

Modified 'Barrel Only' Technique for Endoscopic Variceal Ligation: A Comparative Study

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ABSTRACT

Introduction: Endoscopic Variceal Ligation (EVL) is an established procedure in the management of acute variceal bleeding and in prophylaxis of variceal bleeding. In standard technique, ligator handle is used to pull trigger cord to apply EVL bands. Winding of trigger cord over the control handle is time consuming. In modified 'barrel only' method, loading catheter is passed directly into the biopsy channel through the rubber cap with flap on without using ligator handle. Bands are applied by pulling the trigger cord directly with hand. It is proposed that by avoiding the use of control handle, procedure time will reduce significantly without compromising efficacy. Aim of this study was to compare the procedure time in modified method and standard method for EVL.

Material and Methods: Fifty patients with cirrhosis undergoing EVL were enrolled into modified method. Another 50 cirrhotic patients who were undergoing standard EVL acted as controls. Time duration was recorded from the point of introduction of loading catheter into biopsy channel till the endoscope was ready for EVL. Release of multiple bands on single trigger during each procedure was also noted.

Results: Mean time taken to load the endoscope with banding device in modified method arm was 80.5 seconds (range 60-104 seconds) and 210 seconds (range 160- 315 seconds) in standard method arm. On an average modified method saved 129.5 seconds per procedure. Release of multiple bands on single trigger happened 6 times in modified method arm and 5 times in standard method arm.

Conclusion: Modified method for EVL is quicker and effective in ligating esophageal varices as compared to standard EVL method.

Keywords: EVL, Variceal Ligation, Variceal Bleed

INTRODUCTION

Variceal bleeding is a life threatening complication of cirrhosis of liver.^{1,2} Endoscopic Variceal Ligation (EVL) is an established effective procedure in the management of acute variceal bleeding.^{3,4} EVL is also effective in secondary prophylaxis of variceal bleeding.^{5,6} Endoscopic Sclerotherapy (EST) used previously to tackle bleeding esophageal varices was quick but was associated with troublesome complication.⁷⁻¹⁰ EVL leads to much lesser complications as compared to EST and is equally effective.¹¹⁻¹⁴ The technique of EVL is fairly standard and has not changed much over the years. In standard technique, ligator handle is attached over the biopsy channel port and loading catheter is passed through its opening into the biopsy channel. Catheter is retrieved from the leading tip of endoscope and trigger cord is attached to it. Catheter along with trigger cord is withdrawn from opening of control handle. The barrel on the other end of trigger cord is attached to the tip of the endoscope. Trigger cord is placed in the slot in the spool of the control handle. The cord is pulled slowly in the slot till the knot is seated into it. The handle is rotated until all the redundant cord

is wound over the spool and is taut (figure 1). While winding one must be careful to avoid triggering of band.

Modified 'barrel only' method: In this method loading catheter is passed directly into the biopsy channel through the rubber cap with flap on without using ligator handle. End of trigger cord is attached to the loading catheter and catheter is withdrawn and retrieved from the biopsy channel port. Endoscope loaded with

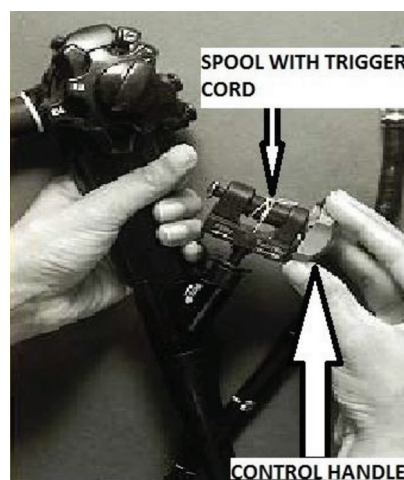


Figure-1: Standard EVL method with use of control handle to pull trigger cord.



Figure-2: Technique to pull trigger cord without using ligator handle in modified 'barrel only' method

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How to cite this article: Kumar A. Modified 'barrel only' technique for endoscopic variceal ligation: a comparative study. International Journal of Contemporary Medical Research 2017;4(2):501-503.

	Standard method	'barrel only' method
Number of patients	50	50
Mean age	52.7	51.4
Male: Female ratio	2.57: 1	1.94: 1
Patients with acute bleeding	11	39
Patients for prophylactic EVL	10	40
Time consumed	210 seconds	80.5 seconds
Number of unintentional release of EVL bands	5	6

Table-1: Demographic details and study result details.

barrel is inserted into esophagus in usual manner and varix is sucked into the barrel till red out is seen. Trigger cord is pulled gently till there is feeling of giveaway indicating application of one band. Pull is ceased immediately (figure 2). All the varices are tackled in similar manner. It was observed that significant time is lost while attaching the control handle and winding the redundant cord over the spool. This time can be saved by adopting 'barrel only' technique as described above. Aim of the study was to compare the procedure time in standard technique and in modified 'barrel only' technique.

MATERIAL AND METHODS

Comparison was made between standard EVL method and modified method in 100 patients of cirrhosis who were undergoing EVL in endoscopy department of our institute. Informed consent for the procedure was obtained from each patient. All patients presenting with acute variceal bleeding were resuscitated well and were hemodynamically stable before being taken up for UGIE. Prior upper gastrointestinal endoscopy (UGIE) was performed in all patients to assess the variceal size and need for EVL. Patients with significant varices were enrolled into standard method arm and modified 'barrel only' technique arm. Each arm had fifty patients. During EVL procedure, time duration was recorded with the help of assistant from the point of introduction of loading catheter into biopsy channel till the endoscope was ready for EVL (beyond this point procedure is same and hence time was not recorded). EVL procedure was completed in usual manner in all patients. Release of multiple bands on single trigger during each procedure was also noted.

RESULTS

Mean age was 51.4 and 52.7 years in modified method arm and standard method arm respectively. All patients had cirrhosis due to various etiologies. There were 36 males and 14 female in standard arm group (male: female ratio= 2.57: 1). In modified method arm there were 33 males and 17 females (male: female ratio= 1.94: 1). There were 11 patients with acute variceal bleed in standard arm. Rest of the patients underwent prophylactic EVLs. In modified method arm 10 had acute variceal bleeding and 40 patients were coming for prophylactic EVLs. All varices in each patient were tackled in both the arms. Mean time taken to load the endoscope with banding device in modified method arm was 80.5 seconds (range 60-104 seconds) and 210 seconds (range 160- 315 seconds) in standard method arm. On an average modified method saved 129.5 seconds per procedure. Release of multiple bands on single trigger happened 6 times in modified method arm and 5 times in standard method arm.

DISCUSSION

An endoscopic variceal banding device was initially introduced in 1986.³ Endoscopic band ligation is now established as standard therapy for the management of bleeding esophageal varices.^{4,6} It is effective in control of acute variceal bleeding. In secondary prophylaxis EVL is associated with similar efficacy and reduced complications.^{13,14} Technique of variceal band ligation has changed little over decades. As compared to endoscopic sclerotherapy (EST), standard EVL technique is cumbersome and time consuming.¹² This is mainly due during loading of endoscope with banding device. During loading of endoscope bulk of time is consumed in fitting the ligator handle and winding of trigger cord over the spool. This time can easily be saved by avoiding the use of ligator handle. This study is highlighting an innovation by which EVL technique can be simplified without losing efficacy and other benefits of EVL. Modified technique is quicker in loading the endoscope and effective in application of bands. In modified method loading time is significantly shorter and one can save 129.5 second per procedure. Technique is easier to learn and user friendly. Modified technique is more time consuming than EST and need repeat endoscopy. But EVL is associated with lesser post procedure complications.

Unintended multiple band release on single trigger was only slightly more with newer method. This study was conducted by single operator; so inter operator comparison was not performed. Further studies may be conducted involving multiple operators to investigate the inter operator variability regarding procedure time and unintentional firing of multiple bands. Nevertheless, it may be safe to presume that 'modified 'barrel only' technique is likely to be quicker because of time saved in attaching the ligator handle. Learning curve for this technique is likely to be dwarf and short as it is simple and involves lesser equipments and steps of procedure. Only difficulty in technique is to learn the feel of release of band on gentle pull of trigger cord. If one does not stop on the giveaway feel after gentle pull of trigger cord, one may risk firing multiple bands. The giveaway feel of release of band is easy to recognize and firing of multiple bands was not common.

Formal cost analysis of both techniques was not done in this study. However by comparing the market price of complete EVL kits and EVL barrels, "barrel only' technique' is likely to be much cheaper. This technique may cut the cost of procedure in those endoscopy centers where ready to use EVL kits are being used. But if one use EVL barrel with re usable ligator handle, cost benefit is not much. Idea of this study was to highlight the innovation by which we can make EVL technique simple and quicker without losing efficacy.

Packing material used to pack the barrel was much less as compared to the standard EVL kits available commercially.

Therefore 'Barrel only' technique is likely to reduce the biomedical waste generated from packing material in those centre where complete EVL kits are being used routinely for variceal ligation. The impact may be significant in large endoscopy centers where large numbers of EVLs are being performed. The technique may be environment friendly in long run especially if it is adopted by large centers.

CONCLUSION

The proposed modified method for EVL is quick and effective in ligating the esophageal varices.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 01-02-2017; **Published online:** 14-03-2017