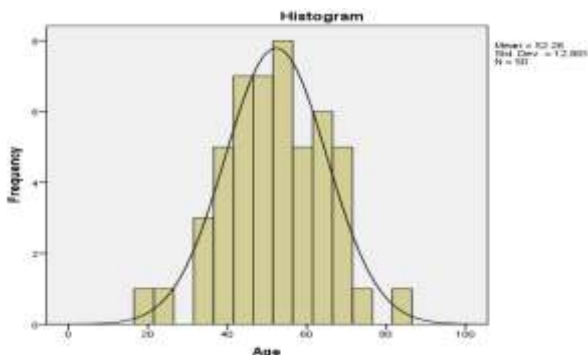


Figure 1: Histogram showing age distribution in the study

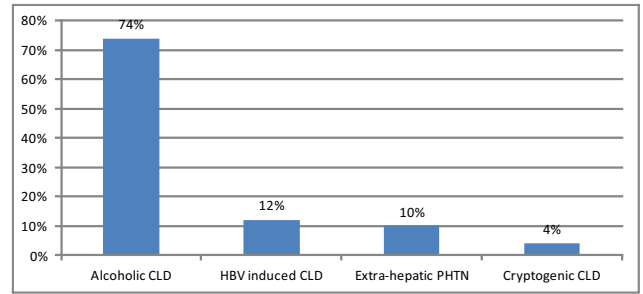


Figure 2: Etiology of portal hypertension

Table 1: Relationship between grade of varices and recurrent bleeding

Grades of varices	Recurrent bleeding			Total	p-value
	Yes	No	NA		
1	0	4	0	4	
2	1	15	0	16	
3	3	15	0	18	0.008
4	7	4	1	12	
Total	11	38	1	50	

Table 2: Relationship between grade of varices and recurrence of varices

Grades of varices	Recurrence of varices			Total	p-value
	Yes	No	NA		
1	0	4	0	4	0.023
2	0	16	0	16	
3	3	15	0	18	
4	4	6	2	12	
Total	7	41	2	50	

Table 3: Relation between Child's pugh score and recurrent bleeding

Child's pugh score	Recurrent bleeding			Total	p-value
	Yes	No	NA		
A	0	11	0	11	0.012
B	5	22	0	27	
C	6	5	1	12	
Total	11	38	1	50	

Table 4: Relation between Child's pugh score and recurrence of varices

Child's pugh score	Recurrence varices			Total	p-value
	Yes	No	NA		
A	0	11	0	11	0.001
B	2	25	0	27	
C	5	5	2	12	
Total	7	41	2	50	

## DISCUSSION

Among several complications of portal hypertension, including ascites, hepatic encephalopathy, and renal insufficiency, variceal hemorrhage is the most dramatic with a high mortality rate. Endoscopic therapies for varices aim to

reduce variceal wall tension by obliteration of the varix. The two principal methods available for esophageal varices are endoscopic sclerotherapy (SCL) and band ligation (EVL). This study was conducted to evaluate the pattern of liver disease manifesting with portal hypertension with oesophageal variceal bleeding in the Nepalese population, risk factors for variceal bleeding, endoscopic band ligation of the varices and its outcome.

In this study oesophageal varices secondary to portal hypertension was more commonly seen in the age 40 years to 70 years. The mean age of study population was  $52.26 \pm 12.80$  years. The mean age of the study population and the distribution of ages in the current study was comparable with the study done by Stiegmann et al. (1992) and Shafqat et al. (1998).<sup>5-6</sup>

Male predominance was seen in the current study with males comprising 84% of the study population. This finding may be due to the fact that alcoholic cirrhosis was one of the major cause of portal hypertension leading to variceal bleed in our study. Maskey et al. (2011) in a study from Nepal showed male predominance in alcoholic cirrhosis.<sup>7</sup> In different studies comparing endoscopic band ligation with endoscopic sclerotherapy, Stiegmann et al. (1992) and Shafqat et al. (1998) also found male predominance.<sup>5-6</sup>

Although portal hypertension could result from pre-hepatic abnormalities, post-hepatic abnormalities, intrahepatic non-cirrhotic causes, cirrhosis is by far the most common cause of portal hypertension. In the current study we found alcoholic cirrhosis as a cause of portal hypertension in 74% study population. Study done by Karki et al. (2013) found cirrhosis as a cause of portal hypertension in 78.3% of the study population in Nepal. Stiegmann et al. (1992) and de la Pena et al. (1999) in their study found alcoholic cirrhosis to be the major cause (81.6% and 65.9% respectively) of oesophageal varices.<sup>5,8,9</sup>

Different studies have shown that acute bleeding of the varices at presentation is an independent risk factor for variceal recurrence.<sup>10</sup> In the current study around 18% of the study population was bleeding at index presentation. Stiegmann et al. (1992) from USA; Lo et al. (1995) from China and Luz et al. (2011) from Brazil found similar presentation of patients with 15-27% of the study population presenting with acute bleed at index presentation.<sup>5,11,12</sup> A meta-analysis comparing the use of sclerotherapy and band ligation published in 2006 involving 1309 patients has shown the efficacy of endoscopic SCL for initial hemostasis to be on average 95% (76%-100%), and that of EVL to be on average 97% (86%-100%).<sup>12</sup> In the current study EVL controlled acute bleed in 77.78% of patients which is slightly lower than shown in the meta-analysis and this can be explained by the small sample size in our study.

Various studies have shown size of varices as a risk factor for variceal bleed and recurrence. In the present study, the frequency of grade II varices in 32% cases, Grade III varices in 36% cases and grade IV varices in 24% cases were

observed. These findings were more or less similar to the findings of Luz et al. (2011).<sup>12</sup>

Child-Pugh score at the bedside, is widely used as a simple descriptive or prognostic indicator. Multivariate analyses using Child-Pugh score as an entity have shown that it has an independent prognostic value in the settings of ascites, ruptured oesophageal varices, alcoholic cirrhosis and decompensated HCV-related cirrhosis.<sup>13</sup> In the present study Child's score A in 22%, Child's B in 54% cases and Child's C in 24% cases were found. Similar distribution of patients was seen in study done by de la Pena et al. (1999) reporting Child's A- 23.9%; Child's B-50.0% and Child's C in 26.1%.<sup>9</sup>

Variceal bleeding is the most severe outcome of portal hypertension. Endoscopic sclerotherapy and band ligation are endoscopic treatment modalities for both active variceal bleeding and secondary prophylaxis. Variceal recurrence and re-bleeding are the common drawbacks with endoscopic treatment. From the studies by Hou et al. (1995), Sarin et al. (1997) and Avgerinos et al. (1997) the eradication of varices, re-bleeding of varices and recurrence of varices by endoscopic band ligation was 87%-96%, 6%-27% and 29-48% respectively. In the current study the eradication of varices, re-bleeding of varices and recurrence of varices by endoscopic band ligation was 96%, 22% and 14% respectively.<sup>14-16</sup>

The probability of variceal bleeding is significantly greater in patients with larger esophageal varices, with more severe red wale marks and with more severe liver dysfunction according to the Child-Pugh classification.<sup>17</sup> de la Pena et al. (1999) in his study has shown that Child-Pugh class C and variceal grade IV had an influence on eradication failure, Child-Pugh class was a definite index of survival and recurrence of variceal bleeding, and variceal grade was a prognostic factor for variceal bleeding.<sup>9</sup> In the current study also we found that variceal recurrence and rebleed increased with increase in the child pugh's score and increase in the grade of varices.

Laine et al. (1993); Hou et al. (1995); Sarin et al. (1997); and Avgerinos et al. (1997) reported complications ranging from 5%-45% and mortality ranging from 6%-22% following endoscopic band ligation in the management of esophageal varices. In the current study complications was seen in 20% cases and mortality in 4% cases and these findings are more or less comparable.<sup>4,14-16</sup>

## CONCLUSIONS

From the current study it can be concluded that alcoholic cirrhosis is the most common cause of portal hypertension and hence variceal bleeding in the Nepalese population. Patients with larger varices and high Child's pugh score were having more recurrent bleeding and more recurrence. Endoscopic banding of varices in the current study was comparable to other studies.





## RECOMMENDATIONS

Endoscopic band ligation is an effective tool for controlling oesophageal variceal bleed secondary to portal hypertension in Nepalese population with comparable outcomes. Hence endoscopic banding should be used early to control as well as prevent recurrent bleeding from oesophageal varices secondary to portal hypertension.

## LIMITATION OF THE STUDY

Small sample size over a limited period of time was the main limitations. The study being conducted in a small population

its generalization to whole Nepalese population will be a limitation. Liver biopsy was not done to know the pathology in cryptogenic chronic liver diseases.

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## CONFLICT OF INTEREST

None

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