

## POST ESOPHAGEAL VARICEAL BAND LIGATION PAIN, ANOTHER INSULT TO INJURY

Muhammad Hafeez, Raja Ghayas Khan, Adnan Qadir, Anjum Aijaz

Combined Military Hospital Kharian/National University of Medical Sciences (NUMS) Pakistan

### ABSTRACT

**Objective:** To measure and characterize pain in post esophageal variceal band ligation patients.

**Study Design:** Cross sectional observational study.

**Place and Duration of Study:** This study was carried out in Combined Military Hospital Kharian which is a tertiary care hospital, from Dec 2014 to Aug 2015.

**Material and Methods:** All patients of esophageal varices due to any underlying pathology requiring esophageal variceal band ligation (EVBL) were included in this study. Patients unwilling for EVBL were excluded from the study. Their EVBL was done with the help of Upper Gastrointestinal Pentax High definition 90i series Video Endoscope and subsequently they were inquired about the details of pain till next session of banding.

**Results:** Out of 86 patients 63 (73%) were males and 23 (27%) were females. Their mean age was 54 years with SD  $\pm 12$ . Pain was present in 47 (54%) patients and 39 (46%) were pain free. It was severe in 3 (7%), moderate in 34 (72%) and mild in 10 (21%) patients. Out of post EVBL pain group 30 (65%) patients experienced pain after first EVBL session, 12 (25%) in subsequent and 5 (10%) after all the sessions.

**Conclusion:** Post EVBL pain is a common complication. Mostly it is mild to moderate in intensity and needs attention in almost half of the patients to relief the suffering.

**Keywords:** Decompensated chronic liver disease, Esophageal varices, Post EVBL pain.

---

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

---

### INTRODUCTION

Upper gastrointestinal bleeding secondary to esophageal varices is one of major complications of decompensated chronic liver disease (DCLD). Esophageal varices develop when hepatic venous pressure gradient (HVPG) is increased to 10 mm of Hg and may bleed when above 12 mmHg<sup>1</sup>. With a single episode of bleeding, mortality is increased to 20%<sup>2</sup>, rebleed in 40% in 6 weeks and 75% at one year. Injection sclerotherapy i.e. sclerosing agents e.g. sodium morrhuate in varices is being practiced since the last decade of previous century. The sclerosing agent leads to necrosis of esophageal tissue and mucosal ulcers. This procedure lost its popularity because of certain complications like rebleeding in case of large ulcers, stricture formations, less common complications like perforation, mediastinitis and more number of sessions required to obliterate varices. Complications are

more if sclerotherapy is performed weekly as compared to if done at two or three weeks interval<sup>3</sup>. Currently EVBL is considered to be the first-line treatment in bleeding esophageal varices and has good therapeutic effect in esophageal variceal rebleeding<sup>4,5</sup>. Meta-analysis has found that EVL is better than sclerotherapy in terms of lower rates of rebleeding, complications, and higher rates of variceal eradication<sup>6</sup>. This procedure is not free of side effects like transient dysphagia, worsening of portal hypertensive gastropathy<sup>7</sup>, retrosternal burning sensations and at times moderates to severe pain requiring intervention to relieve the pain. Pain is an established side effect but few studies describe the details of the pain as elaborated in this study.

### MATERIAL AND METHODS

Patients with esophageal varices due to any underlying pathology like DCLD or portal vein thrombosis requiring EVBL were included in this study. Patients of above mentioned diseases having small varices not requiring EVBL or not willing to be included in the study were excluded

---

**Correspondence:** Dr Muhammad Hafeez, Classified Medical Specialist CMH Kharian Pakistan (Email: dmhafeez@yahoo.com)  
Received: 15 Apr 2016; revised received: 23 Nov 2016; accepted: 05 Dec 2016

from the study. Informed consent was taken from the patients and study was approved from the ethical committee of the hospital. After the demographic data of the patients, information was gathered on the following lines. Mode of presentation e.g. upper gastrointestinal (GI) bleed secondary to esophageal varices, screening for esophageal varices in patients of DCLD or surveillance in case of previous EVBL sessions. Patients were investigated to find out underlying pathology e.g. hepatitis B, C or D serology, Anti mitochondrial antibodies in suspicion of primary biliary cirrhosis or portal vein doppler studies in case of portal vein thrombosis. Child-Turcotte-

rating scale (N-11)<sup>8</sup>. It is an 11 point scale to assess the severity. Its severity was classified as none, mild, moderate and severe for points 0, 1-3, 4-6 and 7-10 respectively. They were also inquired about the duration of pain in hours to further assess the severity. Pain less than 24 hours was graded as mild, 24 to 72 hours moderate and more than 72 hours was severe. Nature of pain was assessed on pain assessment quality scale (PAQS). For PAQS they were inquired about whether pain was sharp, diffuse retrosternal discomfort, sensitive, tender, shooting, numb, aching, burning and heaviness. Pain relation with banding session was inquired i.e. after first

**Table-I: Mode of presentation of patient required esophageal variceal band ligation.**

Mode of presentation	Frequency	Valid percentage	Cumulative percentage
Upper GI bleed	57	66.3	66.3
Screening for esophageal varices	16	18.6	84.9
Surveillance of EVBL	13	15.1	100.0
Total	86	100.0	

**Table-II: Aetiology of diseases leading to esophageal varices.**

Aetiology of disease	Frequency	Valid percent	Cumulative percentage
chronic Hepatitis C	71	83.5	83.5
chronic Hepatitis B	4	4.7	88.2
PBC	1	1.2	89.4
HCV e HCC	2	2.4	91.8
Portal Vein Thrombosis	1	1.2	92.9
NASH	1	1.2	94.1
Cryptogenic	5	5.9	100.0
Total	85	100.0	
Missing System	1		
Total	86		

Pugh (CTP) criterion was recorded on the basis of serum bilirubin, albumin levels in mg/dl, international normalized ratio (INR), presence and severity of ascites and encephalopathy. Video Upper GI endoscopy was done after the consent, throat spray with lignocaine 4% solution and conscious sedation with injection midazolam. Dose of midazolam was adjusted keeping underlying disease and age of the patient in mind. Multi-band ligators manufactured by the Wilson-Cook medical GI endoscopy company were used. After the procedure they were inquired about the pain as per numeric pain

session, in subsequent or every time after the procedure. Patients were followed up till next session. Repeat endoscopy of the patients was done after every two weeks interval till varices completely obliterated. Total numbers of EVBL sessions required in each patient to obliterate varices were recorded. Data like descriptive statistics including mean, frequency and percentage were calculated on the latest version of SPSS 22.

## RESULTS

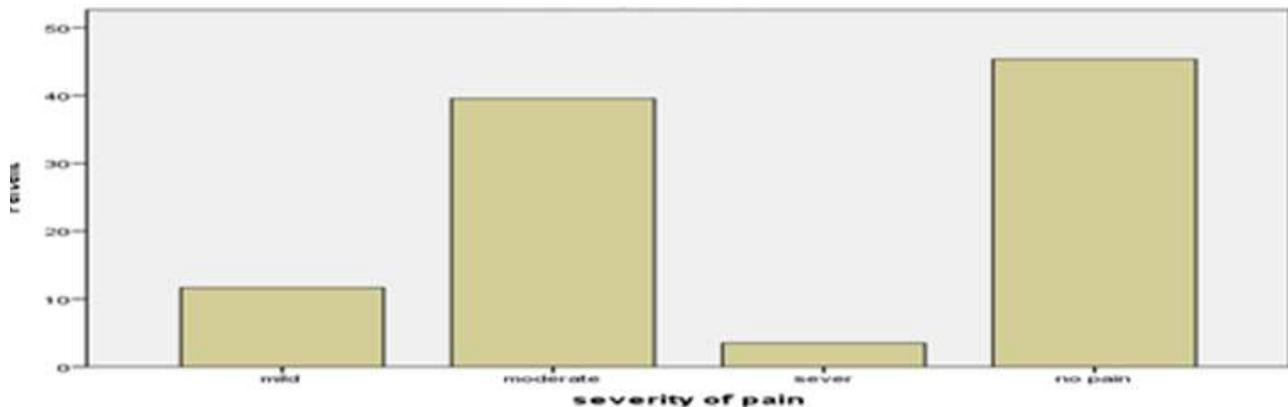
In 86 patients, 63 (73%) were male and 23 (27%) female. The mean age was 54 years with SD

± 12.47%. Post EVBL male to female pain ratio was 70:30. The main reason for upper GI endoscopy requiring esophageal variceal band ligation was upper gastrointestinal bleed followed by screening for esophageal varices as mentioned in table-I. Amongst the patients of DCLD, hepatitis C was the main cause followed by cryptogenic and hepatitis B as shown in table-II. The percentage of patient's child class was A, B; C was 12, 43 and 31% respectively. Post EVBL chest pain was noted in 46 (54%) while 40(46%) were pain free. Ratio of the severity of the pain i.e. mild, moderate and severe is shown fig-1. Mean duration of pain was 27 hours with SD ± 36. Character of pain was retrosternal chest discomfort, burning, sharp, shooting and aching with frequency as shown in fig-2. Retrosternal chest discomfort, burning sensation and aching

(25%) in subsequent and in 5 (10%) after all the sessions. Sixty five patients (85%) had pain during the initial post EVBL days likely because of esophageal spasm and 21 (15%) after one week because of ulcer formed at variceal slough off sites.

## DISCUSSION

Upper GI bleed due to portal hypertension is a devastating complication of cirrhosis liver. Pharmacological treatment includes non-selective Beta blockers like nadolol, propranolol and carvedilol. Endoscopic treatments are injection sclerotherapy and esophageal variceal band ligation. EVBL is preferred treatment in esophageal varices<sup>2,4</sup>. EVBL and b-blockers are more effective in secondary prophylaxis than either treatment alone<sup>9,10</sup>. EVBL has better



**Figure-1: Severity of the post esophageal variceal band ligation pain.**

was more common in mild cases and moderate cases, while it was sharp and shooting in severe cases. Mild pain settled on its own in a day without any medication in 10 (11.5%) cases, moderate pain settled easily with sucralfate or lidocaine: antacid solution in 33 (40%) cases within 2 to 3 days. Severe pain was in 3 (3.5%) and lasted for 7 to 10 days requiring pain killer in addition to the sucralfate or lidocaine: antacid solution. In 86 patients 207 EVBL sessions were done with minimum 1 and maximum 10 with average 2.4 sessions per patient. A total of 516 bands were applied with average of 6 per patient. In post EVBL pain group 30 (65%) patients experienced pain after first EVBL session, 12

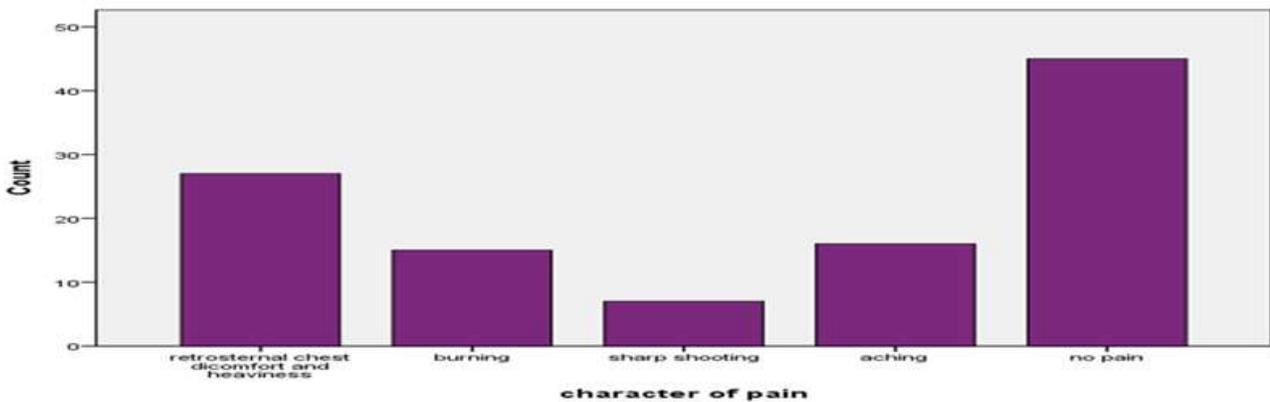
efficacy in control of esophageal variceal bleed in Child's class A and B than in C with high model for endstage liver disease (MELD) score<sup>11</sup>. Argon Plasma Coagulation (APC) followed by EVBL is another emerging concept to eradicate the varices and to reduce the risk of recurrent bleed<sup>12</sup>. EVBL has lesser (14%) and minor complications including transient dysphagia, chest discomfort and small ulcers formation around the base and less risk of rebleed<sup>4,13</sup>. Unusual complications associated with EVBL are perforation, stenosis and mesenteric vein thrombosis<sup>14-17</sup>. In our observation, retrosternal chest discomfort and heaviness was in 21% followed by aching, burning in 12% and 10% respectively as shown in

fig-2. The frequency of pain was 54% including both multiple as well as single band therapy that matches the average frequency observed by Ali et al in which the frequency of pain in multiple versus single band therapy groups was 30% and 82% respectively<sup>18</sup>. Majority of the patients had pain, mild to moderate in intensity, which used to settle on its own or with sucralfate or lidocaine: antacid solution. However intense sharp shooting severe pain group required painkillers in addition to the medicines mentioned above. Immediate esophageal pain is due to an abnormal process inside, esophageal spasm or esophageal hyper sensitivity. It is either due to stimulation by chemoreceptors due to acid or hyperosmolar substances, mechano receptors by distension or thermo receptors by hot and cold food<sup>19</sup>. In our

group was poor due to post procedural chest pain as compared to multisession band ligation. Mean duration of symptoms was 27 hours with SD  $\pm$  36 in comparison to a study by Hou et al in which mean duration was  $8.27 \pm 5.52$  and  $9.55 \pm 5.82$  hours respectively in two groups of patients<sup>21</sup>. Pain was more than double in males as compared to females (70:30) likely due to hypersensitivity, difference in patients as described by Hobson et al<sup>22</sup>. On paired sample t-test analysis there was no statistical significant correlation observed between Child's class, cause of the bleed with severity or occurrence of the pain. A *p*-value  $\leq 0.05$  was considered statistically significant.

**Limitation of Study**

It was difficult to elaborate the pain



**Figure-2: Post esophageal variceal band ligation pain character experienced by the patient.**

study, amongst the pain group immediate post EVBL pain was observed in 85% due to esophageal spasm and in 15% after a week due to esophageal ulcer formation. Esophageal ulcers in EVBL are superficial and resolve faster as compared to sclerotherapy induced ulcers 14 versus 21 days<sup>13,20</sup>. Probably that was the reason pain in ulcer stage was comparatively less common and mild if present at all in the index study. Pain was more on first session in majority of the patients i.e. 65%, in comparison to study by Hyder et al, amongst the two groups i.e. multiband therapy versus single band therapy, pain was severe in later group i.e. 82%. In this study tolerability of single session band ligation

especially in old patients because of low threshold for pain and in patients with encephalopathy. Other associated diseases like reflux esophagitis or ischemic heart disease that can be triggered after banding were not included in the protocol. Pitfall of the study is that pain was not assessed separately in multiple versus single band therapy.

**Contribution of study**

Post EVBL pain is a common problem that has been mentioned in a number of studies but has never been stressed upon regarding its details like frequency, character and severity which are highlighted in this study.

## CONCLUSION

Post EVBL pain is a common complication. Mostly it is mild to moderate in intensity and needs attention in almost half of the patients to relief the suffering.

## ACKNOWLEDGEMENT

I want to pay special thanks to my staff, Mr Irfan and Mr Faisal for help during upper GI endoscopy and EVBL. They fully participated in gathering the data as well.

## CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

## REFERENCES

1. Lebrec D, de Fleury P, Rueff B. Portal hypertension, size of esophageal varices and risk of gastrointestinal bleeding in alcoholic cirrhosis. *Gastroenterology* 1980; 79: 1139-44.
2. Garcia-Tsao G, Sanyal AJ, Grace ND, Carey WD, and the practice guidelines committee of the American Association for the study of liver diseases, the practice parameters committee of the American College of gastroenterology. Prevention and management of gastro esophageal varices and variceal hemorrhage in cirrhosis. *Am J Gastroenterology* 2007; 102(9): 2086-102.
3. Sarin SK, Sachdev G, Nanda R, Chari S, Anand BS, Broor SL. Comparison of the two time schedules for endoscopic sclerotherapy: a prospective randomised controlled study. *Gut* 1986; 27: 710.
4. Geraci G, Arnone E, Lo Nigro C, Sciuto A, Modica G, Sciumè C, et al. Endoscopic rubber band ligation in treatment of esophageal varices bleeding. Personal experience. *G Chir* 2011; 32(3): 113-7.
5. Zhou JN, Wei Z, Sun ZQ. Risk factors for early rebleeding after esophageal variceal ligation in patients with liver cirrhosis. *Zhonghua Gan Zang Bing Za Zhi* 2016; 24(7): 486-92.
6. Dai C, Liu W, Jiang M, Jun Sun M. Endoscopic variceal ligation compared with endoscopic injection sclerotherapy for treatment of esophageal variceal hemorrhage: A meta-analysis. *World J Gastroenterol* 2015; 21(8): 2534-41.
7. Sarwar S, Khan AA, Alam A, Butt AK, Shafqat F, Malik K, et al. effect of band ligation on portal hypertensive gastropathy and development of fundal varices. *J Ayub MedColl Abbottabad* 2006; 18(1): 32-5.
8. Pain Intensity Instruments, National Institutes of Health. Warren Grant Magnuson Clinical Center, July 2003. Archived from the original (PDF) on 2012.
9. Coelho FF, Perini MV, Kruger JAP, Fonseca GM, Araújo RLC, Makdissi FF et al. management of variceal hemorrhage: Current Concepts (Review article). *ABCD Arq Bras Cir Dig.* 2014; 27(2): 138-44.
10. Kapoor A, Dharel N, Sanyal AJ. Endoscopic diagnosis and therapy in gastro-esophageal variceal bleeding. *Gastrointest Endosc Clin N Am* 2015; 25(3): 491-507.
11. Chen WT, Lin CY, Sheen IS. MELD score can predict early mortality in patients with rebleeding after band ligation for variceal bleeding. *World J Gastroenterol* 2011; 17: 2120-5.
12. Harras F, Sheta el S, Shehata M. Endoscopic band ligation plus argon plasma coagulation versus scleroligation for eradication of esophageal varices. *J Gastroenterol Hepatol* 2010; 25: 1058-65.
13. Cordon JP, Froilan C, Torres, García AB, Rodriguez FG, J Suárez de Parga JM. Endoscopic management of esophageal varices. *World J Gastrointest Endosc* 2012; 4(7): 312-22.
14. Schoonbroodt D, Zipf A, Jung M. Local necrosis and fatal perforation of oesophagus after endoscopic ligation. *Lancet* 1994; 344: 1365.
15. Merchea A, Cullinane DC, Sawyer MD, Iqbal CW, Baron TH, Wigle D, et al. Esophago - gastroduodeno - scopy - associated gastrointestinal perforations: a single-center experience. *Surgery* 2010; 148(4): 876-80; discussion 881-2.
16. Vitte RL, Eugene C, Fingerhut A. Fatal outcome following endoscopic fundal variceal ligation. *Gastrointest Endosc* 1996; 43: 82.
17. Tachibana I, Yoshikawa I, Sano Y. A case of mesenteric venous thrombosis after endoscopic variceal band ligation. *J Gastroenterol* 1995; 30: 254.
18. Hyder A, Akif Dilshad D, Sarwar S, Alam A, Anwaar A Khan, Kamal Butt A. Comparison of Single verses multiple session band ligation for the treatment of bleeding esophageal varices. *JAMC* 2015; 27(1): 212-5.
19. Sengupta JN. An overview of esophageal sensory receptors. *Am J Med* 2000; 108 Suppl4a: 87S.
20. Steigmann GV. Endoscopic management of esophageal varices. *Endoscopic surgery*. Philadelphia: WB Saunders 1996: 113-124.
21. Hou MC, Lin HC, Liu TT. Antibiotic prophylaxis after endoscopy therapy prevents rebleeding in acute variceal hemorrhage: A randomized trial. *Hepatology* 2004; 39: 746-53.
22. Hobson AR, Furlong PL, Sarkar S, Matthews PJ, Willert RP, Worthen SF et al. Neurophysiologic assessment of esophageal sensory processing in noncardiac chest pain. *Gastroenterology* 2006; 130(1): 80-8.