



## Variceal band ligation and its outcome: a single Tertiary Care Centre study.

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**ABSTRACT... Objectives:** To determine the frequency of complications after esophageal variceal band ligation in patients of decompensated chronic liver disease. **Study Design:** Descriptive Case study **Setting:** Department of Gastroenterology Lahore General Hospital, Lahore. **Period:** June 2015 to June 2016. **Material & Methods:** In the present study, the cases of both genders and age more than 20 years having esophageal variceal of any grade on variceal screening esophagogastroduodenoscopy and duration of decompensated liver cirrhosis of at least 6 months or more were included. Esophageal variceal band ligation was performed using a multiband ligation device (Six-shooter, Wilson-Cook Inc., Winston-Salem, NC) and up to 6 bands were placed per session and next session was performed at 2 week intervals until esophageal varices were eradicated, which was defined as a complete disappearance of varices and/or the presence of a varix being too small to be ligated. **Results:** In this study there were total 720 cases out of which 450 (62.5%) were males and 270 (37.5%) females. The mean age of the subjects was  $33.504 \pm 4.00$  years, mean duration of cirrhosis was  $9.086 \pm 2.54$  months and mean weight was  $72.44 \pm 13.78$  Kg. Ulcer bleed was seen in 6.9% patients and esophageal strictures was seen in 2.5% patients. **Conclusion:** Complications of esophageal variceal band ligation are not that common and amongst them ulcer bleed is the salient one. Both ulcer bleed and esophageal stricture are significantly associated with varices more than 2.

**Key words:** Band Ligation, Esophageal Strictures, Ulcer Bleed.

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## INTRODUCTION

Liver cirrhosis is defined as an irreversible damage and scarring due to ongoing inflammation of the liver parenchyma. There are number of causes leading to this, among them hepatitis B and C are the most common infections and alcoholism as the leading non infectious causes.<sup>1,2</sup>

It can result in various complications like portal hypertension, ascites, GI (gastrointestinal) bleeding, varices, porto pulmonary and porto systemic hypertension, caput medusa, spider angioma, AV malformations, hepatic encephalopathy etc.<sup>3-4</sup>

Portal hypertension is considered among the highly morbid and fatal complication of liver cirrhosis and it results from the combination

of increased intrahepatic vascular resistance and increased blood flow through the portal venous system. Portal hypertension causes the development of porto systemic collaterals, among which esophageal and gastric varices are the most relevant. Their rupture can result in variceal hemorrhage, which is one of the most life threatening complication of cirrhosis.<sup>5-6</sup>

Prospective studies have shown that more than 90% of cirrhotic patients develop esophageal varices sometime in their lifetime and 30% of these will bleed. When cirrhosis is diagnosed, varices are present in about 30%-40% of compensated patients and 60% present with ascites.<sup>7-8</sup> Stigmann et al first introduced the technique of endoscopic band ligation. This mechanical method of obliterating variceal with elastic O-ring

should produce no systemic sequelae.<sup>9</sup> Studies have been done on variceal banding about the safety and efficacy of the method. Some trials have shown that banding is superior with respect to prevention of recurrences, control of active bleeding and survival.<sup>10</sup> However, long term follow up have shown variable complications and their prevalence, among them ulcer bleeding and esophageal strictures are salient one.

To determine the frequency of complications after esophageal variceal band ligation in patients of decompensated chronic liver disease.

## MATERIAL & METHODS

This was a descriptive case study carried out at Department of Gastroenterology Lahore General Hospital, Lahore during June 2015 to June 2016. The cases were selected via non probability consecutive sampling. In this study a total of 720 patients of both genders and age more than 20 years having esophageal variceal of any grade on variceal screening esophagogastroduodenoscopy and duration of decompensated liver cirrhosis of at least 6 months or more were included. The cases underwent detailed laboratory, radiological and clinical examination to assess for duration of cirrhosis, West Haven criteria to grade for encephalopathy.

Patients with history of gastrointestinal (GI) bleeding, hepatocellular carcinoma (HCC) on biopsy, pregnancy on ultrasound and history of gastric or duodenal ulcer were excluded. Patients were undergone ligation after an initial screening gastroscopy that was performed to assess the size and appearance of esophageal and gastric varices and to exclude other lesions such as ulcers and tumors. The intravenous administration of 5 to 10 mg of diazepam was used for sedation on individual basis. Esophageal variceal band ligation was performed using a multiband ligation device (Six-shooter, Wilson-Cook Inc., Winston-Salem, NC) and up to 6 bands were placed per session beginning in the distal esophagus just above the gastro esophageal junction. Next session was performed at 2 weeks intervals until esophageal varices were eradicated. Variceal eradication was defined as a complete disappearance of varices

and/or the presence of a varix being too small to be ligated (< 5 mm). All patients were followed every month for any history of upper GI bleed and upper GI endoscopy was done at 6 months. Data was recorded regarding complications in terms of ulcer bleed and esophageal strictures.

Data was analyzed with statistical analysis program (SPSS version11). Frequency and percentage was computed for qualitative variables and Mean  $\pm$ SD was presented for quantitative variables. Effect modifiers were controlled by stratification. Post stratification chi square test was applied  $p \leq 0.05$  was considered statistically significant.

## RESULTS

In this study there were total 720 cases out of which 450 (62.5%) were males and 270 (37.5%) females (Table-I). There were 392 (54.4%) of the cases that had varices grade 1-2 (Table-I). The mean age of the subjects was  $33.50 \pm 4.00$  years, mean duration of cirrhosis was  $9.086 \pm 2.54$  months and mean weight was  $72.44 \pm 13.78$  Kg (Table-II). Ulcer bleed was seen in 6.9% patients and esophageal strictures was seen in 2.5% patients (Figure-I). Stratification of ulcer bleed and esophageal strictures with respect to age groups, gender, BMI, duration of cirrhosis, grade of esophageal varices and West Haven Grade are shown in Table-III.

Gender	No of Patients	%age
Male	450	62.5%
Female	270	37.5%
Grades		
1-2	392	54.4%
>2	328	45.6%

**Table-I. %age of patients according to gender (n=720).**

Demographics	Mean $\pm$ SD
Age(years)	$33.504 \pm 4.00$
Duration of cirrhosis(months)	$9.086 \pm 2.54$
Weight(Kg)	$72.436 \pm 13.78$

**Table-II. Mean  $\pm$ SD of demographics (n=720).**

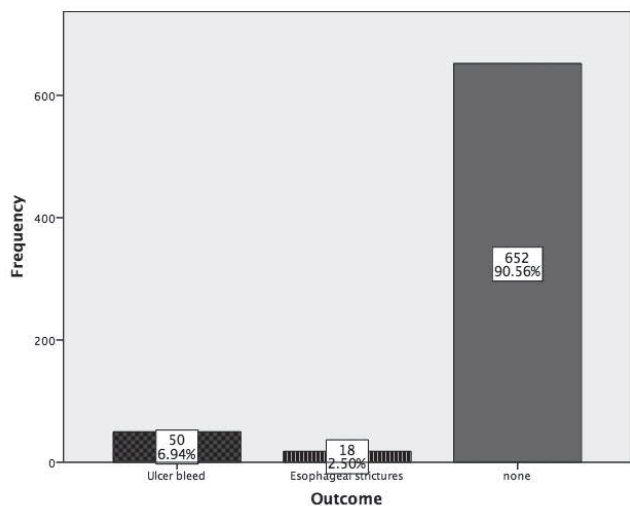


Figure-1. Outcome (n=720).

Variables		Ulcer Bleed		P-Value
		Yes	No	
Age	18-30	11(8.4%)	120(91.6%)	0.470
	31-40	39(6.6%)	550(93.4%)	
Gender	Male	37(8.2%)	413(91.8%)	0.08
	Female	13(4.8%)	257(95.2%)	
BMI	21-25	17(8.3%)	188(91.7%)	0.395
	26-30	20(7.5%)	246(92.5%)	
	>30	13(5.2%)	236(94.8%)	
Duration of cirrhosis	<1 year	35(6.7%)	485(93.3%)	0.71
	1 or more	15(7.5%)	185(92.5%)	
Grade of varices	1-2	17(4.3%)	375(95.7%)	0.03
	>2	33(10.1%)	295(89.9%)	
West Haven grade	1-2	32(7.7%)	382(92.3%)	0.33
	3-4	18(5.9%)	288(94.1%)	
<b>Esophageal Strictures</b>				
Age	18-30	4(3.1%)	127(96.9%)	0.65
	31-40	14(2.4%)	575(97.6%)	
Gender	Male	13(2.9%)	437(97.1%)	0.39
	Female	5(1.9%)	265(98.1%)	
BMI	21-25	6(2.9%)	199(97.1%)	0.89
	26-30	6(2.3%)	260(97.7%)	
	>30	6(2.4%)	243(97.6%)	
Duration of cirrhosis	<1 year	13(2.5%)	507(97.5%)	1.0
	1 or more	5(2.5%)	195(97.5%)	
Grade of varices	1-2	4(1.0%)	388(99.0%)	0.005
	>2	14(4.3%)	314(95.7%)	
West Haven grade	1-2	9(2.2%)	405(97.8%)	0.51
	3-4	9(2.9%)	297(97.1%)	

Table-III. Outcomes with respect to confounders (n= 720).

**DISCUSSION**

Upper GI bleed is a common presentation and endoscopic variceal ligation (EVL) is commonly practiced now, which was first done by Steigmann in 1986.<sup>11</sup>

The data has shown that ligation fasten the process of variceal obliteration by causing fibrosis and recurrence rates are low for longer periods of follow up.<sup>12,13</sup> There are no systemic side effects associated with esophageal variceal band ligation as compared to injection sclerotherapy. The major complications of the procedure include discomfort, dysphagia, esophageal strictures, re bleed etc.<sup>13</sup>

In the present study ulcer bleed was seen in 6.9% patients and esophageal strictures was seen in 2.5% of the patients, respectively. There results were close to the findings of the study done by Lo et al.<sup>14</sup> where they did this intervention in 120 cases of esophageal varices and it was found that its was highly efficacious and the only complication observed in 3 cases was ulcer bleeding.<sup>14</sup>

In another study done by Laine et al.<sup>15</sup> carried out a meta-analysis and compared EVL to sclerotherapy and it was found equally effective in both cases but the re-bleeding was an issue and was seen in more cases with band ligation.<sup>15</sup>

Re bleeding from band ligation of the esophageal varices was also the major complication that was observed in short term follow up in a study done by Shahi H et al.<sup>16</sup> According to another study done by Shrestha B et al this was seen in only one (1.2%) out of 83 cases.<sup>17</sup>

Sarin et al.<sup>18</sup> in their study also revealed a highly efficacious outcome in cases with EVL as compared to propranolol, where risk of bleeding was equal in both groups.<sup>18</sup>

In the present study esophageal strictures was seen in 2.5% patients which were similar to the study done by Stanley et al and seen in 2% of the cases.<sup>19</sup>

In another study compared EVL with sclerotherapy and both had equal rates of stricture formation

having less than 5% of the cases and re bleed was the commonest complication after dysphagia.<sup>20</sup>

In another study carried out by Masci et al.<sup>22</sup> esophageal stenosis after banding was reported as 2% whereas its incidence after sclerotherapy ranged between 0 and 33%; the incidence of bleeding from treatment-induced ulcers was lower with banding in all studies but one.<sup>23</sup> In a study done by Arasu S et al, there was none of the cases found with stricture after EVL.<sup>24</sup>

## CONCLUSION

Complications of esophageal variceal band ligation are not that common and amongst them ulcer bleed is the salient one. Both ulcer bleed and esophageal stricture are significantly associated with varices more than 2.






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3	Shafqat Rasool	Data collection.	
4	M. Usman Khan	Data collection.	
5	Akif Dilshad	Review of paper.	
6	Asif Mehmood	Review of paper.	