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ORIGINAL ARTICLE

A Comparative Study Between Open Hemorrhoidectomy and Rubber Band Ligation for Second Degree Hemorrhoids: A Prospective Randomized Control Study

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Abstract

Background: The symptoms of hemorrhoids has a wide spectrum that ranges from bleeding per rectum, itching, prolapse of the hemorrhoidal cushions, thrombosis leading to pain and discomfort, incontinence especially of fluids and mucous discharge. But for surgical management, hemorrhoidectomy is more sustainable in symptom control and has been considered as gold standard. Rubber band ligation has been the most popular amongst non-surgical interventions because of its effectiveness, minimal complication rate and shorter recover period compared to operative procedures. The present study aimed at determining the efficacy and safety of rubber banding ligation procedure versus the standard hemorrhoidectomy for second degree hemorrhoids. **Methods:** A prospective randomised comparative study was conducted at Department of Surgery, Indira Gandhi Medical College Hospital, Puducherry for 18 months after getting institutional ethical committee clearance. A total no. of 74 cases of 2nd degree hemorrhoids were divided into two groups A (open hemorrhoidectomy) and B (banding) by simple randomization technique of 37 each. A detailed history & examination including per rectal and Proctoscopy examination was done of each patient and the data entered in the pro forma. The description of data was expressed in the form of mean±SD for quantitative data, while frequency and proportion for qualitative data. **Results:** Totally male patients represented 57% compared to female with 43% 78% of the patients who underwent banding did not have any immediate post-operative complications while only 4 persons reported pain and bleeding post-operatively compared to 12 patients reporting bleeding and 11 patients reporting pain after hemorrhoidectomy. The duration of hospital stay post procedures was found to be lesser in banding group compared to hemorrhoidectomy group with p value being statistically highly significant ($p<0.001$). **Conclusion:** Rubber band ligation is very simple, safe, effective outpatient procedure that can be performed for grade II hemorrhoids. It generally requires fewer expertise and instruments. It is found to improve the symptoms of the patients and making them sustain a good quality of life since it has minimal complications.

Keywords: Hemorrhoids, Rubber band ligation, Open Haemorrhoidectomy

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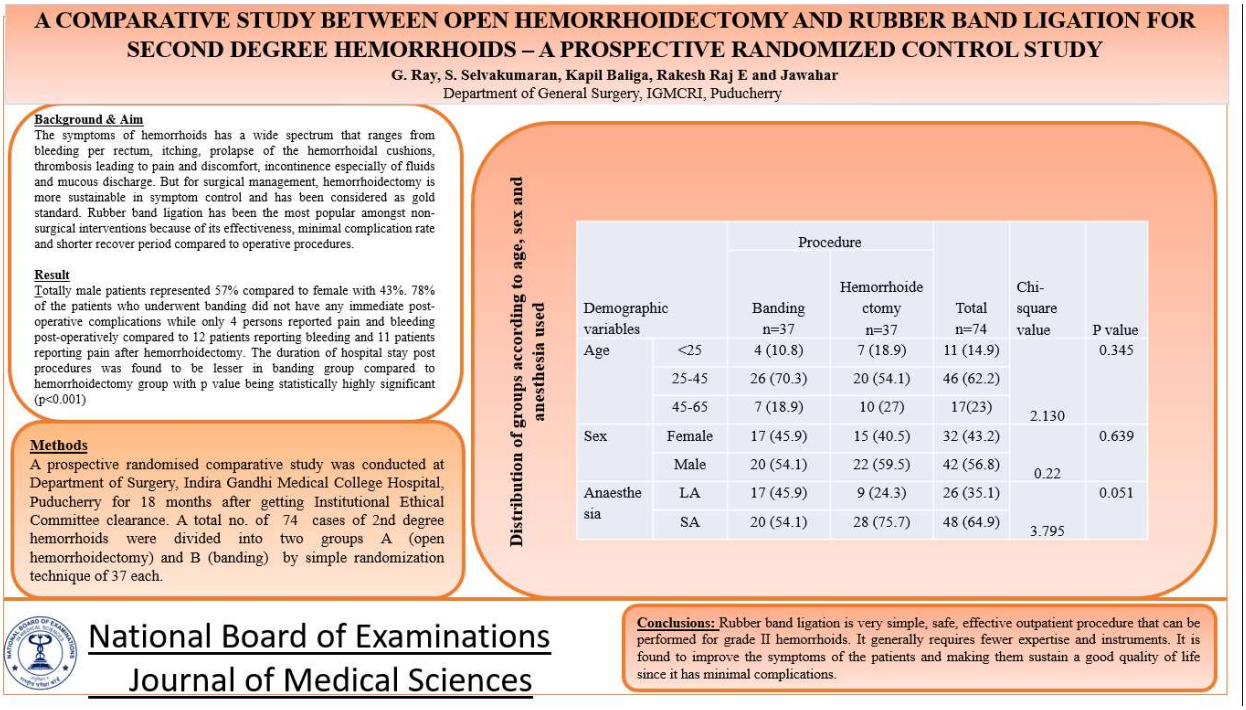
Graphical Abstract



Introduction

Among the commonest and frequently occurring pathology in the anal region is the hemorrhoids, which is commonly encountered at clinical practice. Globally 5% of the general population have been suffering from symptoms of hemorrhoids [1]. It has been found affecting both sexes equally and occurs at any age [2,3]. The pathological changes in the anal cushion which is the normal component of the anal canal and the enlargement of the hemorrhoidal plexus results in the development of hemorrhoids. The word hemorrhoids has its origin from the Greek word Hemarhos (Hema=blood, rhos=flow) [4].

The symptoms of hemorrhoids has a wide spectrum that ranges from bleeding per rectum, itching, prolapse of the hemorrhoidal cushions, thrombosis leading to pain and discomfort, incontinence especially of fluids and mucous discharge. Internal hemorrhoids are generally classified into four degrees based on their extent of prolapse among which the fourth degree hemorrhoids are permanently prolapsed. The severity of symptoms may not be associated with the degree of hemorrhoids. Various techniques and options for conservative medical management and also for non-surgical treatments are on the practice in treating symptomatic hemorrhoids which includes life style advice, diet, toilet behavior, rubber banding ligation, sclerotherapy, cryotherapy, photocoagulation, laser etc. But for surgical management, hemorrhoidectomy is more sustainable in symptom control and has been considered as gold standard (5) for symptomatic conditions but they incur

postoperative pain, long hospital stay and recovery and significant level of complications [6,7].

Rubber band ligation has been the most popular amongst non-surgical interventions because of its effectiveness, minimal complication rate and shorter recover period compared to operative procedures [5,8,9]. But considering its simplicity, this known for its rare adverse events like pelvic sepsis and Fournier's gangrene and also its diminishing long term efficacy [10]. We conducted this comparative randomized study to determine the efficacy and safety of rubber banding ligation procedure versus the standard hemorrhoidectomy for second degree hemorrhoids.

Material and Methodology

A prospective randomized comparative study was conducted at Department of Surgery, Indira Gandhi Medical College Hospital, Puducherry for 18 months. The institutional ethics committee approval obtained No.375/IEC-33/IGMCRI/PP-09/2022

Inclusion criteria

- Age >20 year
- Patient and/or his/her legal representative has read and signed the approved Informed Consent Form before treatment
- Patients with second degree hemorrhoids

Exclusion criteria

- Patients with fistula in ano
- Patients with fissure in ano
- Active malignancy
- Patients with bleeding disorder
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All patients with second degree hemorrhoids admitted to Indira Gandhi Medical College Hospital were enrolled based on inclusion and exclusion criteria. A total no. of 74 cases of 2nd degree hemorrhoids were divided into two groups A (open hemorrhoids) and B (banding) by simple randomization technique of 37 each. A detailed history & examination including per rectal and Proctoscopy examination was done of each patient and the data entered in the pro forma. The patients were explained in detail about their disease and the modalities of treatment as Rubber band ligation, open hemorrhoidectomy with the advantages and disadvantages of each. Willing patients were selected and examined and investigated as per pro forma.

Presenting complaints were noted, duration of the surgery was calculated in minutes. The Group A patients (open hemorrhoidectomy) were done under spinal anesthesia and Group B patients (Banding) were operated under local anesthesia. Post-operative pain & requirement of analgesia was calculated in days. Post- operative stay was also calculated in days. Postoperative complications & cost of treatments were also compared.

Statistical analysis of the data was done using SPSS (Statistical Package for Social Science) version 26. The description of data was expressed in the form of mean±SD for quantitative data, while frequency and proportion for qualitative data. The analysis was done to test the statistical significance between the two groups using t

test for quantitative data and chi-square test for qualitative data. P<0.05 was considered significant.

Results

In our study totally 74 patients participated, 37 patients in each group. Only 4 patients were under 25 years of age in banding group while 26 patients were between 25-45 years compared to 20 patients in hemorrhoidectomy group. Totally male patients represented 57% compared to female with 43% as shown in Table 1. The presenting complaints (bleeding per rectum for both groups) and the comorbidities of the two groups were also comparable.

Table 1. Distribution of groups according to age, sex and anesthesia used

Demographic variables		Procedure		Total n=74	Chi-square value	P value
		Banding n=37	Hemorrhoidectomy n=37			
Age	<25	4 (10.8)	7 (18.9)	11 (14.9)		0.345
	25-45	26 (70.3)	20 (54.1)	46 (62.2)		
	45-65	7 (18.9)	10 (27)	17(23)	2.130	
Sex	Female	17 (45.9)	15 (40.5)	32 (43.2)		0.639
	Male	20 (54.1)	22 (59.5)	42 (56.8)	0.22	
Anaesthesia	LA	17 (45.9)	9 (24.3)	26 (35.1)		0.051
	SA	20 (54.1)	28 (75.7)	48 (64.9)	3.795	

78% of the patients who underwent banding did not have any immediate post-operative complications while only 4 persons reported pain and bleeding post-operatively compared to 12 patients reporting bleeding and 11 patients reporting pain after hemorrhoidectomy. The p value (p<0.002) was found to significant post operatively among the groups. On follow up visits on 1st and 3rd week patients underwent banding did not report any complications like pain or bleeding compared to hemorroidectomy group with p value between groups at 1st and 3rd week was found to be statistically significant (p<0.5) as in Table 2.

Table 2. Distribution of groups according to post-operative complications and follow up

Follow-up outcome		Procedure		Total n=74	Chi-square value	P value
		Banding n=37	Hemorrhoidectomy n=37			
Post op complication	No	29 (78.4)	14 (37.8)	43 (58.1)	12.499	0.002*
	Bleeding	4 (10.8)	12 (32.4)	16 (21.6)		
	Pain	4 (10.8)	11 (29.7)	15 (20.3)		
1st week	Bleeding	0 (0)	6 (16.2)	6 (8.1)		<0.001*
	Mild pain	0 (0)	9 (24.3)	9 (12.2)		
	No pain	37 (100)	22 (59.5)	59 (79.7)	18.814	
3rd week	Bleeding	0 (0)	0 (0)	0 (0)	6.529	0.011*
	Mild pain	0 (0)	6 (16.2)	6 (8.1)		
	No pain	37 (100)	31 (83.8)	68 (91.9)		

The duration of hospital stay post procedures was found to be lesser in banding group compared to hemorrhoidectomy group with p value being statistically highly significant (p<0.001) as denoted in Table 3 and the level of pain felt by the patients post operatively for first three consecutive days was significantly lesser in banding group compared to hemorrhoidectomy group with p value again being statistically highly significant (p<0.001) as denoted in Table 4.

Table 3. Distribution of groups according to period of stay

Period of stay (days)	Procedure		Total n=74	Chi-square value	P value
	Banding n=37	Hemorrhoidectomy n=37			
<2	26 (70.3)	7 (18.9)	33 (44.6)		
2-4	11 (29.7)	20 (54.1)	31 (41.9)		
4-6	0 (0)	10 (27)	10 (13.5)	23.552	<0.001*

Table 4. Distribution of groups according to pain score

Pain score	Procedure	Mean	Std. Deviation	T value	P value
Day 1	Banding	2.68	1.473	-10.311	
	Hemorrhoidectomy	5.95	1.246		<0.001*
Day 2	Banding	0.59	0.896	-13.014	
	Hemorrhoidectomy	3.65	1.111		<0.001*
Day 3	Banding	0	0	-15.067	
	Hemorrhoidectomy	1.59	0.644		<0.001*

Discussion

Considering the modalities for management of hemorrhoids, there is no single best treatment since there are wide range of options available depending on the symptom and grading of hemorrhoids. Safety of the patient and the modality of treatment used in treating non-life threatening hemorrhoids is of prime importance. Many clinical studies have employed rubber band ligation procedure in comparison with other treatment modalities or as standalone procedure [11]. When it comes to the success rate of rubber band ligation technique, various studies have shown an average rate of about 75% and the highest being 92% [12,13]. In our study the overall success rate was around 78% (29/37 patients in banding group).

Lu et al. [14] in their study reported after two months follow up that among second degree patients, 92% did not show any residual symptoms while it was 76% among third degree patients. Compared to the present study, after third week follow up, there was no residual symptoms among banding group while 16% of patients among open hemorroidectomy group had residual symptoms. In a systematic review involving 39 studies indulging 8060 patients where banding procedure was done, 5.8% suffered from severe pain, 1.7% suffered from hemorrhage and 0.05% suffered from infection [15] while Lu et al. [14] observed that mild to moderate pain was appreciated by only 41% of patients after 24 to 48 hours initial treatment which is quite high compared to the present study where only 20% experienced pain post operatively in both the groups. Our study results was same as Vinayak et al study which again showed pain among 20% of their study subjects deploying ligation procedure [16].

Bleeding post ligation procedure was primarily due to falling off of the hemorrhoids and local inflammation of tissues. In Vinayak et al (16) study only 10% reported bleeding while study conducted by Lu et al. [14] and El Nakeeb et al. [13] study reported 2% and 4% of bleeding post banding procedure. In the present study among banding group only 4 out of 37 patients (10%) reported bleeding post operatively while there were zero reporting of any bleeding after first and third week review of the patients. When compared to the number

of hospitalization and early return to duty few studies are in par with our study where around 85% of patients returned back to duty around a week's stay at hospital among which nearly half of the patients (44%) had stayed less than three days in hospital post treatment [17,18].

Conclusion

Rubber band ligation is very simple, safe, effective outpatient procedure that can be performed for grade II hemorrhoids. It generally requires fewer expertise and instruments. It is found to improve the symptoms of the patients and making them sustain a good quality of life since it has minimal complications while preserving the anorectal anatomy and the anal sphincter. Comparatively it is found to have good outcome and cost effective when considered with other treatment modalities. It has got lesser prevalence of recurrence and good success rate after the first session itself.

Ethical Approval

The institutional ethics committee approval obtained No.375/IEC-33/IGMCRI/PP-09/2022

Conflicts of interest

The authors declares that they do not have conflict of interest.

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