

Clinical Evaluation of Modified Band Ligation for Treating Second-Degree Hemorrhoids in A Tertiary Care Centre

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Abstract

Background: Hemorrhoids are a common anorectal disorder affecting a large proportion of adult male population, and sometimes are associated with non-painful bleeding and prolapse on defecation (second degree). One of the commonly used minimally invasive therapeutic modalities is rubber band ligation (RBL). Band ligation procedures have been modified to enhance their efficacy, reduce their recurrence and minimize problems. This study aims to assess the efficacy and safety of the modified band ligation procedure in cases of second degree and higher hemorrhoids. **Material and Methods:** The materials and methods involved in this were a prospective observational study which continued for a 10-month period, including 55 patients with second-degree hemorrhoids at the department of General Surgery, a tertiary care hospital. The modified band ligation was performed in both groups of participants according to standard protocol. Demographic data, clinical presentation, surgical findings and early and late postoperative complication rates were collected. The patients' responses were measured in terms of pain, bleeding, recurrence, complications, and satisfaction. Follow-up assessment occurred 1, 1, 3, and 6 months after the procedure. Appropriate statistics were used to analyze the data and the P value < 0.05 was the significant value. **Results:** Of 55 patients, who were mainly male (60%), the mean age was 42.3 ± 11.5 years. Painless rectal hemorrhage (87%) was the most common presenting symptom followed by intermittent prolapse during feces (60%). In all patients, modified band ligation was performed successfully, in the mean time of 8 ± 2 minutes. There was moderate and brief postoperative pain in 45 (82%) patients and only 10 (18%) required analgesics for more than 48 hours. There were minor complications, which included bleeding that resolved spontaneously in 7 patients (12.7%) and urine retention in 2 patients (3.6%). No serious complications such as severe pain, septic or thrombosed hemorrhoids were reported. Of the 3 (5.4%) patients who did recur at the 6-month follow-up, they were successfully treated with repeat band ligation. Patient satisfaction was high at 90%, from good to outstanding. **Conclusion:** Modified band ligation is safe, effective, and minimally invasive treatment of 2nd degree hemorrhoids. It has high patient satisfaction, fewer complications and a low recurrence rate. It offers an alternative practical outpatient procedure alternative for patients who wish for rapid recovery, and a reduced procedural morbidity.

Keywords: Hemorrhoids, Modified Band Ligation, Outpatient Procedure, Rubber Band Ligation, Treatment.

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INTRODUCTION

The patients often suffer from painless rectal bleeding, proctolysis, discomfort, itching or all of these symptoms; haemorrhoids are more prevalent in the age group from 45 to 65 years, and factors contributing to haemorrhoids include chronic constipation, straining bowel movements, prolonged sitting, pregnancy, obesity and sedentary lifestyle.^[1-4]

Hemorrhoids can be classified based on their location and size. Hemorrhoids located above the dentate line are called internal hemorrhoids and tend to be not very painful because of their visceral innervation, while those below the dentate line are known as external hemorrhoids and are often painful from their somatic innervation.^[5,6]

Depending on the extent of prolapse, internal hemorrhoids are graded as I to IV. Hemorrhoids that prolapse when bowel movements occur, but retract to their normal position, are considered to be of the second degree and are often associated with rectal bleeding not all the time. Conservative treatment, including diet modification, dietary fibre, stool softeners, and lifestyle modification, can reduce minor

symptoms, but for recurrent or persistent symptoms, or when symptoms are problematic, a procedure will be required.^[7,8]

Rubber band ligation (RBL) is a widely accepted, minimally invasive outpatient procedure suitable for the treatment of internal hemorrhoids, particularly for second degree hemorrhoids,^[10] which involves tying a constricting rubber band at the base of the haemorrhoidal cushion, causing ischemia necrosis, sloughing of tissue and subsequent fibrosis to bind the mucosa to the underlying sphincter complex, and reducing a risk of prolapse or haemorrhoidal bleeding.

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Traditional RBL has a number of advantages: it is easy to use, highly effective, minimally invasive, low risk, and avoids the use of general anesthesia. It is simple and cost-effective and can be done in the outpatient setting, making it a preferred option for patients and healthcare professionals.^[10,11]

Although successful, conventional RBL has some drawbacks as are postoperative discomfort, bleeding, thrombosis of hemorrhoidal tissue and occasional recurrence. These concerns have been addressed by modifying the band ligation techniques. The enhancements aim to enhance optimization of band placement, increase hemostasis, minimize damage to adjacent tissues and facilitate comfort for the patient.^[11]

Successful positioning in the operating room, direct visualization, adjustments to band tension and selective clamping of only the problematic haemorrhoidal cushions have been documented as techniques that reduce postoperative discomfort and recurrence. There are multiple studies that suggest that modified band ligation results in better outcomes when compared to traditional band ligations, but there are few studies to assess the effectiveness of modified band ligation with regard to the second degree hemorrhoids, particularly amongst the Indian population.

Aims and Objectives: To evaluate the effectiveness and safety of modified band ligation in patients with second-degree hemorrhoids.

MATERIALS AND METHODS

A prospective observational study was conducted in Department of General Surgery, SreeMookambika Institute of Medical Sciences, Kulasekharam for 10 months. Fifty-five patients diagnosed with the presence of 2° internal hemorrhoids by clinical exam were studied. The patients were recruited in consecutive order after obtaining informed consent.

Only patients with symptomatic second-degree hemorrhoids (age 18-70 years) were included in the study, while patients with concurrent anorectal conditions (fissures, fistulas, abscesses, malignancies), history of hemorrhoidal surgery, bleeding disorders, significant comorbidities, immunocompromised states, pregnant or lactating women were excluded.

Complete history taken for all patients including duration of symptoms, frequency of bleeding, pregnancy with prolapse, pain, itching and stool pattern. A thorough clinical assessment, including examination of the rectum with a digital rectal exam and examination of the anus with anoscopy, was performed to confirm the diagnosis and to determine the type of hemorrhoids. Routine blood tests (CBC, coagulation, blood glucose, and appropriate chemistry profiles) were obtained to determine the patients' suitability for surgery. The patients were informed about the surgery,

the expected outcomes, risks and after surgery care.

Band ligations were made outpatient with local anesthetic. Patients were then laid on their side (in LA position) and the prolapsing hemorrhoidal cushions were examined using an anoscope. For the revised technique, the rubber band was accurately positioned beneath each hemorrhoid, with the goal of leaving as little adjacent mucosa involved as possible and avoiding overstretching the area which might lead to discomfort or rubber band slippage. Where multiple hemorrhoidal cushions were impacted, selective ligation was performed on the affected ones, to prevent discomfort and to shorten the procedure. All aseptic precautions were adhered to.

Immediate complications (such as bleeding, urinary retention, or severe pain) were promptly assessed after the procedure and analgesics and stool softeners were given if needed. Advised them about dietary changes, dietary fibre intake, adequate fluid intake, and avoiding straining on defecation. Symptom remission, procedure-associated complications, and recurrence were evaluated at 1 week out, 1 month out, 3 months out, and 6 months out following the procedure. Postoperative discomfort, bleeding, recurrence of prolapse, patient satisfaction and complications were documented.

The data of all the patients were collected on a structured proforma. Visual analog scale was used for evaluation of pain and complications were recorded according to the standards. Recurrence was considered to be the appearance of symptomatic hemorrhoids at the site of previous ligature. Subjective reports were used as a measure of patient satisfaction at follow-up visits. Data were then analyzed using the SPSS version 20.0. The quantitative variables were expressed as mean $\pm$ SD and the categorical ones were expressed as frequency (%). Results were compared using the proper statistical procedures, and p-value less than 0.05 was regarded as statistically significant.

RESULTS

Among the 55 patients, 33 (60%) were males and 22 (40%) were females, with a male-to-female ratio of 1.5:1. The age of the patients ranged from 22 to 68 years, with a mean age of 42.3 ± 11.5 years. The majority of patients (45%) were in the 31–45-year age group, followed by 35% in the 46–60-year age group, and 20% above 60 years.

The most common presenting symptom was painless rectal bleeding, reported in 48 patients (87%), followed by prolapse during defecation in 33 patients (60%). Pruritus and soiling were noted in 20 (36%) and 15 (27%) patients, respectively.

Modified band ligation was successfully performed in all patients. The average procedure time was 8 ± 2 minutes. Postoperative pain was mild in the majority of patients, with 45 patients (82%) experiencing minimal discomfort managed with oral analgesics for 1–2 days. Ten patients (18%) reported moderate pain requiring analgesics for more than 48 hours. [Table 1]

Table 1: Postoperative Pain (n = 55)

Pain Severity	Number of Patients (n)	Percentage (%)
Mild	45	82
Moderate	10	18
Severe	0	0

The procedure was associated with a low complication rate, and all complications were minor and self-limiting. [Table 2]

Table 2: Postoperative Complications

Complication	Number of Patients (n)	Percentage (%)
Transient bleeding	7	12.7
Urinary retention	2	3.6
Severe pain	0	0
Infection	0	0

During a six-month follow-up, 3 patients (5.4%) experienced recurrence of symptomatic hemorrhoids, all of whom were successfully managed with repeat band ligation. The

recurrence rate was low, demonstrating the efficacy of the modified band ligation technique. [Table 3]

Table 3: Recurrence Rate

Outcome	Number of Patients (n)	Percentage (%)
No recurrence	52	94.6
Recurrence	3	5.4

Patient-reported satisfaction was high, with 90% of patients reporting good to excellent outcomes, reflecting favorable

outcomes in terms of symptom relief and recovery. [Table 4]

Table 4: Patient Satisfaction

Satisfaction Level	Number of Patients (n)	Percentage (%)
Excellent	30	55
Good	20	36
Fair	5	9
Poor	0	0

DISCUSSION

In the present study, 60 patients having symptoms of second degree hemorrhoids were evaluated. The demographic profile showed predominance of male patient (60%) and majority (45%) of patients belonged to 31 to 45 years. This finding supports earlier research that found hemorrhoids were more common in men than in women, often attributed to their lifestyles, such as excessive sitting, occupation-related stress, diet low in fiber and chronic straining, which contributes to a distended anal cushion.

Other studies found conflicting results, in which females made up 60% of Oberi IA et al,^[12] study population, and they recognized inadequate physical activity (83%), sitting for long periods (51%), and a high fat intake (50%) as risk factors. A multifaceted etiology of haemorrhoidal diseases is highlighted by the fact that in spite of gender imbalance, there is a common presence of modifiable lifestyle risk factors.

Rectal bleeding, which occurred in 87% of the presentations, was the most common presenting symptom in the current study, followed by prolapse during defecation (60%), while pruritus and soiling occurred less frequently. These results match the common presentation of second degree hemorrhoids, where internal hemorrhoids are sensitised by the visceral nerves causing the predominant symptom to be bleeding without pain.

Similar findings were obtained by Al-Masoudi RO et al,^[13] who found that the symptoms to be of pain during defecation (76.2%), discomfort (63.5%) and swelling (55.6%). Likewise, Bek B et al,^[14] reported bleeding, prolapse and pain in a mostly male population (83.7%), mostly aged 30–40 and of low socioeconomic status.

In all cases in the current study, an RBL procedure was performed successfully with an average of 8 minutes. Most of the pain after the surgery was moderate, and 82% of patients found the pain was not severe enough to warrant a longer-acting drug to control it. There was no significant pain in any individual, reflecting the patient comfort afforded because of the new band positioning with targeted closure of problematic cushions to minimize mucosal injury. These findings are consistent with Ahmed M et al,^[15] which reported that 88% of patients had relief from symptoms after RBL, with 31.6% having bleeding, 21% a sense of discomfort, 18% edema, and 5% dislodging of the band as an occult minor and self-limiting complication.

The present study encountered minor and transient problems, such as hemorrhage (12.7%) and less urine retention (3.6%), without reporting any case of infection, thrombosis, or chronic pain. The low complication rate further confirms the safety of the modified RBL procedure and reinforces the use of this operation as an outpatient procedure. Similar safety profile was noted by Ratan R et al,^[16] which resulted in symptom resolution in 89% patients, and pain was the most common adverse event in the short-term. Likewise, Kumar M et al,^[17] noted 89% symptomatic relief achieved after RBL for grade II–III hemorrhoids substantiating it as a simple, safe and cheap daycare surgery with minimal requirement of analgesics.

In this follow up trial, the recurrence rate was 5.4% (three patients with return of symptoms that were well controlled with repeat ligation). Consistent with this, Yu J et al,^[18] reported a recurrence rate of 5.4% in the modified RBL group vs. 13.6% in the traditional group ($p < 0.05$) and very low postoperative complication rates for the modified RBL group. Nevertheless, the long-term outcomes reported by Komporzozos V et al,^[19] show that RBL can be long-lasting with 84.5% of cases remaining

asymptomatic at 2 years after the procedure, although 15.5% of the cases recurred, usually treated with another banding. The present research showed that high percentage (90%) of patients were satisfied with the results, ranging from good to excellent. This is proof of the effectiveness of the procedure in symptom management, minimal discomfort and positive recovery properties. Sadik D et al,^[20] reported similar satisfaction with 90% of patients saying that they would like to go through the surgery again, which shows the surgery is both accepted and effective in improving quality of life. Nikam V. et al,^[21] reported higher efficacy with grade II hemorrhoids (88%) as compared with grade III (31.6%) and had low complications rates and found that anemia was relieved after successful ligation. These observations are consistent with those of the present investigation in which the best result was obtained with the improved technique which gave better prolapse control and reduction of hemorrhage with low recurrence rates and high levels of satisfaction.

CONCLUSION

The band ligation, which has been modified, is a safe, effective and convenient procedure for the treatment of second degree piles. It provides more effective symptom relief, less postoperative discomfort, fewer complications and a low risk of recurrence. The high satisfaction level among patients and the expedient healing process further support its use as an out-patient surgery. The findings of this study show that the modified procedure is both safe and effective in the treatment of symptomatic 2° hemorrhoids and leads to sustained improvements without compromising patient safety or comfort.

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Conflicts of interest

There are no conflicts of interest.

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