Efficacy and Safety of Colonoscopic Band Ligation for Lower Gastrointestinal Bleeding due to Hemorrhoid

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ABSTRACT

Background: Lower gastrointestinal bleeding is a significant cause of morbidity and mortality. Hemorrhoids are frequently encountered cause of lower gastrointestinal bleeding in outpatient settings in Nepal. Rubber band ligation is one of the most important, cost-effective, and commonly used treatments for first to third-degree internal hemorrhoids. Colonoscopic Rubber band ligation provides enhanced visualization and maneuverability, improving safety and efficacy of Rubber band ligation compared to traditional Rubber band ligation methods. This study aimed to assess the safety, efficacy, and patient acceptance of Colonoscopic Rubber band ligation for lower Lower gastrointestinal bleeding due to hemorrhoids.

Methods: This study, conducted in a tertiary care center of Nepal over one year, explores the immediate, late complications, efficacy and treatment satisfaction of patients undergoing Colonoscopic Rubber band ligation for lower GI bleeding due to hemorrhoids.

Results: We included 28 among 108 patients presenting to the surgical outpatient department with Lower gastrointestinal bleeding. Symptoms of irritation, discharge, pain resolved in all patients at 3 months and that of bleeding and prolapse in 96.4% and 92% respectively. 75% were able to resume work the day after the procedure. Post-procedure complications were reported in 53.5% of cases. 78.6% of patients rated Colonoscopic Rubber band ligation treatment as "excellent help".

Conclusions: Colonoscopic Rubber band ligation is feasible, safe and efficient for the treatment of symptomatic grade II hemorrhoids with most patients experiencing relief and high satisfaction. Further multicenter research with longer follow-up is needed to confirm long-term effectiveness.

Keywords: Colonoscopy; hemorrhoids; per rectal bleeding; rubber band ligation procedure.

INTRODUCTION

LGIB is one of the most common presentations in surgical OPD.[1] Colonoscopy plays a crucial role in diagnosing etiology of LGIB. Hemorrhoids are a common cause of LGIB encountered in surgical OPD in Nepal.[2] In the 1950s, Blaisdell described the ligation of bleeding internal hemorrhoids (IH) using silk suture that could be performed in the outpatient setting which was later modified and simplified using rubber bands by Barron in the 1960s.[3,4] Since then, rubber band ligation was established as one of the most important, cost-effective, and commonly used treatments for first- to third-degree internal hemorrhoids, causing fibrosis, retraction, and fixation of the hemorrhoidal cushions.[4,5] Performing RBL with aid of colonoscopy, colonoscopic rubber band ligation (CRBL) offers advantages over conventional methods, including diagnosis of associated conditions of LGIB, enhanced maneuverability, and photographic documentation capabilities. Till date, there is no data on colonoscopy guided RBL for hemorrhoids treatment at our context. This study aims to evaluate the safety, efficacy, and patient satisfaction of CRBL in managing LGIB associated with hemorrhoids.

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METHODS

This cross-sectional study was conducted enrolling consecutive patients presenting to the surgical OPD of B.P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal with LGIB due to hemorrhoids from January 1, 2019, to January 1, 2020. Ethical clearance was obtained, and patients meeting inclusion criteria i.e. having grade III or lower hemorrhoids confirmed via proctoscopy and providing consent were included. Exclusion criteria included prior diagnoses of other anorectal diseases, prior band ligation or other treatment for hemorrhoids, immuno-compromised status, local or systemic infection or patients with a bleeding disorder and grade IV internal hemorrhoids (IH). The diagnosis of hemorrhoids was made from symptoms, examination in a prone jackknife position and the appearance observed during proctoscopy. Patients were counseled about the conventional and colonoscopic band ligation. Patients who opted for colonoscopic band ligation subsequently attended the procedure on a specified date, accompanied by someone to drive them home, and have started a course of laxative.

The procedure involved attaching a transparent plastic colonoscopic ligation cap to the top of a colonoscope and performing ligation 2 to 5 mm above the dentate line. A single band was released per IH. In a session maximum of 3 bands was applied as this procedure takes fewer sessions for eradication of hemorrhoids. Following CRBL, all the patients were observed for immediate post-procedure complications for 1 hour and discharged on the same day unless complications occurred. Lifestyle modifications including adequate fiber supplements, water, fruits along with bulk laxatives, and sitz bath in the first week after banding and oral pain medications including tablet diclofenac sodium 50 mg and/or tramadol hydrochloride as needed were prescribed. Patients were followed up after 7 days, 1 month, 3 months, and follow-up was complete in all patients. During follow-up, the cases were assessed for post procedure discomfort, the need for analgesics to alleviate post-procedure pain and the duration of time taken off work. The impact of CRBL on symptom improvement was evaluated based on bleeding, pain, prolapse, irritation, and mucous discharge. Statistical analysis involved graphical methods, calculation of frequency, percentage, mean, and standard deviation, and data analysis using SPSS 21.0. A p value of less than 0.05 was considered significant.

RESULTS

A total of 108 patients presented to the Surgical OPD with LGIB attributed to hemorrhoids among which CRBL of hemorrhoids was performed in a total of 28 patients. The mean age of the patients was 49.32 years (Range, 22 to 84 years). There were 67.9% (n=19) males, male-to-female ratio being 2.1:1. The most common symptom was per rectal bleeding in all patients, followed by prolapse in 46.4% (n=13), pain in 42.9% (n=12), irritation in 17.9% (n=5), and discharge in 7.1% (n=2) (Table 1). Majority of cases had grade II hemorrhoids (96.4%, n=27) except one with grade III hemorrhoid. All patients underwent screening colonoscopy before CRBL where 14.3% (n=4) were found to have associated coexisting pathology (Table 1).

Table 1. Clinical profile of patients.

Parameter	Number (n)	Percentage (%)
Presenting symptoms		
Bleeding	28	100
Prolapse	13	46.4
Pain	12	42.9
Irritation	5	17.9
Discharge	2	7.1
Bowel habits		
History of constipation	6	21.4
History of straining at stools	16	57.2
Diet		
Low fiber	21	75
High fiber	7	25
Family history of hemorrhoids	11	39.3
Hemoglobin levels <10 gm%	5	17.9
Occupation		
Manual laborers	16	57.1
Sedentary workers	12	42.9
Screening colonoscopy findings		
Colitis	2	7.1
Proctitis	1	3.6
Rectal polyp	1	3.6

Symptoms of irritation, discharge and pain resolved in all patients after CRBL at 3 months. Likewise bleeding and prolapse resolved in 96.4% and 92% respectively at 3 months. Bleeding and prolapse resolved in almost all cases, except one who developed mucosal edema alongside persistent bleeding symptoms (Table 2).

Table 2. Effect of CRBL on symptom.

Symptoms	At presentation		At 1st week		At 1 month		At 3 month	
	No.	%	No.	%	No.	%	No.	%
Irritation	5	17.9	-	-	-	-	-	-
Discharge	2	7.1	-	-	-	-	-	-
Pain	8	28.6	1	3.6	-	-	-	-
Bleeding	28	100	4	14.3	1	3.6	1	3.6
Prolapse	13	46.4	1	3.6	1	3.6	1	3.6

Immediately following CRBL, 15 patients (53.5%) encountered immediate post-procedure complications among which discomfort was the predominant symptom followed by pain and bleeding (Table 3). Pain was mild in two cases (7.1%) effectively managed with oral analgesics, while one case (3.6%) presented with severe pain and minimal bleeding, necessitating hospital admission and intravenous analgesic management. The bleeding resolved spontaneously without further intervention. During follow-up visits, the majority of patients (57.1%, n=16) reported no discomfort. Among the cases experiencing discomfort, the most common duration of discomfort was 1-2 days (Table 3). The majority of patients (89.2%) did not require analgesics post-procedure (Table 3).

Table 3. Post-procedure complications.

Complications	Number of cases	Percentage
Immediate post-procedure complications		
Discomfort	12	42.9
Pain	3	10.7
Bleeding	1	3.5
Post ligation discomfort		
No	16	57.1
1-2 days	7	25
3-6 days	2	7.1
≥7 days	3	10.7
Requirement of pain relief		
None	25	89.2
1-3 days	2	7.1
> 3 days	1	3.7

The majority of patients (75%, n=21) were able to resume work the day after the procedure. Four cases (14.3%) took 1-3 days off work due to vague discomfort, while three cases (10.7%) required more than 4 days off work for various reasons. One case necessitated hospital admission, and two cases required a repeat session of banding. The majority of cases (78.6%, n=22) rated the treatment as excellent. 17.9% (n=5) of patients who had residual symptoms assessed the treatment as of moderate help.

DISCUSSION

Most patients receiving CRBL were in fifth and sixth decades of life which aligns with previous studies showing a higher prevalence of hemorrhoids in individuals between the ages of 40 and 60. This may be due to weakening and loss of elasticity of the connective tissues supporting the hemorrhoidal veins with age.[6] There was a higher prevalence in males and in manual laborers. This finding is consistent with prior studies that have also observed a male predominance in hemorrhoids.[7] Men are more likely to engage in activities that can increase hemorrhoid risk, such as heavy lifting and straining during bowel movements, occupations that involve prolonged periods of sitting or standing. This could also be due to underreporting by females given the sensitiveness of

the topic leading to an underestimation of hemorrhoid prevalence in females. One in every three cases had a family history of hemorrhoids, which is supported by Graham Stewart's theory of familial tendency due to generalized weakness of venous walls due to hereditary predisposition.[8] It's also important to note that family history could also be influenced by shared lifestyle habits within families, such as diet or physical activity, which can also contribute to hemorrhoids. Three-quarters reported a low-fiber, mostly non-vegetarian mixed diet. Constipation was seen in one-quarter and straining was seen in half of cases suggesting that even without constipation, some people may be straining due to other factors, such as low-fiber diet leading to hemorrhoids.[5,9] Anemia was observed in 18% of cases, a prevalence similar to that reported in previous studies.[10] Chronic bleeding from hemorrhoids, especially internal hemorrhoids, can lead to iron deficiency anemia.

The highest improvement rate observed was for symptoms of irritation and discharge after CRBL, followed by pain, bleeding, and prolapse. Persisting bleeding and prolapse were observed in only one patient who had grade III hemorrhoids and subsequently underwent open hemorrhoidectomy after 3 months of ligation. The success rates observed (except for the one patient) are consistent with previous research on RBL effectiveness.[11-13] These suggest that CRBL may not be as effective as hemorrhoidectomy in treating large hemorrhoids that require manual reduction, particularly those classified as grade III.[10] While the majority of patients experienced significant improvement in their symptoms and rated the treatment outcomes as excellent, it's important to acknowledge that individual responses to treatment can vary. In cases where symptoms persist or worsen despite initial treatment, alternative interventions may be necessary to achieve optimal outcomes emphasizing the need for a personalized approach to hemorrhoid treatment.

Half of the patients reported complications immediately following CRBL which is lower compared to previous studies.[14,15] The higher complication rates in the prior studies may be attributed to the application of multiple bands during the procedure. Likewise, utilization of colonoscopy techniques permitted in the visualization of the hemorrhoids, better maneuverability of the instruments, and enhanced accuracy in band placement, all of which could minimize tissue trauma and post-procedural discomfort. No major complications were reported among our patients. While major complications such as severe hemorrhage, sepsis, vasovagal reflex, and even death, have been documented in rare cases, their absence in our study may be attributed to the smaller sample size and colonoscopy-guided BL allowing for real-time visualization of the hemorrhoids and precise placement of the bands, reducing the risk of inadvertent trauma to surrounding tissue and structures.[4,16,17] The majority of patients reported no need for post-procedure analgesics, did not require any days off work, and experienced minimal to no discomfort during follow-up visits. This outcome represents a significant advantage compared to hemorrhoidectomy, a more invasive procedure known to involve surgical excision of hemorrhoidal tissue.[10,18,19] The favorable outcomes observed with CRBL can be attributed to the minimally invasive nature of CRBL that minimizes tissue trauma, leading to reduced post-procedural pain and discomfort. Additionally, the implementation of comprehensive post-procedural care strategies aimed at optimizing patient comfort and promoting healing likely played a crucial role. Patients were advised to adopt lifestyle modifications, including dietary changes such as increased fiber intake, adequate hydration, and the use of fiber supplements. These modifications help prevent constipation and reduce the risk of exacerbating hemorrhoidal symptoms.

This study was conducted at a single center and long-term post-operative lifestyle adjustment was not controlled or followed up in our study. A multicentric study with long term follow-up is needed to evaluate the efficacy of rubber band ligation in management of grade II and grade III hemorrhoids.

CONCLUSIONS

CRBL is particularly effective for grade II hemorrhoids, with most patients experiencing significant symptom improvement and high satisfaction. Complications were minimal and post-procedural discomfort was low. Future multicentric studies are warranted to evaluate long term effectiveness of CRBL efficacy in various patient populations of treatment and direct comparisons between CRBL and other hemorrhoid treatments are warranted to explore this potential benefit more comprehensively.

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None

CONFLICT OF INTEREST

There are no conflicts of interest.

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