

A Comparative Study between Stapler and Open Surgical Techniques for Grade III & IV Hemorrhoids: Insights from a Tertiary Care Centre

Dr. Nithin Bangaradka¹, Dr. Rajiv Maharaj², Dr. Anand Vijai³, Dr. Nalakilli V.P⁴, Dr. Palanivelu C⁵

^{1,2,3,4,5}GEM Hospital & Research Institute, Coimbatore, Tamilnadu, India

Corresponding Author Email ID: [nithinbangaradka\[at\]gmail.com](mailto:nithinbangaradka[at]gmail.com)

ORCID ID-0009-0001-4637-6252

Abstract: Hemorrhoids, a prevalent ano-rectal condition, affects approximately 30% of the ano rectal conditions in general population. While initially normal anal cushions, they can become pathological, leading to symptoms like anal bleeding, pain, and prolapse. In 1998, Dr. Antonio Longo introduced stapled hemorrhoidectomy as an alternative to conventional surgical methods. This procedure aims to reduce the size of internal hemorrhoids by interrupting their blood supply. We studied A total of 50 patients with grade III and IV hemorrhoids were randomly assigned to either open hemorrhoidectomy or stapled hemorrhoidectomy groups [nonprobability purposive sampling]. Of 50 patients, 38 (77.5) were males and 12 (22.5%) were females with a male: female ratio being 3:1. The operating time and hospital stay were much less in the stapler hemorrhoidectomy group as compared to the open procedure group. Also, postoperative pain (visual analogue scale) was less in the stapler hemorrhoidectomy group with 40% of patients presenting with pain at one week, 20% at one month and 8% at three months in the open hemorrhoidectomy group whereas 12% presenting as pain in one week, 4% presenting at one month and none presenting at three months in the stapler hemorrhoidectomy group. There was repeat bleeding seen in 12% of cases at three months in the open hemorrhoidectomy group as compared to the stapler hemorrhoidectomy group where no recurrence was found at three months follow-up. Our study underscores the safety and efficacy of stapler hemorrhoidectomy. This technique boasts fewer complications and improved patient compliance, making it a promising option for managing third and fourth-degree hemorrhoids. Skillfully performed stapler hemorrhoidectomy can lead to better outcomes and enhanced reliability in hemorrhoidal surgery.

Keywords: Hemorrhoids; stapled hemorrhoidectomy; open hemorrhoidectomy

1. Introduction

Hemorrhoids, one of the most common ano-rectal conditions, are essentially swollen anal cushions that become pathological, causing bleeding, pain, and protrusion from the anal canal. They affect approximately 30% to 40% of the general population at some point in their lives. It is often suggested that hemorrhoids are a consequence of our upright posture as humans [1]. Hemorrhoids can be categorized as either external or internal. Internal hemorrhoids develop from the sub epithelial plexus above the dentate line in the anal canal, while external hemorrhoids are vascular plexuses located outside the anal canal and covered by skin [2]. Internal hemorrhoids are graded into four stages based on the degree of prolapse, although the symptoms may not necessarily correlate with the severity of the patient's discomfort [3]. According to Goligher's classification, internal hemorrhoids are categorized into four types based on their appearance and degree of prolapse: (1) Grade I: Bleeding present with no prolapse; (2) Grade II: Hemorrhoids prolapse outside the anal canal but spontaneously retract; (3) Grade III: Hemorrhoids prolapse and require manual reduction; and (4) Grade IV: Hemorrhoids remain prolapsed and irreducible, including cases of acutely thrombosed hemorrhoids and those with circumferential prolapse of rectal mucosa [4] Hemorrhoids can manifest in various ways such as bleeding, pain, mucus discharge, itching, and a sensation of something protruding from the rectum [5]. The most common complaint from patients with hemorrhoids is painless rectal bleeding during

bowel movements, often described as blood dripping into the toilet bowl. The blood is typically bright red due to direct arteriovenous communication within the hemorrhoidal tissue [6]. Management of hemorrhoids involves dietary and lifestyle adjustments, stool softeners, laxatives, oral flavonoids, and calcium dobesilate [6]. Conservative treatments are typically used for first and second-degree hemorrhoids, including lifestyle changes, dietary adjustments, and medications [7]. Non-surgical options include sclerotherapy, cryotherapy, rubber band ligation, infrared coagulation, and radiofrequency ablation [7,8]. Nonetheless, hemorrhoidectomy remains the most common surgical procedure, and the minimally invasive procedure for hemorrhoids (MIPH), also known as stapled hemorrhoidopexy, is a newer and safer approach performed globally [9,10]. Dr. Antonio Longo introduced the stapled hemorrhoidectomy in 1998, aiming to reduce the size of internal hemorrhoids by disrupting their blood supply, thereby reducing the size of the vascular anal cushions [11]. The staplers perform an immediate re-anastomosis of mucosa. This study aims to compare the outcomes and complications of stapler hemorrhoidectomy and open hemorrhoidectomy for the management of third and fourth-degree hemorrhoids during the postoperative period and follow-up.

2. Patients & Methods

The present study was prospective type and done among 50 patients in the tertiary care centre with a duration of

6months. Those patients who presented with grade III and IV degree hemorrhoids on clinical examination and willing to give consent were included in the study. Patients with thrombosed piles and associated perianal conditions like abscess, anal fissure and rectal ulcer were excluded from the study. Approval from the institute’s ethical committee was taken before the start of the study and informed consent was also taken from all patients involved in the study. The sampling technique for this study was based on nonprobability purposive sampling. Twenty-five patients each were divided into two groups as open hemorrhoidectomy and stapled hemorrhoidectomy groups. Surgery was carried out under spinal type of anesthesia and patient positioning was done in lithotomy position for all the

cases. Evaluation of postoperative pain was done utilizing visual analogue scale (VAS) ranging from 0 to 10 categorized into mild (0-3), moderate (4-7) and severe (8-10). Follow-up of patients was done at regular intervals at a period of one week, one month and three months. The interpretation of the data was performed using Microsoft Excel (Microsoft® Corp., Redmond, WA). The quantitative data obtained were expressed as percentage in tabular form and were evaluated using SPSS version 20 (IBM Corp., Armonk, NY) by chi-square test with p<0.05 as a significant value.

3. Results & Discussion

Characteristics		Total cases N=50	Stapler Haemorrhoidectomy N=25	Open Haemorrhoidectomy N=25
Age Group (years)	11-30	6	3/25(12%)	3/25 (12%)
	31-50	24	11/25(44%)	13/25 (52%)
	51-70	20	11/25(44%)	9/25 (36%)
Operating time (in minutes)		-	25.5±7.9	46.2±10.7
Hospital stay		-	1±1.2 (in days)	3±1.2 (in days)
Post-operative pain (visual analogue scale at 24 hours post-operative)		-	1.1+/- 0.1	4.5±0.41
Return to activity (Normal routine Work)		-	3±1.5	10±3.2

The study comprised fifty participants, divided equally with 25 individuals in both open and stapler hemorrhoidectomy groups. Out of the total, 38 patients (77.5%) were male, and 12 patients (22.5%) were female, yielding a male-to-female ratio of 3:1. The average age of the patients was 46 years. The largest proportion of patients (48%) fell within the 31 to 50 years age group, followed by 12% in the 11 to 30 years range, and 40% in the 51 to 70 years category. Bleeding was the most prevalent symptom, observed in 92% of cases, followed by a rectal mass (40%). A significant 60% of patients exhibited chronic constipation, indicating its prominence as a leading factor in hemorrhoid development.

When considering surgical aspects, the stapler hemorrhoidectomy group demonstrated multiple advantages over open technique. The operative duration and hospital

stay were notably shorter in the stapler group compared to the open hemorrhoidectomy group. Stapled hemorrhoidectomy had an average operative time of 25 minutes (ranging from 15 to 40 minutes), whereas open hemorrhoidectomy took around 46 minutes (ranging from 30 to 60 minutes), highlighting the efficiency of stapled hemorrhoidectomy. Furthermore, blood loss during stapled hemorrhoidectomy averaged at 10 ml (ranging from 5 to 25 ml), whereas open hemorrhoidectomy had an average blood loss of 35 ml (ranging from 25 to 75 ml), indicating reduced blood loss in stapler hemorrhoidectomy. The discomfort level at the first bowel movement was recorded as 1.1 (mild) in the stapler group, in contrast to 4.1 (moderate) in the open group. This suggests that patients experienced less postoperative pain and greater comfort with stapler hemorrhoidectomy compared to the open procedure.

Table 2: Incidence of various postoperative complications in open and stapler hemorrhoidectomy group

Complications	Open Hemorrhoidectomy Group n=25				Stapler Hemorrhoidectomy Group n=25			
	Total (post-operative till 3 months follow-up)	At 1 week (n=25)	At 1 month (n=25)	At 3 months (n=25)	Total (post-operative till 3 months follow-up)	At 1 week (n=25)	At 1 month (n=25)	At 3 months (n=25)
Pain	18(72%)	10 (40%)	5 (20%)	2 (8%)	16 (64%)	3(12%)	0	0
Bleeding	2 (6.7%)	5(20%)	2(8%)	1(4%)	1(4%)	1(4%)	0	0
Incontinence	1 (4%)	1 (4%)	0	0	0	0	0	0
Recurrence	1 (4%)	0	0	1(4%)	0	0	0	0

The incidence of urinary retention was greater among patients who underwent the open procedure (4%) compared to those who had the stapler surgery (none). There were more instances of emergency visits among the open surgery group, particularly for cases of recurrent bleeding per rectum, as compared to the stapler group. The stapler patients experienced a swifter discharge from the hospital, with an average of 1.1 days, in contrast to the open surgery patients who had an average discharge time of 2.8 days.

Additionally, the stapler group demonstrated a quicker return to normal activities. Notably, a considerable number of stapler hemorrhoidectomy patients could potentially be managed as day care procedures due to their favorable recovery trajectory.

Additionally, postoperative pain, as measured by the visual analogue scale, was lower among patients who underwent stapler hemorrhoidectomy. In the open hemorrhoidectomy

group, 40% of patients reported pain at one week, 20% at one month, and 8% at three months. Conversely, in the stapler hemorrhoidectomy group, only 12% experienced pain at one week, and none reported pain at one or three months.

Recurrent bleeding rates differed as well. In the open hemorrhoidectomy group, a recurrent bleeding was observed in 4% of cases at the three-month mark, whereas in the stapler hemorrhoidectomy group, no instances of recurrent bleeding were observed during the three-month follow-up period.

Table 3: Comparison of various similar studies with our study

Various studies	Operative time (mins)		Hospital stay (days)		Return to normal routine activity (days)	
	Stapler Haemorrhoidectomy	Open Haemorrhoidectomy	Stapler Haemorrhoidectomy	Open Haemorrhoidectomy	Stapler Haemorrhoidectomy	Open Haemorrhoidectomy
Present Study	25+/-15	46±16	1±1.1	3±0.7	4±1.2	14±3.4
Sachin and Muruganathan (2017) [12]	33	44	2	4	8	15
Singh et al. (2018) [1]	<30	<40	1	3	2-7	7-13
Malyadri and Allu (2021)[13]	40 (38-40)	50 (48-51)	1	3	3	5
Surati et al. (2022) [14]	34 (20-50)	40 (20-60)	1.5	2.4	3 (2-8)	20.5 (6-46)

In comparison to other research focusing on the same method, our study showcased comparable levels of blood loss and duration of hospital stay. Furthermore, the operative time for stapled hemorrhoidectomy was marginally shorter in our facility [12,13,14].

4. Conclusion

Stapled hemorrhoidectomy demonstrates better safety and effectiveness, presenting fewer complications and hence better compliance. It stands as a promising treatment option for third and fourth degree hemorrhoids. The technique's success relies on proper training and expertise, highlighting its potential as a reliable method for hemorrhoid surgery. Further studies with more number of patients and a longer period of follow-up are recommended to attain more encouraging results.

Declaration

There is no conflict of interest

This is to certify, that the research paper submitted by me is an outcome of my independent and original work. I have duly acknowledged all the sources from which the ideas and extracts have been taken. The project is free from any plagiarism and has not been submitted elsewhere for publication

References

- [1] Singh SP, Singh SP, Gupta V, Quadri K, Gupta M: Comparison between stapler hemorrhoidectomy and open hemorrhoidectomy in the management of grade III and IV hemorrhoids: a prospective randomized study. *Int Surg J.* 2018, 5:2069-2073. 10.18203/2349-2902.isj20181990
- [2] Rahman A, Hasan M, Ashraf Uddin, Roy PK: Comparative study of outcome of surgical treatment of haemorrhoid between open haemorrhoidectomy and stapled haemorrhoidectomy. *East African Scholars J Med Sci.* 2023, 6:34-39. 10.36349/easms.2023.v06i02.002
- [3] Loder PB, Kamm MA, Nicholls RJ, Phillips RK: Haemorrhoids: pathology, pathophysiology and aetiology. *Br J Surg.* 1994, 81:946-954. 10.1002/bjs.1800810707
- [4] Lohsirawat V: Hemorrhoids: from basic pathophysiology to clinical management. *World J Gastroenterol.* 2012, 18:2009-2017. 10.3748/wjg.v18.i17.2009
- [5] Brisinda G: How to treat haemorrhoids. Prevention is best; haemorrhoidectomy needs skilled operators. *BMJ.* 2000, 321:582-583. 10.1136/bmj.321.7261.582
- [6] Clinical Practice Committee: American Gastroenterological Association medical position statement: diagnosis and treatment of hemorrhoids. *Gastroenterology.* 2004, 126:1461-1462. 10.1053/j.gastro.2004.03.001
- [7] How to treat haemorrhoids. Prevention is best; haemorrhoidectomy needs skilled operators. *Brisinda G. BMJ.* 2000;321:582-583. - PMC - PubMed
- [8] Shalaby R, Desoky A: Randomized clinical trial of stapled versus Milligan-Morgan haemorrhoidectomy. *Br J Surg.* 2001, 88:1049-1053. 10.1046/j.0007-1323.2001.01830.x
- [9] Shalaby R, Desoky A: Randomized clinical trial of stapled versus Milligan-Morgan haemorrhoidectomy. *Br J Surg.* 2001, 88:1049-1053. 10.1046/j.0007-1323.2001.01830.x
- [10] Bota R, Ahmed M, Aziz A: Is stapled hemorrhoidectomy a safe procedure for third and fourth grade hemorrhoids? An experience at Civil Hospital Karachi. *Indian J Surg.* 2015, 77:1057-1060. 10.1007/s12262-014-1140-4
- [11] Longo A: Treatment of hemorrhoid disease by reduction of mucosa and hemorrhoidal prolapse with a circular suturing device: a new procedure. In:

- Proceedings of the 6th World Congress of Endoscopic Surgery, Rome, Italy. Rome; 1998.
- [12] Sachin ID, Muruganathan OP: Stapled hemorrhoidopexy versus open hemorrhoidectomy: a comparative study of short term results. *Int Surg J*. 2017, 4:472-478. 10.18203/2349-2902.isj20164791
- [13] Malyadri N, Allu VJ: A prospective comparative study of stapler hemorrhoidectomy vs open haemorrhoidectomy (Milligan Morgan) in its outcome and postoperative complications. *J Surg Res*. 2021, 4:4-13. 10.26502/jsr.100200104
- [14] Surati K, Modi J, Damani S, Prajapati K, Shah A: Comparative study of management of hemorrhoids: stapler vs open hemorrhoidectomy. *World J Lap Surg*. 2022, 15:8-10. 10.5005/jp-journals-10033-1492
- [15] El-Kelani MZ, Kerdahi R, Raghieb S, et al.: Recommendations and best practice on the management of hemorrhoidal disease in Saudi Arabia. *Hosp Pract*. 2022, 50:104-109. 10.1080/21548331.2022.2042150
- [16] Davis BR, Lee-Kong SA, Migaly J, Feingold DL, Steele SR: The American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the management of hemorrhoids. *Dis Colon Rectum*. 2018, 61:284-292. 10.1097/DCR.0000000000001030
- [17] Sofii I, Darmawan H, Kurniawan F, Hanif AS, Resadita R, Ramadhini AS: A new technique for surgical haemorrhoidectomy without post-operative complication: a case series. *Ann Med Surg (Lond)*. 2022, 76:103467. 10.1016/j.amsu.2022.103467
- [18] Mehigan BJ, Monson JRT, Hartley JE. Stapling procedure for haemorrhoids versus Morgan-Milligan haemorrhoidectomy: randomized control trial. *Lancet*. 2000;355:782–785. doi: 10.1016/S0140-6736(99)08362-2. [PubMed] [CrossRef] [Google Scholar]
- [19] Rowsell M, Hemingway DM. Circumferential mucosectomy (stapled haemorrhoidectomy) versus conventional haemorrhoidectomy: randomized controlled trial. *Lancet*. 2000;355:799–881. doi: 10.1016/S0140-6736(99)06122-X. [PubMed] [CrossRef] [Google Scholar]
- [20] Basdanis G, Harlaftis N, Michalopoulos A, Papadopoulos V, Apostolidis S. Surgical treatment of haemorrhoids with the use of the circular stapler and open haemorrhoidectomy: a comparative study. *Tech Coloproctol*. 2000;4:137–140. doi: 10.1007/PL00012118. [CrossRef] [Google Scholar]
- [21] Beattie G, Loudon M. Circumferential stapled anoplasty in the management of haemorrhoids and mucosal prolapse. *Colorectal Dis*. 2001;2:170–175. doi: 10.1046/j.1463-1318.2000.00126.x. [PubMed] [CrossRef] [Google Scholar]
- [22] Laughlan K, Jayne DG, Jackson D, Rupprecht F, Ribaric G. Stapled haemorrhoidopexy compared to Milligan-Morgan and Ferguson haemorrhoidectomy: a systematic review. *Int J Colorectal Dis*. 2009;24:335–344. doi: 10.1007/s00384-008-0611-0. [PubMed] [CrossRef] [Google Scholar]
- [23] Tjandra JJ, Chan MK. Systematic review on the procedure for prolapse and hemorrhoids (stapled hemorrhoidopexy) Dis Colon Rectum. 2007;50:878–892. doi: 10.1007/s10350-006-0852-3. [PubMed] [CrossRef] [Google Scholar]
- [24] Shao WJ, Li GC, Zhang ZH, et al. Systematic review and metaanalysis of randomized controlled trials comparing stapled haemorrhoidopexy with conventional haemorrhoidectomy. *Br J Surg*. 2008;95:147–160. doi: 10.1002/bjs.6078. [PubMed] [CrossRef] [Google Scholar]
- [25] McCloud JM, Jameson JS, Scott AN. Life-threatening sepsis following treatment for haemorrhoids: a systematic review. *Colorectal Dis*. 2006;8:748–755. doi: 10.1111/j.1463-1318.2006.01028.x. [PubMed] [CrossRef] [Google Scholar]
- [26] Molloy RG, Kingsmore D. Life threatening sepsis after stapled haemorrhoidectomy. *Lancet*. 2000;355:810. doi: 10.1016/S0140-6736(00)02208-X. [PubMed] [CrossRef] [Google Scholar]
- [27] Shalaby R, Desoky A. Randomized clinical trial of stapled versus Milligan-Morgan haemorrhoidectomy. *Br J Surg*. 2001;88:1049–1053. doi: 10.1046/j.0007-1323.2001.01830.x. [PubMed] [CrossRef] [Google Scholar]
- [28] Ravo B, Amato A, Bianco V, Boccasanta P, Bottini C, Carriero A, Milito G, Dodi G, Mascagni D, Orsini S, Pietroletti R, Ripetti V, Tagariello GB. Complications after stapled hemorrhoidectomy: can they be prevented? *Tech Coloproctol*. 2002;6(2):83–88. doi: 10.1007/s101510200018. [PubMed] [CrossRef] [Google Scholar]
- [29] Touzin E, Hegge S, McKinley C. Early experience of stapled hemorrhoidectomy in a community hospital setting. *J Can Chir*. 2006;49(5):316–20. [PMC free article] [PubMed] [Google Scholar]
- [30] Khalil KH, O’Bichere A, Sellu D. Randomized clinical trial of sutured versus stapled closed hemorrhoidectomy. *Br J Surg*. 2000;87:1352–1355. doi: 10.1046/j.1365-2168.2000.01624.x. [PubMed] [CrossRef] [Google Scholar]