

Minimally Invasive Procedure for Haemorrhoids: A Retrospective Observational Study

MOUNISH RAJ NAGULA¹, YASH ROHATGI², ABHIJIT JOSHI³

ABSTRACT

Introduction: The Minimally Invasive Procedure for Haemorrhoids (MIPH), also known as Stapled Haemorrhoidopexy (SH), has gained significant recognition and praise within the surgical community due to its speed and minimal postoperative pain. It was initially believed to have superior postoperative outcomes, resulting in reduced morbidity and mortality rates compared to traditional procedures. However, long-term follow-up data has now revealed previously undocumented sequelae and complications associated with SH.

Aim: To share authors' experience with SH, including patient demographics, operative details, recurrence rates, and postoperative complications, in a tertiary corporate teaching hospital.

Materials and Methods: The present retrospective observational study was conducted at the Department of General Surgery and Advanced Laparoscopic Surgery, Dr. LH Hiranandani Hospital, Powai, Mumbai, Maharashtra, India. The study utilised data from the outcomes of SH performed by a single surgeon

for Grade II and III haemorrhoids over a 15-year period, from December 2007 to December 2022. Data was extracted from the hospital's Electronic Medical Records (EMR) and supplemented with information obtained through a telephonic questionnaire. A standard, prevalidated, semi-structured case record proforma was used for data collection. The parameters under study included donut completeness, haemorrhage, faecal urgency, urinary retention, anal stenosis, postoperative pain scores, return to work, and recurrence. Proportions, percentages, and means were calculated and reported for different groups.

Results: A total of 245 patients were enrolled in the study. The average pain score at 12 hours postoperatively was 4, which decreased to 2 by day 10. Recurrent disease was observed in 16 patients (6%) at three months and in 24 patients (10%) at six months.

Conclusion: The SH demonstrated advantages over conventional open surgery by causing significantly lower postoperative morbidity. However, its recurrence rates were slightly higher.

Keywords: Electronic medical records, Haemorrhoids, Haemorrhoidectomy, Haemorrhoidopexy, Stapled

INTRODUCTION

Haemorrhoids, one of the oldest and most prevalent ailments in human history, have been referenced in ancient texts and scriptures from various cultures such as the Greek, Egyptian, Indian, Babylonian, and Hebrew [1]. Symptomatic haemorrhoidal disease, also known as piles, is a chronic condition that has been extensively documented throughout history. Internal haemorrhoids, which are symptomatic anal cushions located at 3, 7, and 11 o'clock positions, involve the enlargement and distal displacement of normal anal cushions. This condition affects millions of individuals worldwide, presenting a significant medical and socio-economic challenge [2,3]. Internal haemorrhoids are positioned above the dentate line and covered with mucous membrane, while external haemorrhoids lie below the dentate line, covered by skin, and tend to be more painful. Prolapse of haemorrhoids (Grade II-IV) can lead to additional symptoms such as mucus discharge, pruritus, loss of discrimination and continence to flatus, and occasional faecal incontinence.

Various treatment options are available for Grade II and III haemorrhoids, including Stapled Haemorrhoidopexy (SH), banding, sclerotherapy, laser ablation, infrared coagulation, cryo-coagulation, harmonic-ultrasonic coagulation, doppler-guided artery ligation, and the conventional Milligan-Morgan's haemorrhoidectomy. The rationale for choosing SH as the preferred option lies in its lower short-term recurrence rates compared to other minimally invasive options, as well as its reduced morbidity compared to conventional haemorrhoidectomy [4]. Among the available therapeutic options, SH is preferred due to its minimally invasive nature and favourable long-term outcomes.

Despite its popularity and apparent benefits, SH has not been extensively evaluated through large-scale studies. The present study

aimed to share the authors' experience with SH and contribute to the existing literature on its postoperative outcomes.

MATERIALS AND METHODS

The present retrospective observational study was conducted at Department of General Surgery and Advanced Laparoscopic Surgery, Dr. LH Hiranandani Hospital, Powai, Mumbai, Maharashtra, India, from December 2007 to December 2022.

Inclusion and Exclusion criteria: The study included 245 patients who underwent stapled haemorrhoidopexy (SH) for Grade II and III haemorrhoids. Patients with Grade IV disease and those who opted for conventional Milligan-Morgan's haemorrhoidectomy were excluded from the study.

Study Procedure

Data was collected from the hospital's Electronic Medical Records (EMR) for all patients who underwent SH performed by a single surgeon. A postgraduate qualified clinical associate collected the data, which was then reviewed and stratified by the consultant. Postoperative follow-up data, including pain, haemorrhage, faecal urgency, and urinary retention, was recorded on a predesigned proforma during the 10th day Outpatient Department (OPD) visit. A standard questionnaire was used for telephonic interviews with the patients at 1, 3, and 6 months postoperatively to assess adverse events, including pain, haemorrhage, urinary symptoms, faecal urgency, and recurrence of preoperative symptoms. Patients reporting symptoms during these interviews were called for a detailed consultation and clinical examination in the surgical OPD.

The grading of haemorrhoids was based on size, with Grade I referring to internal disease, Grade II indicating haemorrhoids that

prolapse during defaecation but spontaneously reduce, Grade III indicating haemorrhoids that do not spontaneously reduce but can be manually repositioned, and Grade IV indicating haemorrhoids that cannot be completely reduced manually [5].

All patients underwent SH and were followed up for six months postoperatively. Intraoperative, immediate postoperative, and late postoperative complications were evaluated. Intraoperative complications included bleeding (assessed by the number of gauze pieces used apart from the standard two mops) and incomplete firing of the stapler (deduced by an incomplete doughnut). Postoperative bleeding was measured by the number of soaked mops and gauze pieces, with grading divided into four classes based on the percentage of blood loss [6]. Immediate postoperative complications were evaluated at 6 and 12 hours after the operation and included urinary retention requiring catheterisation, pain score assessed by the Visual Analogue Scale (VAS), bleeding, and faecal urgency. Late postoperative complications were evaluated at 10 days and at 1, 3, and 6 months and included pain, systemic sepsis, recurrence, faecal incontinence, anal stenosis, bleeding, thrombosis of the haemorrhoidal mass, and return to work.

The operative technique involved using the PPH® stapler kit from Ethicon. Antibiotics (Inj. Augmentin and Inj. Metronidazole) were administered for prophylaxis. An anal pack coated with Lignocaine jelly was inserted into the anorectum after the procedure and removed the next day. Patients were then discharged on same day with instructions for sitz baths and follow-up appointments.

The parameters studied included age, sex, American Society of Anaesthesiology (ASA) grade, previous medical and surgical history, grade of disease, surgical details (duration, donut integrity, haemorrhage), length of hospital stay, and immediate postoperative events (pain score, haemorrhage grade, urinary retention at 6 and 12 hours after surgery).

STATISTICAL ANALYSIS

The statistical analysis for the present study was conducted using Statistical Package for the Social Sciences (SPSS) version 22.0 software. Proportions, percentages, and means were calculated for the different groups and reported.

RESULTS

The study included a total of 245 patients. The age distribution of the patients was as follows: upto 30 years 44 (18%), 31-40 years 53 (22%), 41-50 years 53 (22%) 51-60 years 44 (18%), 61-70 years 35 (14%) and 71-80 years 16 (6%). The average age of the patients was 46±15 years. Out of the 245 patients, 30 (12%) were females and 215 (88%) were males. Grade II disease was observed in 132 (54.0%) of the patients, while Grade III disease was observed in 113 (46.0%) [Table/Fig-1].

Characteristics	Total number of patients, n=245
Age	46±15 years
Male	215
Female	30
Grade II disease	132
Grade III disease	113
Mean surgery duration	31.1 minutes (S.D 5.97)
Return to work	Mean= 6.3±1.25 days
Incomplete donut	15% (n=36)

[Table/Fig-1]: Demographic data of the patients undergoing MIPH.

Urinary retention was reported in 63 (26%) of patients at 6 hours postoperatively and in 56 (23%) at 12 hours postoperatively. Out of these, 90 (75%) patients were 50 years and above, while the remaining 29 (25%) were below 50 years of age. All cases of

urinary retention were managed by simple rubber per urethral catheterisation, followed by urology consultation, if necessary.

Postoperative haemorrhage decreased over time. It decreased from 44 (18%) patients within six hours to 39 (16%) patients between 6-12 hours and finally to 24 (10%) patients after 10 days. The most common causes of postoperative bleeding were staple line bleeding and minor mucosal bleeding. All patients experienced Grade I haemorrhage. No patients developed severe postoperative bleeding requiring blood transfusion or immediate reexploration. Conservative management with Tranexamic acid and follow-up wound examinations was effective in controlling bleeding. No patients reported bleeding after 3 and 6 months post surgery.

No recurrences were observed within the first 10 days. However, the number of recurrences increased after 3 and 6 months, with 16 (6%) and 24 (10%) patients experiencing recurrence, respectively. Out of the 40 patients who experienced recurrence, 32 had Grade III disease and the remaining eight had Grade II disease prior to surgery. Recurrences were managed in the OPD with local applications and laxatives.

Anal stenosis was observed in 24 (10%) patients after 3 months and in 29 (12%) patients after 6 months. All affected patients were managed through self-dilation techniques, and no surgical intervention was required. No patients developed life-threatening complications such as systemic sepsis, and no female patients developed rectovaginal fistulas.

The incidence of incomplete donut formation after firing the stapler was 36 (15%). In these cases, the staple line was carefully inspected, and additional sutures were taken at the site of the deficiency using 2-0 Prolene. The postoperative complications observed in the present study are summarised in [Table/Fig-2,3].

Complications	Grade-II disease (n=132)	Grade-III disease (n=113)
Urinary Retention	59	60
Bleeding	50	57
Faecal urgency	25	38
Systemic sepsis	None	None
Thrombosis distal to staple line	None	None
Recurrence	8	32
Anal stenosis	20	34
Recto-vaginal fistula	None	None

[Table/Fig-2]: Comparison of MIPH complications between Grade-II and III disease (N=245).

Symptoms	After 6 hours	After 12 hours	POD -10	3 months	6 months
Urinary retention	63 (26%)	56 (23%)	5 (2%)	Nil	Nil
Pain (average VAS score)	7	4	2	Nil	Nil
Bleeding	44 (18%)	39 (16%)	24 (10%)	Nil	Nil
Faecal urgency	24 (10%)	24 (10%)	29 (12%)	10 (4%)	Nil
Systemic sepsis	Nil	Nil	Nil	Nil	Nil
Thrombosis distal to staple line	Nil	Nil	Nil	Nil	Nil
Recurrence	Nil	Nil	Nil	15 (6%)	24 (10%)
Anal stenosis	Nil	Nil	Nil	24 (10%)	29 (12%)

[Table/Fig-3]: Evolution of complications along the postoperative timeline (N=245). POD: Postoperative day

DISCUSSION

The surgical procedure under study is commonly known as SH or the Longo procedure. It was first described by Dr. Antonio Longo in 1993 and has since been widely accepted in Europe and around the

Authors	Journal of publication	Type of study/ Sample size (no. of patients)	Year of study/place	Methods	Conclusion
Nisar PJ et al., [8]	Disease of colorectum	Randomised control trial/1077	2004/UK	Comparative study between MIPH and open surgery	Recurrence rates ranging from 5.7 to 8.7%
Malkar B and Košorok P [9]	Techniques in coloproctology	Retrospective analysis/30	2003/Saudi Arabia	Complications of stapled haemorrhoidectomy studied	Postoperative faecal urgency seen in 3% patient
Uras C et al., [10]	World J Surg	Retrospective analysis/445	2008/Turkey	MIPH case experience	Postoperative faecal urgency seen in 0-25% cases
Ravo B et al., [11]	Tech Coloproctol	Retrospective analysis/1107	2002/Italy	Complications of stapled haemorrhoidectomy studied	Postoperative faecal urgency seen in 8.28% cases
Chik B et al., [15]	Asian Journal of Surgery	Retrospective analysis/204	2006/Hong Kong	Factors affecting urinary retention following MIPH studied	Urinary retention maximum in 1 st 12 hours
Kairaluoma M et al., [16]	Journal of disease of colorectum	Randomised control trial/60	2003/Finland	Comparative study between MIPH and open surgery	*Postoperative bleeding seen in first 12 hours- 2% *2-20% postoperative bleeding seen
Oughriess M et al., [17]	Gastroenterol Clin Biol	Randomised control trial/550	2005/France	Complications of stapled haemorrhoidectomy studied	Minor postoperative bleeding seen -1.8%
Kim JS and Vashist YK, [18]	Journal of Gastrointestinal Surgery	Randomised control trial/130	2013/Germany	Comparative study between MIPH and open surgery	Postoperative bleeding seen in 4.9% patients
Khubchandani I et al., [19]	Tech Coloproctol	Randomised control trial/2642 questionnaires	2009/Worldwide	Complications of stapled haemorrhoidectomy studied	Postoperative anal stenosis in 0-15% patients
Aggarwal H et al., [20]	The Internet Journal of Surgery	Randomised control trial/50	2007/India	Comparative study between MIPH and open surgery	Mean return to work is about 7 days

[Table/Fig-4]: Review of literature [8-11,15-20].

world [2]. SH involves the removal of enlarged haemorrhoidal tissue and repositioning of the remaining tissue to its normal position. It is less painful and associated with faster healing compared to the traditional Milligan-Morgan's haemorrhoidectomy. However, the chance of symptomatic haemorrhoids returning is higher, and therefore it is recommended only for Grade II or III disease [7]. The recurrence rate for conventional haemorrhoidectomy is 6.9% [8].

During the SH procedure, a circumferential purse-string suture is placed proximal to the dentate line. A specialised stapler is then introduced transanally, and when closed and fired, it excises the excessive rectal mucosa and submucosa while simultaneously stapling the defect closed. The procedure aims to remove redundant mucosa that contributes to prolapsed hemorrhoids and restore the normal anatomy of the hemorrhoids. By interrupting the blood supply to the vascular cushions, the size of the internal hemorrhoids is reduced, preventing prolapse and alleviating symptoms. The procedure is performed in an area insensitive to pain, making it relatively painless. It also eliminates the formation of painful wounds in the sensitive anoderm, which is a common issue with excisional techniques. However, SH is not typically recommended for fourth-degree hemorrhoids, as adequate retraction back into the anal canal may not be achieved.

Some reported complications of SH include faecal urgency, with incidence ranging from 0% to 25% in various studies [9,10]. Rectovaginal fistula and anastomotic dehiscence requiring colostomy have also been reported, although they are rare [10-13]. Perforation of the rectum, pneumoretroperitoneum, and pelvic sepsis have also been seen in rare cases [8,14]. Most complications are likely due to errors in the application of the purse-string suture, highlighting the importance of proper training before performing SH. Fortunately, none of these serious complications were observed in the present study [Table/Fig-4] [8-11,15-20].

One strength of the present study is its large sample size. Based on the outcomes observed, the authors recommend SH as the procedure of choice for patients with Grade II and III hemorrhoids.

Limitation(s)

There are several limitations to consider in the present study. Firstly, it was conducted at a single centre, which limits the generalisability of the results to other settings. Additionally, the use of an expensive device, the stapler, may have led to selection bias as not all patients

may have had access to the procedure. The long follow-up period may have also introduced recall bias.

Another limitation is the lack of cost-effectiveness analysis or evaluation of the cost-benefit ratio of the procedure. This information would have been valuable in assessing the economic implications of implementing the present procedure.

Furthermore, the absence of a control group in the present study introduces the potential for bias in the results. Without a comparison group, it is difficult to determine the true effectiveness of the procedure.

CONCLUSION(S)

In conclusion, MIPH is considered a safe procedure and is now considered one of the preferred treatment options for Grade II and III hemorrhoids. It offers advantages such as shorter procedure time, reduced hospital stay, and faster recovery. However, it may not be as effective for higher grade hemorrhoids (Grade IV), and recurrence rates may be slightly higher compared to open surgery for hemorrhoids.

REFERENCES

- [1] Turell R. Hemorrhoids: advances and retreats. *The American Journal of Surgery*. 1960;99(2):154-67.
- [2] Longo A. Treatment of hemorrhoids disease by reduction of mucosa and hemorrhoidal prolapse with a circular stapler suturing device: A new procedure. In *Proceeding of the 6th world Congress of Endoscopic Surgery*, 1998.
- [3] Holley C. History of hemorrhoidal surgery. *South Med J*. 1946;39:536-41.
- [4] Pavlidis T, Papaziogas B, Souparis A, Patsas A, Koutelidakis I, Papaziogas T. Modern stapled Longo procedure vs. conventional Milligan-Morgan hemorrhoidectomy: A randomized controlled trial. *Int J Colorectal Dis*. 2002;17(1):50-53. Doi: 10.1007/s003840100342. PMID: 12018455.
- [5] Lohsiriwat V. Hemorrhoids: from basic pathophysiology to clinical management. *World J Gastroenterol*. 2012;18(17):2009-17. Doi: 10.3748/wjg.v18.i17.2009. PMID: 22563187; PMCID: PMC3342598.
- [6] Townsend CM, Beauchamp RD, Evers BM, Mattox KL. Shock, electrolytes, and fluid. *Sawyer Gordon Smith, Martin Allan Schreiber (Eds), Sabiston textbook of surgery: The biological basis of modern surgical practice (Chapter 4, 21st ed., 2022. Pp.49).*
- [7] Jayaraman S, Colquhoun PH, Malthaner RA. Stapled hemorrhoidectomy is associated with a higher long-term recurrence rate of internal hemorrhoids compared with conventional excisional hemorrhoid surgery. *Dis Colon Rectum*. 2007;50(9):1297-305.
- [8] Nisar PJ, Acheson AG, Neal K, Scholfield JH. Stapled haemorrhoidectomy compared with conventional haemorrhoidectomy: systematic review of randomized controlled trials. *Dis Colon Rectum*. 2004;47(11):1837-45.
- [9] Malkar B, Košorok P. Complications and results after stapled haemorrhoidectomy as a daysurgi.cal procedure. *Tech Coloproctol*. 2003;7(3):164-67.
- [10] Uras C, Baca B, Boler DE. Circular stapled hemorrhoidectomy: experience of a single center with 445 cases. *World J Surg*. 2008;32(8):1783-88.

- [11] Ravo B, Amato A, Bianco V, Boccasanta P, Bottini C, Carriero A, et al. Complications after stapled hemorrhoidectomy: can they be prevented? *Tech Coloproctol.* 2002;6(2):83-88.
- [12] Kanellos I, Zacharakis E, Kanellos D, Pramateftakis MG, Tsachalis T, Betsis D. Long-term results after stapled haemorrhoidopexy for third-degree haemorrhoids. *Tech Coloproctol.* 2006;10:47-49.
- [13] Sutherland LM, Burchard AK, Matsuda K, Sweeney JL, Bokey EL, Childs PA, et al. A systematic review of stapled hemorrhoidectomy. *Arch Surg.* 2002;137(12):1395-406.
- [14] Singer M, Cintron J. New techniques in the treatment of common perianal diseases: stapled hemorrhoidopexy, botulinum toxin, and fibrin sealant. *Surg Clin North Am.* 2006;86(4):937-67. Doi: 10.1016/j.suc.2006.06.009. PMID: 16905418.
- [15] Chik B, Law WL, Choi HK. Urinary retention after haemorrhoidectomy: Impact of stapled haemorrhoidectomy. *Asian J Surg.* 2006;29(4):233-37.
- [16] Kairaluoma M, Nuorva K, Kellokumpu I. Day-case stapled (circular) vs. diathermyhemorrhoidectomy: A randomized, controlled trial evaluating surgical and functional outcome. *Dis Colon Rectum.* 2003;46(1):93-99.
- [17] Oughri M, Yver R, Faucheron JL. Complications of stapled hemorrhoidectomy: A French multicentre study. *Gastroenterol Clin Biol.* 2005;29(4):429-33.
- [18] Kim JS, Vashist YK, Thielges S, Zehler O, Gawad KA, Yekebas EF, et al. Stapled hemorrhoidopexy versus Milligan-Morgan hemorrhoidectomy in circumferential third degree hemorrhoids: long-term results of a randomized controlled trial. *Journal of Gastrointestinal Surgery.* 2013;17(7):1292-98.
- [19] Khubchandani I, Fealk MH, Reed JF 3rd. Is there a post-PPH syndrome? *Tech Coloproctol.* 2009;13(2):141-44.
- [20] Aggarwal H, Bansod R, Lubana P, Jain D, Mathur R. Stapler haemorrhoidopexy as compared to conventional haemorrhoidectomy: A short-term prospective randomised controlled study. *The Internet Journal of Surgery.* 2007;16(1).

PARTICULARS OF CONTRIBUTORS:

1. Resident, Department of General Surgery and Advanced Laparoscopic Surgery, Dr. LH Hiranandani Hospital, Powai, Mumbai, Maharashtra, India.
2. MBBS, DNB, Department of General Surgery and Advanced Laparoscopic Surgery, Dr. LH Hiranandani Hospital, Powai, Mumbai, Maharashtra, India.
3. MBBS, MS, Fellowship in LS, Dip. Adv. LS, Department of General Surgery and Advanced Laparoscopic Surgery, Dr. LH Hiranandani Hospital, Powai, Mumbai, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Mounish Raj Nagula,
B-603, Cinderella Building, Opposite IIT Main Gate, Near Dr. LH Hiranandani Hospital, Powai, Mumbai-400076, Maharashtra, India.
E-mail: mounishraj.nagula@gmail.com

PLAGIARISM CHECKING METHODS: [\[Jain H et al.\]](#)

- Plagiarism X-checker: Mar 07, 2023
- Manual Googling: Jul 31, 2023
- iThenticate Software: Aug 03, 2023 (5%)

ETYMOLOGY: Author Origin**EMENDATIONS:** 6**AUTHOR DECLARATION:**

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **Feb 26, 2023**Date of Peer Review: **Jun 04, 2023**Date of Acceptance: **Aug 04, 2023**Date of Publishing: **Sep 01, 2023**