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ORIGINAL ARTICLE

Outcome of Rubber Band Ligation in Treatment of Hemorrhoids — Study of 50 Cases

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ABSTRACT

Background: *Haemorrhoids are a common anorectal condition that can significantly affect patients' quality of life. Rubber band ligation (RBL) is widely regarded as a safe and effective outpatient procedure for the treatment of second-degree and selected third-degree haemorrhoids.* ***Objective:*** *To evaluate the clinical outcomes, efficacy, and safety of rubber band ligation in a cohort of 50 patients with symptomatic haemorrhoids.* ***Methods & Materials:*** *A prospective study was conducted from July 2007 to March 2008 at the Department of Surgery, Chittagong Medical College Hospital, Bangladesh. The study followed up on the 7th day, 6th week, and 6th month post-procedure of 50 patients diagnosed with haemorrhoids who underwent RBL. We documented demographic data, clinical presentations, procedural outcomes, complications, and the need for further intervention.* ***Results:*** *Among the 50 patients treated, 68% were male, and the majority were aged between 40 years. Per rectal bleeding was the most common symptom (100%), with prolapse during defaecation reported in 86% of cases. 58% of patients showed mild anaemia. RBL resulted in symptom resolution in 88% of patients. Complications were predominantly mild and included haemorrhage (31.57%), pain (21.04%), oedema (18.42%), and band dislodgement (5.26%), all managed conservatively. Recurrence of haemorrhoids was observed in 6% of cases.* ***Conclusions:*** *Rubber band ligation is a safe, effective, and well-tolerated outpatient procedure for the management of second-degree and selected third-degree haemorrhoids. It achieves a high success rate with minimal complications and obviates the need for hospital admission or anaesthesia, making it particularly suitable in resource-limited settings. Further studies with larger, randomised cohorts are recommended to validate these findings and refine patient selection.*

Keywords: *Haemorrhoids; Rubber band ligation; Anaemia*

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INTRODUCTION

Haemorrhoids are enlarged vascular cushions within the anal canal. Anatomically, every individual possesses anal cushions, comprising blood vessels, smooth muscle (Treitz's muscle), and elastic connective tissue embedded within the submucosa. These structures are situated in the upper anal canal, extending from the dentate line to the anorectal ring (puborectalis muscle)[1,2]. The pathogenesis of haemorrhoids involves the downward displacement of these anal cushions due to the disruption of their anchoring mechanisms and the flattening action of Treitz's muscle and its interwoven elastic fibres[3]. A more detailed understanding of the anatomy and pathophysiology of haemorrhoids has led to the development of various therapeutic modalities for their management[4]. Initial conservative management is recommended for all but the most advanced cases. This approach includes dietary modification, such as the elimination of constipating foods (e.g. cheese), the incorporation of bulking agents and stool softeners, and an increase in fluid intake. Additionally, lifestyle adjustments, particularly the inclusion of regular exercise, are often advocated. The choice of treatment is primarily guided by the degree of haemorrhoidal disease[5]. First- and second-degree haemorrhoids generally respond well to conservative medical management[6]. Non-surgical therapeutic options include sclerotherapy, Barron's rubber band ligation, cryosurgery, the Lord's procedure, laser

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haemorrhoidectomy, and infrared photocoagulation[6]. For haemorrhoids that do not respond adequately to medical therapy, interventions such as rubber band ligation, injection sclerotherapy, cryosurgery, photocoagulation, or excisional haemorrhoidectomy may be considered[6]. Among surgical treatments for intractable or prolapsed haemorrhoids, formal haemorrhoidectomy has traditionally been the standard approach. However, stapled haemorrhoidopexy now represents a viable alternative in selected cases[4]. In recent decades, there has been a growing interest in minimally invasive procedures for the treatment of haemorrhoids, driven by the limitations associated with classical haemorrhoidectomy, which often necessitates hospitalisation, involves significant postoperative discomfort, and results in prolonged periods of convalescence[8]. In 1954, Blaisdell introduced an instrument for the outpatient ligation of internal haemorrhoids. This technique was further refined by Barron in 1962, who reported excellent outcomes in two published series[9]. Rubber band ligation is indicated for patients presenting with symptoms of bleeding, prolapse, or both. The procedure does not require anaesthesia and involves the placement of the rubber band on an insensitive area, usually at or just above the dentate line. Multiple sessions at intervals of 3–4 weeks may be necessary to address all symptomatic haemorrhoidal sites[9]. In developing countries, a significant proportion of the population remains uneducated and frequently seeks advice from unlicensed practitioners, who may use harmful methods such as the application of corrosive agents. The fear of surgery often compels patients to consult traditional healers, many of whom claim to be 'piles specialists'. Establishing simple outpatient procedures like rubber band ligation, which does not require anaesthesia, may therefore encourage patients to seek appropriate medical treatment rather than subjecting themselves to potentially hazardous alternative therapies. Given the fluctuating intensity of haemorrhoidal symptoms and the availability of multiple treatment modalities of variable efficacy, the benefit of Barron's rubber band ligation remains widely accepted[10]. This small-scale study aims to evaluate the outcome of rubber band ligation for the treatment of haemorrhoids in a cohort of 50 patients. It also seeks to determine the need for subsequent interventions following initial management. Rubber band ligation offers the added advantage of obviating the need for hospital admission or anaesthesia, rendering it a particularly suitable modality for the management of second-degree haemorrhoids[11].

Objective: To evaluate the clinical outcomes of rubber band ligation in the treatment of haemorrhoids in a cohort of 50 patients, focusing on its efficacy, safety, and acceptability as an outpatient-based procedure.

MATERIALS & METHODS

Place of Study: This study was conducted in the Department of Surgery at Chittagong Medical College Hospital, Bangladesh.

Period of Study: The study period extended from July 2007 to March 2008.

Study Population: The study population comprised 50 patients diagnosed with haemorrhoids who presented to the hospital during the study period. Eligible cases were selected from both outpatient and inpatient departments, provided they were deemed suitable candidates for rubber band ligation.

Sample Size and Sampling Technique: A total of 50 consecutive patients were enrolled using non-randomised purposive sampling.

Patient Selection: Patients with symptomatic haemorrhoids attending the outpatient department of the Surgery Department at Chittagong Medical College Hospital were evaluated between July 2007 and March 2008. Those considered appropriate for rubber band ligation were selected for the study. Additionally, five patients were recruited from the inpatient department who were admitted for symptomatic haemorrhoids management. Four patients with haemorrhoids and severe anaemia were included, necessitating hospital admission for blood transfusion. In total, nine patients were treated as inpatients, while the remaining 41 patients were managed on an outpatient basis, typically being discharged within two to four hours post-procedure. Follow-up visits were scheduled at the 7th day, 6th week, and 6th month.

All patients underwent thorough clinical examination and standard preoperative investigations prior to the procedure.

Exclusion Criteria

Patients with the following conditions were excluded from the study:

1. Thrombosed or prolapsed haemorrhoids
2. External haemorrhoids
3. Associated skin tags or rectal prolapse
4. Haemorrhoids accompanied by anal fissures
5. Immunocompromised patients

Technique of Rubber Band Ligation

Patients were instructed to take syrup lactulose nightly from the day of their initial outpatient visit until the day of the procedure. On the day of the procedure, patients were positioned appropriately, and a small cleansing enema was administered in select cases as necessary. Local anaesthetic jelly was applied prior to proctoscopic examination.

Rubber band ligation was performed using a suction-type ligator, preloaded with two rubber bands. The most prominent haemorrhoidal pile was addressed first. Negative suction pressure was applied to draw the haemorrhoid into the ligator drum. If the patient reported pain, the ligator was repositioned slightly more proximally. Once the haemorrhoidal tissue was adequately drawn into the drum, the trigger was released, deploying two rubber bands to ensure complete ligation and to mitigate the risk of band breakage. A maximum of two haemorrhoidal piles were ligated per session; remaining haemorrhoids were treated at subsequent sessions spaced six weeks apart. Following ligation, the proctoscope was carefully withdrawn.

Post-procedural care included maintaining bowel actions without straining, dietary advice, and stool softeners for up to two weeks. Patients were cautioned regarding the possibility of initial bleeding and the potential for bleeding upon band sloughing.

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Follow-up Protocol

- **First Follow-up (7th day):**
  - Patients were assessed regarding the need for analgesics post-procedure, and the duration of use if applicable.
  - Enquiries were made about per rectal bleeding, noting frequency and association with defaecation.
  - Patients were asked about other symptoms or complications.
  - A local inspection of the anal region was performed; no digital rectal examination or proctoscopy was undertaken at this stage.
  - Iron and folic acid supplementation were provided to anaemic patients; laxatives were continued for two weeks.
- **Second Follow-up (6th week):**
  - Patients were asked about persistent symptoms, including pain and bleeding.
  - Clinical examination was performed; proctoscopy was carried out in patients with residual symptoms or where additional haemorrhoidal piles were noted.
  - Re-banding was performed in two cases where band slippage was identified.
- **Third Follow-up (6th month):**
  - Patients were assessed for any ongoing complaints.
  - A full clinical examination was conducted, including proctoscopy in all cases.
  - Patients with unresolved symptoms were offered further appropriate treatment.

All data were meticulously recorded in individual patient files, including details from follow-up assessments.

Potential Complications: Complications monitored included delayed haemorrhage, severe pain, thrombosis of haemorrhoids, ulceration, slippage of the ligature, and fulminant sepsis. Patients were carefully observed for any of these events during the follow-up period.

RESULTS

The present study assessed the outcomes of rubber band ligation for the treatment of haemorrhoids in a cohort of 50 patients over a period from July 2007 to March 2008 at Chittagong Medical College Hospital, Bangladesh. Data were collected regarding patient demographics, presenting symptoms, procedural outcomes, complications, and the need for further intervention during follow-up. The findings are presented below, highlighting the effectiveness of rubber band ligation in symptom resolution and patient satisfaction, as well as documenting any complications encountered during the follow-up period.

Table – I: Demographic characteristics of patients undergoing rubber band ligation for haemorrhoids

Variables		N(%)
Gender		
	Male	34(68%)
	Female	16 (32%)
Age group		
	< 30 years	14 (28%)
	31-40years	21 (42%)
	41-S0years	9 (18%)
	51-60years	4 (8%)
	> 60 years	2(4%)
Occupation		
	Business	17 (34%)
	Service	13 (26%)
	House wife	9 (18%)
	Cultivators	4 (8%)
	Student	7 (14%)

Table 1 presents the demographic characteristics of the 50 patients who underwent rubber band ligation for haemorrhoids at Chittagong Medical College Hospital. It shows a predominance of male patients (68%), with the majority falling within the 31–40 years age group (42%). The occupational distribution indicates that business persons constituted the largest group (34%), followed by service holders (26%). This distribution highlights the socio-demographic profile of the study population, which may influence both presentation and treatment-seeking behaviour.

Table – II: Clinical presentation of patients treated with rubber band ligation

Clinical Presentation	N (%)
Per rectal bleeding	50 (100%)
Discharge	8 (16%)
Prolapse during defecation	43 (86%)
Anaemia	
Mild	29 (58%)
Moderate	6 (12%)
Severe	2 (4%)
Duration	
< 1 month	9 (18%)
2-6 months	21 (42%)
6 months – 12 months	13 (26%)
12 months+	7 (14%)

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Table 2 outlines the clinical presentation of patients at the time of enrolment in the study. All patients (100%) presented with per rectal bleeding, while 86% reported prolapse during defaecation. Anaemia was observed in varying degrees, with mild anaemia being the most prevalent (58%). The duration of symptoms varied considerably, with the majority of patients (42%) reporting symptoms lasting between two to six months. This table underscores the symptomatic burden associated with haemorrhoidal disease and the potential impact on patients' quality of life.

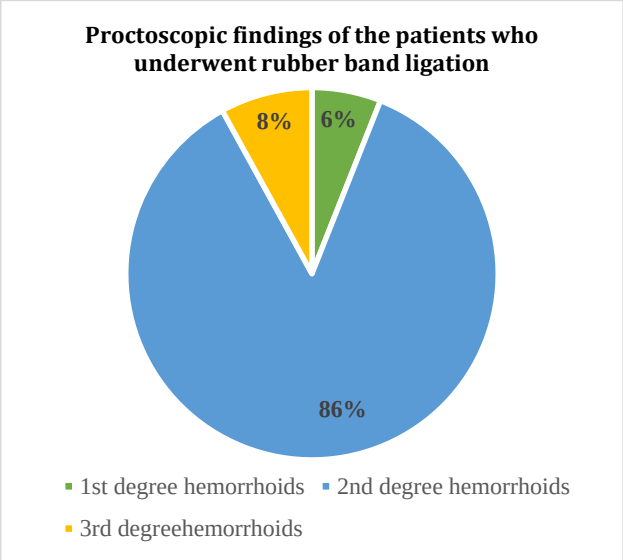

Figure – 1: Pie chart showing the distribution of proctoscopic findings among patients who underwent rubber band ligation

Figure 1 depicts the distribution of proctoscopic findings among the patients who underwent rubber band ligation. The figure illustrates the relative proportions of internal haemorrhoids at different grades and highlights the most common proctoscopic features identified during the procedure. This visual representation enhances the reader's understanding of the disease severity and its correlation with the clinical indications for rubber band ligation.

Table – III: Outcome measures and treatment course for patients undergoing rubber band ligation, including subsequent treatment requirements and session distribution

Variables	N(%)
Causes of requiring surgery	
3rd degree hemorrhoid	2 (66.66%)
Failure of application of band	1 (33.33%)
Number of session need to complete treatment	
One	20 (40%)
Two	23 (46%)
Three	4 (8%)
Other treatment needed	3 (6%)
Outcome of treatment with rubber band ligation	
No bleeding/discharge	34 (68%)
Bleeding during defecation< 7days	8 (16%)
Bleeding during defecation> 7days	4 (8%)
Recurrence of hemorrhoids	1 (2%)
No change (needed further surgery)	3 (6%)
Duration of post-operative analgesic requirement	
NSAID	
Up to 24 hours	7 (36.80%)
24-48 hours	9 (47.37%)
> 48 hours	3 (15.79%)

Table 3 summarises the key outcomes following rubber band ligation. Notably, 68% of patients experienced complete resolution of bleeding and discharge post-procedure. However, 16% reported bleeding during defaecation within

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seven days, while a further 8% reported bleeding persisting beyond seven days. A single patient (2%) experienced recurrence of haemorrhoids, and 6% required further surgical intervention. The table also documents the number of sessions required to complete treatment, with the majority (46%) requiring two sessions. These findings collectively illustrate the efficacy of rubber band ligation and provide insight into the procedural burden for patients.

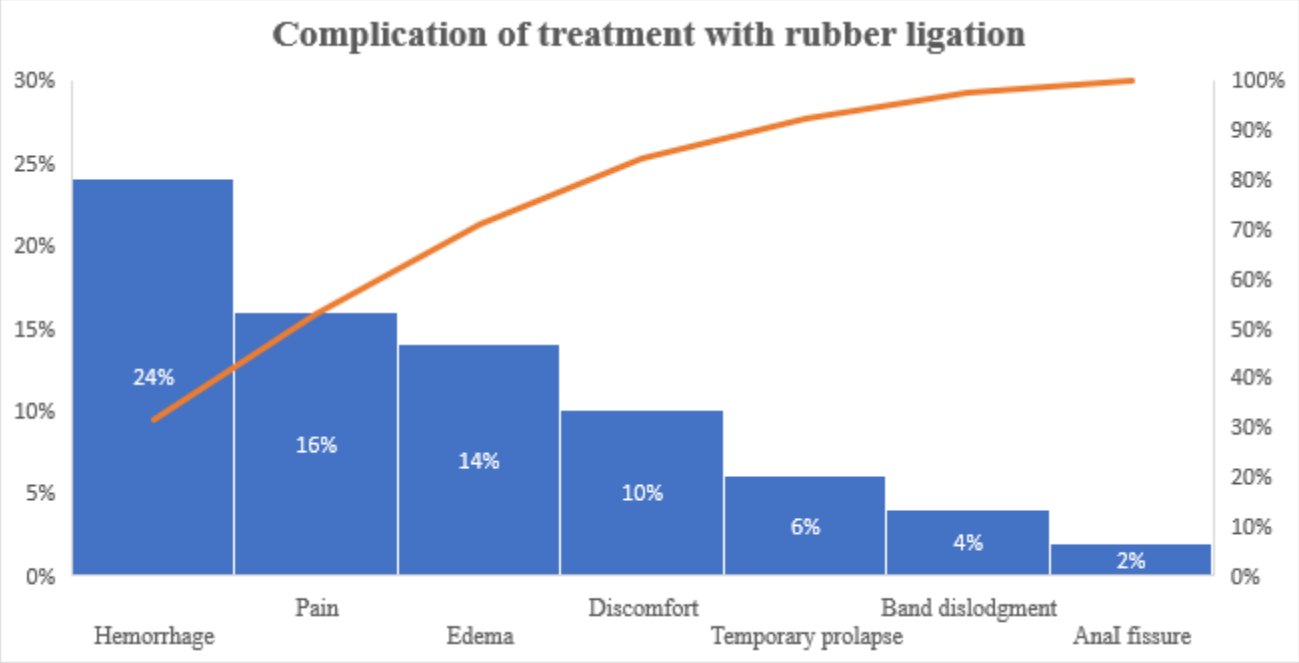

Figure – 2: Complications following rubber band ligation for haemorrhoids

Figure 2 illustrates the complication profile associated with rubber band ligation. The figure graphically demonstrates the frequency of each complication, facilitating an at-a-glance comparison of their relative incidences. It complements the data presented in Table 4, reinforcing the finding that complications were generally mild and manageable with conservative measures.

Table – IV: Complications associated with rubber band ligation and their management

Complication		Management	Percentage (%)
Discomfort		Reassurance	5 (13.15%)
Pain	Mild	NSAID- Ibuprofen	6 (15.78%)
	Moderate	NSAID- Ibuprofen 3-5 days	2 (5.26%
	Severe	None	0 (0%)
Hemorrhage	Mild	Reassurance	12 (31.57%)
	Moderate	-	0 (0%)
	Severe	-	0 (0%)
Edema		Reassurance	7 (18.42%)
Temporary prolapse		NSAID+ antibiotic for 7 days	3 (7.89%)
Band dislodgement		Re-banding	2 (5.26%)
Anal fissure		Application of 0.2% GTN	1 (2.63%)

Table 4 details the complications observed following rubber band ligation and their respective management approaches. The most frequently reported complication was mild haemorrhage (31.57%), which was managed conservatively with reassurance. Pain was the second most common complication, affecting 21.04% of patients, with NSAIDs providing adequate symptomatic relief in most cases. Edema occurred in 18.42% of cases, while band dislodgement and anal fissure were infrequently observed. The table demonstrates that most complications were mild and manageable, with no reports of severe pain, moderate to severe haemorrhage, or fulminant sepsis. This underscores the safety and tolerability of the procedure in this cohort.

DISCUSSIONS

Rubber band ligation (RBL) has emerged as a popular, minimally invasive treatment modality for internal haemorrhoids, offering a safe and effective alternative to more

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invasive surgical interventions[11]. Despite its widespread use, the exact prevalence of haemorrhoidal disease remains difficult to ascertain, largely due to socio-cultural barriers and patients' reluctance to seek medical care. Nevertheless, epidemiological data estimate a prevalence ranging from 4.4% in adults in the United States to over 30% in general practice settings in the United Kingdom[1]. Such figures underscore the importance of effective outpatient-based therapies, particularly in resource-constrained settings.

Haemorrhoidal symptoms commonly manifest with recurrent bleeding, prolapse during defaecation, and the sensation of incomplete evacuation. Soiling is often associated with advanced disease, as a consequence of impaired continence or mucous discharge[4]. In the present study, all patients presented with per rectal bleeding, with 86% reporting prolapse during defaecation and 16% experiencing perianal discharge. These findings are consistent with the classical presentation of haemorrhoidal disease, highlighting the symptomatic burden faced by patients prior to seeking intervention.

Anaemia is a recognised complication of chronic haemorrhoidal bleeding, necessitating preoperative assessment and management. In this cohort, 74% of patients presented with varying degrees of anaemia, of whom 58% were mildly anaemic, 12% moderately anaemic, and 4% severely anaemic—often due to delayed presentation. These findings underscore the importance of early diagnosis and intervention to prevent progression to severe anaemia requiring hospitalisation.

The duration of symptoms prior to treatment varied significantly among the study population, with 18% presenting within one month, 42% within two to six months, 26% within six to twelve months, and 14% with symptoms persisting for over a year. This variation reflects the chronic and often relapsing nature of haemorrhoidal disease, as well as patient hesitation in seeking timely medical care.

Proctoscopic examination prior to RBL confirmed that most cases were second-degree haemorrhoids (86%), with fewer first-degree (6%) and third-degree (8%) cases, consistent with recommended selection criteria for this procedure. The careful exclusion of associated anorectal pathology ensured appropriate patient selection, thereby optimising the potential for successful outcomes.

The overall success rate of RBL in this study was high, with 88% of patients achieving complete symptom resolution and requiring no further intervention. Only 6% required additional medical therapy, including management of minor complications such as anal fissure and temporary prolapse, while 6% required subsequent surgical intervention. These results are consistent with those reported by Steinberg and Leugois, who documented an 89% success rate with only 2% of patients requiring surgery[12]. Similarly, studies by Gartell et al. demonstrated an 89% success rate in a cohort of 106 patients treated with RBL[13].

Complications observed in the present study were generally mild and manageable, echoing findings from previous studies. Mild pain and bleeding were the most frequently reported complications, managed conservatively with NSAIDs and reassurance. This is consistent with the work of V. Arabi et al., who reported pain and bleeding in 27% of cases following RBL[14]. In the current study, 16% of patients reported pain, while 24% experienced bleeding. Analgesic requirements were typically limited to 48 hours post-procedure, with only three patients requiring extended pain management.

Regarding procedural pain, the majority of patients (62%) experienced no pain, and analgesic use was confined to 38% of the cohort. This aligns with the results of Murie et al., who found the procedure painless in 10% of cases, while 30% required analgesics[15]. The findings of F.C. Cheng et al. similarly noted a high proportion of painless experiences in their study[16]. Bernal et al. reported analgesic use in 31% of patients[17], further corroborating the low morbidity profile of RBL.

The recurrence rate in this study was 6%, which is notably lower than rates reported by Konings et al. (40% recurrence after 6–18 weeks)[18] and Spallanzani et al. (8.8% recurrence)[19]. It is important to note that recurrence rates are influenced by follow-up duration and patient adherence to post-procedural recommendations. In the present study, follow-up compliance was high, with 100% attending the first follow-up, 86% the second, and 84% the third. Some patients who missed the second follow-up returned at the six-month mark, allowing for a comprehensive assessment of medium-term outcomes.

Overall, the outcomes from this study corroborate the robust efficacy and safety profile of RBL as reported in previous studies[15-19]. Although complications such as band dislodgement (5.26%) and temporary prolapse (6%) were noted, these were manageable and did not necessitate major interventions. The observed complication rates are in line with those reported by other investigators, highlighting the reproducibility and reliability of RBL across diverse clinical settings.

In conclusion, the present study reaffirms that rubber band ligation is a safe, effective, and well-tolerated outpatient procedure for the management of second-degree and selected third-degree haemorrhoids. Its high success rate, low complication profile, and minimal need for hospitalisation make it particularly advantageous in resource-limited settings where access to surgical care may be restricted. Future studies with larger sample sizes and longer follow-up periods are warranted to further elucidate long-term outcomes and comparative efficacy with other therapeutic modalities.

Conclusion

In conclusion, this study demonstrated that rubber band ligation is a safe, effective, and well-tolerated outpatient procedure for the management of second-degree and selected third-degree haemorrhoids. The procedure achieved a high rate of symptomatic relief, with the majority of patients experiencing resolution of bleeding and prolapse, and only a minority requiring further medical or surgical intervention. Complications were generally mild and manageable, supporting the role of rubber band ligation as a valuable therapeutic option, particularly in resource-limited settings where more invasive interventions may be less accessible.

Despite its limitations, this study contributes to the existing body of evidence, reinforcing the efficacy and safety profile of rubber band ligation, and underscores the need for future studies with larger, randomised cohorts to validate these findings and further refine patient selection criteria.

REFERENCES

1. *Schouten WR, Philip HG. Philip HG, Santhat N, Principles and practice of surgery_for the colon, rectum and anus. New York: lnforma Healthcare USA Inc; 2007.*
2. *Santhat N, Philip HG, Santhat N. Principles and practice of surgery for the colon, rectum and anus. New York: lnforma Healthcare USA Inc; 2007.*
3. *Thompson I. The nature of hemorrhoids. British jounal of surgery. 1975;62:542–52.*
4. *Pasha JN, John HS. Section of gatroinestinal surgery. British medical. 2003;327:847–51.*
5. *Mar A-F. Surgery of alimentary tract-common anorecta/ conditions. In: AI-Fallouji MAR. Post graduate surgery-the candidates guide. Oxford; 1998.*
6. *Mark LW, Anorectum Laurence WW, Gerard MD. Current surgical diagnosis and treatment. 2003;766–8.*
7. *Gerard MD. Special medkal problems in surgica patients. In: Laurence WV/1 G rard MD Current surgical diagnosis and treatment. McGraw Hill; 2003.*
8. *Collin BJ, Philip HS. Instrumental methods of treating hemorrhoids. Proc Roy Soc Med. 1974;67:174–6.*
9. *Marvin LC. Philadelphia: Lippincott. In: Marvin LC Colon and rectal surgery. 1996. p. 827–33.*
10. *Forster CF, Sussman HZ, Patzeh WR. Optimization of Barron ligature •treatment of 2nd and 3rd degree hemorrhoids by means of a therapeutic trial.•schweizerische Rundschaw for medizin. praxis. 1996;85(46):1476–81.*
11. *Moller CK. Rubber band ligation of hemorrhoids: analysis of 281 patients. Ann Chir Gynaecol. 1977;66(4):184–6.*
12. *David MS. Long term assessment of rubber band ligation in proctology clinic, Birmingham. Birmingham British journal of surgery. 62:144–6.*
13. *Gartell PC, Sheridan RJ, Mcginn FP. Successful outcome of rubber band ligation. British journal of Sl:frgery. 72(6):478–9.*
14. *Arabi Y, Gatehouse D, Alexander JW. Rubber band ligation or lateral subcutaneous sphincterotomy for treatment of hemorrhoids. British journal of surgery. 64(10):737–40.*
15. *Murie JA, Andrew ML. Comparison of rubber band ligation and hemorrhoidectomy for 2nd and 3rd degree hemorrhoids: a prospective clinical trial. British journal of surgery. 67(11):786–8.*
16. *Cheng FC, Shum DW, Ong GB. The treatment of 2nd degree hemorrhoids by injection, rubber band ligation, maxima_l anal dilatation and hemorrhoidectomy: a prospective clinical trial. Aust NZ J Surgery. 1981;51(5):458–62.*
17. *Greca F, Hares MM, Nevah E. A randomized controlled trial to compare rubber band ligation with phenol injection. British journal of surgery. 68(4):250–2.*
18. *Konings M, Debets JM, Beaten CG. Rubber band ligation of hemorrhoids. Ned Tijdschr Geneeskd. 1999;143(24):1265–8.*
19. *Long term outcome of rubber band ligation. minerva Chir. 1997;52(9):1047–51.*