International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 3, March 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.3.2025.174

ORIGINAL RESEARCH

A Perspective Clinical Study of Efficacy of Band Ligation in Treatment of second and Third degree Haemorrhoids

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Received: 15 February, 2025 Accepted: 27 February, 2025 Published: 25 March, 2025

ABSTRACT

Background: Hemorrhoids are a common anorectal condition affecting a large proportion of the adult population. Rubber band ligation (RBL) is a widely accepted non-surgical treatment for second- and selected third-degree hemorrhoids. This study aimed to evaluate the efficacy, patient satisfaction, and post-procedural outcomes of RBL in patients with second- and third-degree hemorrhoids. **Methods:** A prospective clinical study was conducted on 78 patients diagnosed with second- (n=46) and third-degree (n=32) hemorrhoids. Demographic data, clinical presentation, duration of hospital stay, patient satisfaction scores, and post-procedural complications were recorded and analyzed. Statistical significance was assessed using appropriate tests. **Results:** The majority of patients were middle-aged males, with bleeding per rectum being the most common symptom. Patients with second-degree hemorrhoids had significantly shorter hospital stays (mean 1.23 days) compared to third-degree (mean 1.89 days, $p<0.001$). Satisfaction scores were higher in second-degree cases (median score 7 vs. 5, $p<0.001$). Most complications were minor and self-limiting. One-month follow-up revealed minimal residual symptoms, low recurrence, and comparable need for repeat banding in both groups. **Conclusion:** Rubber band ligation is a safe, effective, and minimally invasive treatment for second- and selected third-degree hemorrhoids. It offers high patient satisfaction, especially in second-degree cases, with minimal complications and losw recurrence rates.

Keywords: Hemorrhoids, Rubber Band Ligation, Second-degree Hemorrhoids, Third-degree Hemorrhoids, Non-surgical Treatment, Patient Satisfaction, Clinical Efficacy.

INTRODUCTION

Hemorrhoids, also known as piles, are one of the most common anorectal disorders encountered in clinical practice, affecting nearly 4% of the adult population worldwide, with peak prevalence in individuals aged 45–65 years[1]. They result from pathological enlargement and distal displacement of the normal anal cushions and are classified into four degrees based on their prolapse and reducibility[2]. Second- and third-degree internal hemorrhoids, characterized by prolapse during defecation with spontaneous or manual reduction respectively, significantly impair quality of life due to symptoms such as bleeding, discomfort, pruritus, and prolapse[3].

Conservative treatments including dietary modifications, stool softeners, and topical agents offer symptomatic relief in early hemorrhoidal disease, but have limited effectiveness in higher-grade hemorrhoids[4]. Among the various minimally invasive treatment options, rubber band ligation (RBL) has emerged as a widely accepted and cost-effective technique, particularly suitable for second- and third-degree hemorrhoids[5]. It involves placing a rubber band at the base of the hemorrhoid, leading to ischemic necrosis and eventual sloughing of the ligated tissue, thereby resulting in fibrosis and fixation of the mucosa to the underlying muscular layer[^6^].

Several studies have demonstrated that RBL is associated with favorable outcomes, minimal post-procedure discomfort, low recurrence rates, and a shorter recovery period compared to surgical hemorrhoidectomy[7]. However, variations in technique, patient selection, and clinical setting can influence treatment efficacy. Moreover, the role of RBL in third-degree hemorrhoids, which often require manual reduction, continues to be debated due to

DOI: 10.69605/ijlbpr_14.3.2025.174

relatively higher recurrence and complication rates in some cohorts[8].

Given this context, the present study aims to assess the clinical efficacy and safety of rubber band ligation in the treatment of second- and third-degree internal hemorrhoids, thereby providing a perspective on its role as a first-line intervention in such cases.

MATERIALS AND METHODS

This prospective clinical study was conducted in the Department of General Surgery at Government Medical College (Singareni Institute of Medical Sciences, Ramgundam), over a period of 12 months. Ethical approval was obtained from the Institutional Ethics Committee prior to commencement of the study, and written informed consent was obtained from all participants.

Study Population

Patients attending the surgical outpatient department with symptoms suggestive of internal hemorrhoids were screened. Those diagnosed clinically and proctologically as having second and third-degree internal hemorrhoids were included in the study based on the following criteria.

Inclusion Criteria

- Age between 18 to 65 years
- Diagnosed with **second and third-degree internal hemorrhoids** (i.e., hemorrhoids that prolapse during defecation and reduce spontaneously)
- Willing to undergo rubber band ligation (RBL)
- Provided written informed consent

Exclusion Criteria

- Patients with first, and fourth-degree hemorrhoids
- Patients with associated anal pathologies (e.g., fissures, fistula, abscess)
- Known bleeding disorders or on anticoagulant therapy
- Immunocompromised patients
- History of prior surgical treatment for hemorrhoids
- Pregnant women

Sample Size

A total of 78 patients fulfilling the inclusion and exclusion criteria were enrolled consecutively in the study.

Procedure

All patients underwent rubber band ligation as an outpatient procedure using a Barron ligator. The procedure was performed without anesthesia. The patient was placed in the left lateral or lithotomy position, and a proctoscope was inserted to visualize the internal hemorrhoids. Using the ligator, one or more rubber bands were applied at the base of each hemorrhoidal mass above the dentate line. Patients were observed for a short duration post-procedure for any immediate complications and were given standard post-procedure care instructions.

Follow-Up

Patients were followed up at **1 week, and 4 weeks** post-procedure. During follow-up visits, symptom relief, recurrence, complications (such as pain, bleeding, infection, or urinary retention), and patient satisfaction were assessed using a structured questionnaire.

Outcome Measures

- **Primary Outcome:** Symptomatic relief and resolution of hemorrhoids at 12 weeks
- **Secondary Outcomes:** Incidence of post-procedure complications, recurrence rates, and patient satisfaction

Data Collection and Statistical Analysis

Data was collected using a pre-designed, structured proforma. The variables recorded included demographic data, presenting symptoms, number of hemorrhoidal columns ligated, and outcomes. Data were entered into Microsoft Excel and analyzed using SPSS version 25. Descriptive statistics such as mean, standard deviation, and percentages were used. Chi-square test and paired t-test were applied to evaluate associations, and p-value < 0.05 was considered statistically significant.

OBSERVATION AND RESULTS

Table 1: Distribution of demographic variable among study population

Parameter	Frequency	Percentage
Age		
21–30 Years	12	15.4
31–40 Years	20	25.6
41–50 Years	22	28.2
51–60 Years	16	20.5
>60 Years	8	10.3
Gender		
Male	54	69.2
Female	24	30.8
SES (Modified B.G. Prasad)		

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Upper	5	6.4
Upper Middle	16	20.5
Middle	34	43.6
Lower Middle	18	23.1
Lower	5	6.4
Food Habits		
Vegetarian	30	38.5
Non-Vegetarian	48	61.5
Parameter	Frequency	Percentage
Presenting Symptoms		
Bleeding per rectum	62	79.5
Prolapse	51	65.4
Pruritus	34	43.6
Pain	21	26.9
Soiling	18	23.1
Grade of Haemorrhoids		
Second Degree	46	59
Third Degree	32	41

This table presents the demographic profile of the study participants. The age distribution shows that the majority of patients were in the 41–50 years age group (28.2%), followed by 31–40 years (25.6%) and 51–60 years (20.5%), indicating that middle-aged individuals were more commonly affected. Males constituted a significant proportion of the study population (69.2%), suggesting a higher prevalence or healthcare-seeking behavior among men for hemorrhoidal conditions. Regarding socioeconomic status (SES), the majority belonged to the middle (43.6%) and lower middle (23.1%) classes as per the modified B.G. Prasad classification, reflecting a greater burden among these economic strata. Additionally, 61.5% of patients were non-vegetarian, hinting at a possible dietary correlation, as low-fiber, meat-heavy diets may contribute to constipation and hemorrhoidal development. Among presenting symptoms, bleeding per rectum was the most common (79.5%), followed by prolapse (65.4%), pruritus (43.6%), pain (26.9%), and soiling (23.1%). With respect to clinical grading, 59% of patients had second-degree hemorrhoids while 41% had third-degree hemorrhoids, indicating a predominance of moderately advanced disease in the study population.

Table 2: Mean distribution of hospital stay between second and third degree Haemorrhoids.

Duration of Hospital Stay	Second Degree	Third Degree	t-test	P-value
Mean	1.23	1.89	5.6	<0.001
SD	0.42	0.62		

This table compares the duration of hospital stay for patients with second- and third-degree hemorrhoids. Patients with second-degree hemorrhoids had a significantly shorter mean hospital stay (1.23 ± 0.42 days) compared to those with third-degree hemorrhoids (1.89 ± 0.62 days). The t-test value of 5.6 and a highly significant p-value of <0.001 highlight that this difference is statistically significant. This finding suggests that band ligation in third-degree hemorrhoids may require longer observation or a more cautious post-procedure approach due to a possibly greater extent of tissue involvement or symptom severity.

Table 3: Median distribution of patients satisfaction between second and third degree Haemorrhoids.

Patients Satisfaction Score	Second Degree	Third Degree	p-value
Median	7	5	<0.001
IQR	2	1	

This table outlines patient satisfaction post-banding, comparing second- and third-degree hemorrhoids. The median satisfaction score was 7 in second-degree and 5 in third-degree hemorrhoids, with respective interquartile ranges (IQRs) of 2 and 1. A statistically significant p-value of <0.001 indicates that patients with second-degree hemorrhoids reported higher satisfaction despite having more advanced disease.

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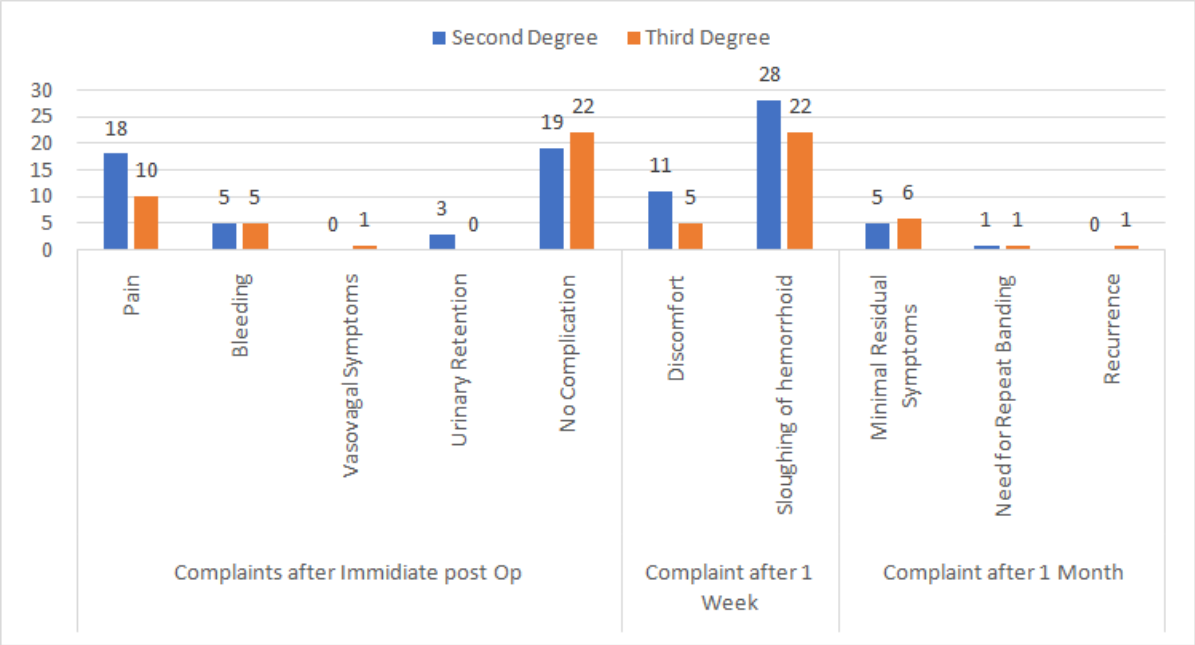

Figure 1: Distribution of complaints immediate after post op, after 1 week and 1 month between second and third degree Haemorrhoids.

Above figure outlines post-operative complaints following rubber band ligation in second- and third-degree hemorrhoids. Immediately after the procedure, pain was more common in second-degree cases (18 vs. 10), while both groups had equal bleeding (5 cases each). Urinary retention occurred only in second-degree patients, and vasovagal symptoms were rare.

At one week, sloughing of hemorrhoids was the most common finding (28 in second-degree, 22 in third-degree), with mild discomfort reported in both groups. After one month, most patients had minimal residual symptoms, only one patient in each group needed repeat banding, and recurrence was seen in just one third-degree case. Overall, the procedure showed good safety and effectiveness in both groups.

DISCUSSION

The present study evaluates the efficacy and safety of rubber band ligation (RBL) in managing second- and third-degree hemorrhoids, focusing on clinical outcomes, patient satisfaction, and complications. The findings reaffirm the role of RBL as an effective, minimally invasive treatment with favorable patient outcomes.

In our study, the majority of patients were in the 41–50 years age group, with a male predominance (69.2%), aligning with observations by Gupta PJ, who noted a similar demographic pattern in his prospective evaluation of hemorrhoidal disease in an Indian cohort [8]. The high proportion of middle and lower-middle socioeconomic status (66.7%) and non-vegetarian dietary habits (61.5%) supports existing literature that associates dietary and lifestyle factors with hemorrhoidal development [9].

Bleeding per rectum (79.5%) and prolapse (65.4%) were the most common presenting symptoms, consistent with clinical presentations reported by Jain BK et al. in their comparative study of hemorrhoid management techniques [10]. The prevalence of second-degree hemorrhoids (59%) in our study suggests a timely presentation of patients before progression to advanced grades.

The mean hospital stay was significantly lower in second-degree hemorrhoids (1.23 days) compared to third-degree (1.89 days, $p< 0.001$), indicating quicker recovery and less intensive postoperative care. This finding is consistent with the study by Gajbhiye et al., who found shorter hospital stays with RBL in less advanced hemorrhoidal grades [11].

Patient satisfaction was notably higher in second-degree hemorrhoid patients (median score 7 vs. 5 in third-degree, $p< 0.001$). While third-degree patients also showed improvement, their lower satisfaction could reflect more extensive disease or slower resolution. These results echo the findings of Chawla et al., who reported greater satisfaction in early-grade hemorrhoids treated with RBL [12].

Postoperative complications were mild and self-limiting. Pain was more common in second-degree cases, while bleeding incidence was similar across both groups. Sloughing was frequent at one week post-procedure, which is an expected consequence of ischemic necrosis induced by banding. Only one recurrence was noted in a third-degree case, demonstrating a low failure rate. Similar low complication and recurrence rates have been reported by Gajendra et al. in their evaluation of RBL efficacy in Indian patients [13].

Overall, the study supports RBL as a safe, outpatient-based treatment modality with high success and satisfaction rates, especially for second-degree hemorrhoids. Though third-degree cases may require

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longer recovery, RBL still provides a viable alternative to conventional surgery with minimal morbidity.

CONCLUSION

Rubber band ligation proved to be an effective and safe modality for the management of second and third-degree hemorrhoids. Patients with second-degree hemorrhoids demonstrated significantly shorter hospital stays and higher satisfaction scores compared to those with third-degree hemorrhoids. Postoperative complications were generally mild and self-limiting, with a low recurrence rate in both groups. These findings support the use of band ligation as a reliable, minimally invasive treatment, particularly beneficial in second-degree cases.

Acknowledgement: None
Conflict of Interest: None

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