

PILOT STUDY ON HEMORRHOIDAL ARTERY LIGATION (HAL) WITH SPIRAL LIGATION OF HAEMORRHOIDAL MASS IN SECOND- AND THIRD-DEGREE INTERNAL HAEMORRHOIDS: A PROSPECTIVE CLINICAL STUDY OF 15 PATIENTS

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ABSTRACT

Background: Haemorrhoidal disease is one of the most common anorectal disorders encountered in surgical practice. Conventional haemorrhoidectomy is effective but often associated with postoperative pain, bleeding, delayed recovery, and patient discomfort. Hemorrhoidal Artery Ligation (HAL) is a minimally invasive procedure that reduces arterial inflow to haemorrhoidal cushions. The present study evaluates a modified HAL technique combined with spiral ligation of the haemorrhoidal mass, aimed at achieving simultaneous dearterialization, plication, and mucopexy. **Aim:** To evaluate the efficacy and safety of Hemorrhoidal Artery Ligation with Spiral Ligation in Grade II and Grade III internal haemorrhoids. **Materials and Methods:** A prospective pilot study was conducted on 15 patients diagnosed with Grade II and Grade III internal haemorrhoids. All patients underwent HAL combined with spiral ligation of the haemorrhoidal mass. Patients were evaluated for bleeding, prolapse, postoperative pain, complications, recurrence, and patient satisfaction during a follow-up period of 3 months. **Results:** Out of 15 patients, 8 (53.33%) had Grade II and 7 (46.67%) had Grade III internal haemorrhoids. Significant reduction in bleeding and prolapse was observed in all patients. Complete symptomatic relief was achieved in 13 patients (86.67%), while 2 patients (13.33%) reported occasional mild discomfort. No major complications or recurrence were observed during follow-up. **Conclusion:** HAL with Spiral Ligation appears to be a safe, effective, minimally invasive, and sphincter-preserving technique for Grade II and Grade III internal haemorrhoids. The procedure demonstrated excellent symptomatic relief, minimal postoperative pain, and early recovery.

KEYWORDS: Internal Haemorrhoids, Hemorrhoidal Artery Ligation, HAL, Spiral Ligation, Mucopexy, Minimally Invasive Surgery.

INTRODUCTION

Haemorrhoids are vascular cushions situated within the anal canal that contribute to continence. Enlargement and distal displacement of these cushions result in symptomatic haemorrhoidal disease. The prevalence of haemorrhoids has increased due to sedentary lifestyle, constipation, prolonged straining, obesity, and dietary factors.

Conventional haemorrhoidectomy remains the standard treatment for advanced haemorrhoids but is associated with considerable postoperative pain and delayed return to normal activities. Minimally invasive procedures such as Doppler-guided Hemorrhoidal Artery Ligation (HAL), Transanal Hemorrhoidal Dearterialization (THD), and Recto-Anal Repair (RAR) have been developed to reduce postoperative morbidity.

The present technique combines arterial ligation with continuous spiral ligation of the haemorrhoidal column. This modification simultaneously decreases arterial inflow, reduces prolapse, and fixes redundant mucosa without tissue excision.

AIM AND OBJECTIVES

Primary Objective

To assess the effectiveness of HAL with Spiral Ligation in reducing symptoms of Grade II and Grade III internal haemorrhoids.

Secondary Objectives

To evaluate postoperative pain.

To assess reduction in prolapse.

To evaluate postoperative complications.

To assess recurrence rates.

To determine patient satisfaction.

MATERIALS AND METHODS

Study Design

Prospective Pilot Study.

Study Setting

Department of Shalya Tantra, Tertiary Care Teaching Hospital.

Sample Size

15 Patients.

Study Duration

6 Months.

Inclusion Criteria

Patients aged 18–65 years.

Grade II internal haemorrhoids.

Grade III internal haemorrhoids.

Patients willing to participate.

Exclusion Criteria

Grade IV haemorrhoids.

Thrombosed external haemorrhoids.

Anal fissure or fistula.

Coagulopathy.

Pregnancy.

Previous anorectal surgery.

PREOPERATIVE ASSESSMENT

All patients underwent:

Detailed clinical history.

General physical examination.

Digital rectal examination.

Proctoscopic examination.

Routine laboratory investigations.

SURGICAL TECHNIQUE

After spinal anaesthesia, the patient was positioned in lithotomy position.

Figure 1

Operative setup demonstrating patient positioning and exposure of anal canal using a self-illuminated anal retractor. The haemorrhoidal cushion was identified and exposed adequately.



Figure 2

Initial placement of absorbable polyglactin suture at the apex of the haemorrhoidal pedicle following arterial ligation. The first ligature was applied to interrupt arterial inflow to the haemorrhoidal tissue.



Figure 3: Continuous spiral ligation of the haemorrhoidal column.

A running spiral suture was passed through the submucosal layer from proximal to distal direction. Sequential bites created tissue plication and progressive reduction of the haemorrhoidal mass.

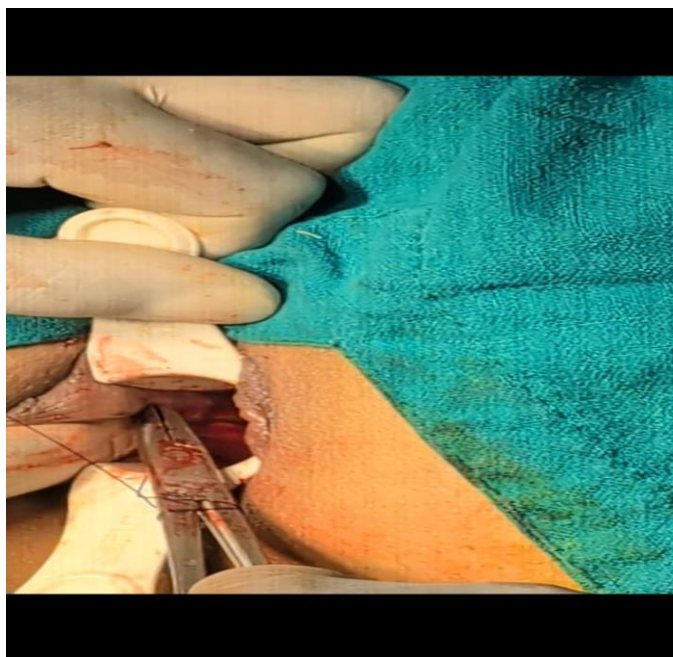


Figure 4: Completion of spiral ligation and final mucopexy.

Upon tightening the suture, the prolapsed mucosa was repositioned proximally, achieving haemostasis and reduction of prolapse.



OBSERVATIONS AND RESULTS

Table 1: Distribution According to Grade.

Grade	Number	Percentage
Grade II	8	53.33%
Grade III	7	46.67%

Table 2: Presenting Symptoms.

Symptom	Number	Percentage
Bleeding	15	100%
Prolapse	12	80%
Pain	9	60%
Pruritus	6	40%

Table 3: Postoperative Outcome.

Outcome	Number	Percentage
Complete Relief	13	86.67%
Partial Relief	2	13.33%
Recurrence	0	0%

Table 4: Mean VAS Pain Score.

Follow-up	Score
Day 1	5.8
Day 3	2.7
Day 7	0.8

Complications

Complication	Number
Minor Bleeding	1
Urinary Retention	1
Major Complications	0

DISCUSSION

HAL aims to reduce haemorrhoidal blood flow through ligation of terminal branches of the superior rectal artery.

However, prolapse may persist despite successful dearterialization. The present modification combines arterial ligation with spiral plication of the haemorrhoidal mass, thereby addressing both vascular congestion and mucosal prolapse.

The technique demonstrated excellent symptom control with minimal postoperative pain. Continuous spiral ligation resulted in circumferential tissue compression, reduction in vascularity, and mucosal fixation.

Compared with conventional haemorrhoidectomy, this procedure preserves anal anatomy and avoids excision-related complications. No major complications were encountered, and patient satisfaction was high.

Although the sample size was limited, the results suggest that this modification may serve as an effective alternative for Grade II and Grade III haemorrhoids.

NOVELTY OF THE TECHNIQUE

The present technique represents a modification of conventional HAL-RAR.

Distinctive features include:

Single running spiral ligation.

Simultaneous dearterialization and mucopexy.

No tissue excision.

Reduced operative time.

Minimal postoperative pain.

Cost-effective approach.

Sphincter preservation.

This technique combines the principles of HAL, THD, mucopexy, and spiral plication into a single procedure.

CONCLUSION

Hemorrhoidal Artery Ligation with Spiral Ligation of the haemorrhoidal mass is a safe, minimally invasive, and effective treatment for Grade II and Grade III internal haemorrhoids. The procedure provides excellent symptomatic relief with minimal postoperative discomfort and early return to routine activities. Larger randomized controlled trials with longer follow-up are required to validate these findings.

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