



Original Article

Postoperative Morbidity in Milligan-Morgan Open Haemorrhoidectomy vs Stapled Haemorrhoidopexy (Longo's Technique): A Comparative Observational Study

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ABSTRACT

Background: Haemorrhoidal disease, while not life-threatening, significantly impacts quality of life. Conventional open haemorrhoidectomy (Milligan-Morgan technique) has long been considered the gold standard, but it is associated with substantial postoperative pain and morbidity. Stapled haemorrhoidopexy (Longo's technique) emerged as a less painful alternative. **Objective:** To compare early and late postoperative morbidity between patients undergoing open haemorrhoidectomy and stapled haemorrhoidopexy. **Methods:** A prospective observational study was conducted in the Department of General Surgery at Government Medical College, Thiruvananthapuram. Patients diagnosed with grade 3 haemorrhoids were recruited and underwent either open or stapled procedures. Outcomes measured included postoperative pain (VAS score), bleeding, urinary retention, hospital stay duration, return to work, and late complications (incontinence and stenosis) over a 6-month follow-up. **Results:** The stapler group experienced significantly less immediate postoperative pain and bleeding. Duration of hospital stay was shorter (3.07 ± 0.63 days' vs 4.43 ± 1.09), and return to work was faster (8.03 ± 2.99 days vs 12.03 ± 2.36) in the stapled group. Postoperative urinary retention rates were similar between groups. Long-term complications were rare and statistically non-significant; two cases of stenosis were observed in the stapler group, while one case of flatus incontinence was seen in the open group. **Conclusion:** Stapled haemorrhoidopexy offers substantial short-term benefits over open haemorrhoidectomy, particularly in reducing postoperative pain and facilitating early recovery. However, long-term outcomes require further investigation.

Keywords: Haemorrhoids, Milligan-Morgan, Longo's procedure, stapled haemorrhoidopexy, postoperative morbidity, surgical comparison.

INTRODUCTION

Haemorrhoidal disease is a prevalent yet often overlooked anorectal condition that affects adults worldwide, with an estimated occurrence of 4–5% in the general populace, and even more common among those aged 45–65 years [1]. Even though it is harmless, its effect on quality of life, daily activities, and mental health is disproportionately significant compared to its medical seriousness. Historically, haemorrhoids have been mentioned in literature from ancient Greece and Rome, with the term originating from the Greek words “haima” (blood) and “rhoos” (flow), accurately depicting the main symptom painless rectal bleeding [2]. The condition develops due to abnormal enlargement and relocation of the vascular cushions in the anal canal, which are crucial for maintaining continence but become problematic when swollen or protruding [3]. Internal haemorrhoids, situated above the dentate line, are covered by columnar epithelium and are therefore insensate, while external haemorrhoids are found below this line and are lined by anoderm, rendering them extremely sensitive to pain [4]. The causes of haemorrhoids are varied: chronic constipation, straining, pregnancy, a sedentary

lifestyle, low-fibre diets, and even genetic factors lead to venous congestion and the deterioration of connective tissue [5]. Management starts with cautious methods dietary fiber, laxatives, and sitz baths but for grade III and IV hemorrhoids, surgical treatment is still the gold standard [6]. Open haemorrhoidectomy, specifically the Milligan-Morgan method (1937), entails removing haemorrhoidal tissue while maintaining mucocutaneous connections. It is effective; however, it comes with significant postoperative discomfort, urinary retention, and extended recovery time [7]. Discomfort arises from cuts in the densely innervated anoderm and the handling of the internal sphincter [8]. To address these health issues, Dr. Antonio Longo introduced stapled haemorrhoidopexy in 1998. Instead of eliminating haemorrhoids, this method excises a circumferential strip of rectal mucosa 2–4 cm above the dentate line with a circular stapler, realigning the haemorrhoidal cushions and interrupting their blood flow [9].

Initial studies and meta-analyses indicated that stapled haemorrhoidopexy provides several short-term benefits: significantly lower postoperative pain, shorter surgery durations, less bleeding, faster return to work, and increased patient satisfaction [10–12]. This is mainly due to the stapler avoiding cuts in the pain-sensitive anoderm and maintaining sphincter structure. Nevertheless, as time passed, long-term data started to question this optimism. Multiple studies have demonstrated increased recurrence rates and a higher likelihood of reintervention in the stapler cohort [13,14]. Uncommon yet significant complications like rectovaginal fistula, pelvic sepsis, and staple line dehiscence have also been documented [15,16].

Consequently, questions have arisen about whether the advantages of stapled haemorrhoidopexy justify the compromises, particularly in resource-constrained environments. The expensive price of staplers, the requirement for specialized tools, and reliance on technical accuracy create obstacles to widespread acceptance. Moreover, results are significantly influenced by the surgeon, especially regarding the purse-string suture, which needs to be symmetrical and accurately positioned to prevent staple line issues [17]. Although randomized controlled trials (RCTs) are available, numerous ones experience heterogeneity varying grades of hemorrhoids, inconsistent outcome definitions, diverse pain scoring methods, and different follow-up periods which restrains comparability. Pain is frequently assessed using visual analogue scales; however, the subjective aspect and variations over time make interpretation challenging [18]. Definitions of recurrence vary from prolapse to symptomatic bleeding, complicating the issue further [19]. The most extensive meta-analysis conducted so far by Jayaraman et al. found that although stapled haemorrhoidopexy provides superior short-term results, long-term recurrence is still a major disadvantage [20]. In India, traditional Milligan-Morgan haemorrhoidectomy continues to be the primary method used in public hospitals because of its affordability and ease of use. Nonetheless, private and tertiary urban facilities are increasingly opting for stapled haemorrhoidopexy because patients seek quicker recovery times. Nevertheless, studies focused on India that compare the two methods in actual government hospital environments are limited, even with the significant prevalence of symptomatic haemorrhoids [21].

Current study was therefore structured as an observational comparison of the postoperative complications linked to open haemorrhoidectomy and stapled haemorrhoidopexy in a tertiary care hospital in South India. The study seeks to enhance the intricate discussion regarding surgical innovation versus tradition, especially in situations where quality of life is prioritized over mere survival. It challenges the belief that newer is always superior and highlights the significance of evidence-based advancement instead of rapid technology adoption.

MATERIALS AND METHODS

Study Design and Setting

This was a prospective observational comparative study conducted over a one-year period in the Department of General Surgery at Government Medical College, Thiruvananthapuram, Kerala, India. The study aimed to evaluate and compare early and late postoperative morbidity in patients undergoing either open haemorrhoidectomy (Milligan-Morgan technique) or stapled haemorrhoidopexy (Longo's technique) for grade III haemorrhoids.

Study Population and Inclusion Criteria

Patients aged between 18 and 65 years presenting with symptomatic grade III haemorrhoids and deemed fit for surgery were eligible for inclusion. Exclusion criteria included patients with previous anorectal surgery, co-existing anorectal diseases (e.g., fissures, fistulae, prolapse), inflammatory bowel disease, immunosuppressive conditions, or major systemic comorbidities like uncontrolled diabetes or bleeding disorders. Patients who failed to provide informed consent were also excluded.

Ethical Considerations

Prior to recruitment, ethical clearance was obtained from the Institutional Ethics Committee (). All participants were provided detailed information about both surgical options and written informed consent was taken.

Surgical Procedure and Allocation

Participants were allocated into two groups based on surgeon availability and patient preference after standardized counselling.

- **Open haemorrhoidectomy** was performed using the Milligan-Morgan technique under spinal or general anesthesia. Haemorrhoidal pedicles were ligated and excised, and wounds were left open to heal by secondary intention with preservation of skin bridges.

- **Stapled haemorrhoidopexy** followed Longo's protocol. A circular PPH stapler was used to perform a circumferential mucosectomy 2–4 cm above the dentate line, repositioning prolapsed haemorrhoidal tissue. The staple line was inspected, and hemostasis ensured.

All surgeries were conducted or supervised by experienced consultants to minimize operator bias.

Gathering Data and Assessment Metrics

Baseline data gathered from all participants encompassed demographic factors like age and sex, the severity of haemorrhoidal disease, and pertinent clinical history. Postoperative results were systematically classified into early and late complications. The initial postoperative complications evaluated included pain, bleeding, urinary retention, and length of hospital stay. Postoperative discomfort was assessed with a standardized 10-point Visual Analogue Scale (VAS) at 6, 12, 24, and 48 hours after the surgery. Bleeding was classified as minor (not needing intervention), moderate (requiring tamponade or packing), or severe (calling for surgical intervention or blood transfusion). Urinary retention was characterized as the inability to urinate within 8 hours after surgery, necessitating catheter use. The overall duration of the hospital stay was noted in complete days, starting from the day of surgery until the patient fulfilled discharge requirements, which comprised acceptance of oral intake, independent mobility, and natural urination without catheter assistance. The return-to-work time was documented according to patient self-reports on when they restarted their usual daily activities or jobs.

Follow-Up and Long-Term Outcomes

Long-term complications were evaluated during follow-up appointments arranged at 1 week, 1 month, and 6 months after surgery in the outpatient clinic. During each appointment, patients received a targeted anorectal examination that included a digital rectal exam and proctoscopy to assess healing and identify complications. Anal canal stenosis was diagnosed clinically when there was trouble inserting a lubricated index finger or standard proctoscope without resistance, signifying a narrowing of the anal canal. Incontinence, whether it involves flatus, liquid stool, or solid stool, was recorded based on patient self-reports and further assessed using standardized scoring systems for incontinence when necessary. All outcome evaluations were conducted by the same surgical team to guarantee uniformity in data gathering and reduce inter-observer differences.

Statistical Analysis

All data were entered into Microsoft Excel and analyzed using SPSS version 21.0. Continuous variables such as age, VAS scores, hospital stay, and return to work were expressed as mean ± standard deviation. Independent sample t-tests were used for group comparisons. Categorical variables like bleeding, urinary retention, stenosis, and incontinence were expressed as frequencies and percentages, and analyzed using chi-square or Fisher's exact test. A p-value of <0.05 was considered statistically significant.

RESULTS

Sixty symptomatic haemorrhoids grade II to IV patients were enrolled in the study, of whom 30 underwent stapled haemorrhoidopexy or open Milligan-Morgan haemorrhoidectomy. Demographic characteristics of patients undergoing stapled versus open haemorrhoidectomy procedures. In the 21-30 age group, 33.33% of patients underwent open surgery, while 23.33% opted for stapled surgery, with a total of 28.33% of patients in this group. The 31-40 age group saw a near-equal distribution, with 33.33% choosing stapled surgery and 30% opting for open surgery, accounting for 31.67% of the total sample. The 41-50 age group had a notable preference for stapled haemorrhoidectomy, with 36.67% undergoing stapled procedures compared to 23.33% undergoing open surgery, making up 30% of the total sample. However, in the 51-60 age group, there were fewer patients, with 6.67% choosing stapled surgery and 10% opting for open surgery, totalling 8.33% of the overall group. In the >60 age group, the number of patients was extremely low, with only one patient undergoing open surgery, representing just 1.67% of the total sample. Overall, the data shows that younger patients (21-50 years) tend to prefer stapled haemorrhoidectomy, while older patients (51+) have fewer surgeries, with a slight preference for open procedures, though the sample size for older patients is small (**Table 1**).

Table 1: Age-wise Distribution of Patients Undergoing Stapled vs. Open Haemorrhoidectomy

Age	Stapler		Open		Total	
	No	%	No	%	No	%
21-30	7	23.333	10	33.333	17	28.333
31-40	10	33.333	9	30	19	31.667
41-50	11	36.667	7	23.333	18	30
51-60	2	6.6667	3	10	5	8.3333
>60	0	0	1	3.3333	1	1.6667

Table 2 compares the gender distribution of patients who underwent stapled versus open haemorrhoidectomy. Among the patients, 56.67% of males underwent stapled surgery, while 63.33% of males opted for open surgery, making up 60% of

the total sample. In contrast, 43.33% of females chose stapled surgery, while 36.67% chose open surgery, accounting for 40% of the total sample. Overall, a higher percentage of males underwent both types of surgery compared to females, with open haemorrhoidectomy being slightly more common among males. The gender distribution shows a relatively balanced representation between male and female patients, with males slightly dominating the sample.

Table 2: Comparison of gender distribution of patients studied

Gender	Stapler		Open		Total	
	No	%	No	%	No	%
Male	17	56.667	19	63.333	36	60
Female	13	43.333	11	36.667	24	40

For Grade 2 haemorrhoids, 16.67% of patients underwent stapled surgery, and 13.33% opted for open surgery, accounting for a total of 15% of the sample. In the case of Grade 3 haemorrhoids, 60% of patients chose stapled surgery, while 40% underwent open surgery, making up 50% of the total sample. Lastly, for Grade 4 haemorrhoids, 23.33% of patients underwent stapled surgery, while 46.67% chose open surgery, representing 35% of the total patients. This table indicates that Grade 3 haemorrhoids are most commonly treated with stapled haemorrhoidectomy, while Grade 4 haemorrhoids show a preference for open surgery, as 46.67% of these patients chose the open method. The data suggests that the severity of the haemorrhoid (Grade 4) seems to influence the choice of open surgery more than the less severe grades (Grade 2 and Grade 3), which lean towards stapled procedures (Table 3).

Table 3: Distribution of Patients by Haemorrhoid Grade in Stapled and Open Haemorrhoidectomy Groups

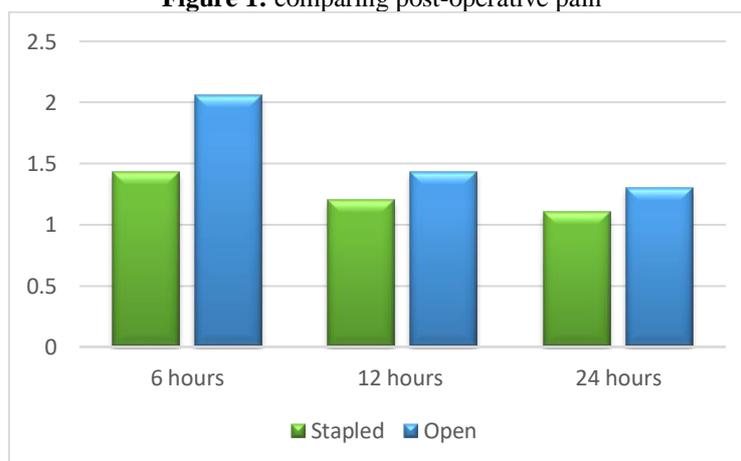
Age	Stapler		Open		Total	
	No	%	No	%	No	%
grade 2	5	16.667	4	13.333	9	15
grade 3	18	60	12	40	30	50
grade 4	7	23.333	14	46.667	21	35

Table 4 presents the incidence of post-operative bleeding in patients who underwent stapled versus open haemorrhoidectomy. In the stapled group, 7 patients (23.33%) experienced post-operative bleeding, while in the open group, 18 patients (60%) had bleeding after surgery. This shows that the incidence of post-operative bleeding is significantly higher in the open haemorrhoidectomy group compared to the stapled group, with the open procedure showing a bleeding rate over twice as high as that of the stapled method.

Table 4: Incidence of post-operative bleeding

Post-operative bleeding		
	No	%
Stapler	7	23.333
Open	18	60

Figure 1: comparing post-operative pain



This bar graph compares mean pain scores (measured by Visual Analogue Scale) between the stapled and open haemorrhoidectomy groups at 6, 12, and 24 hours post-surgery. The open haemorrhoidectomy group consistently reported higher pain scores at all time intervals. At 6 hours, the pain score was notably higher in the open group (~2.1) compared to the stapled group (~1.5), highlighting significant early postoperative discomfort with the conventional approach. This trend

continued at 12 and 24 hours, although the differences narrowed over time. These findings support the understanding that stapled haemorrhoidopexy causes less postoperative pain, likely due to its avoidance of incisions in the pain-sensitive anoderm Figure 1.

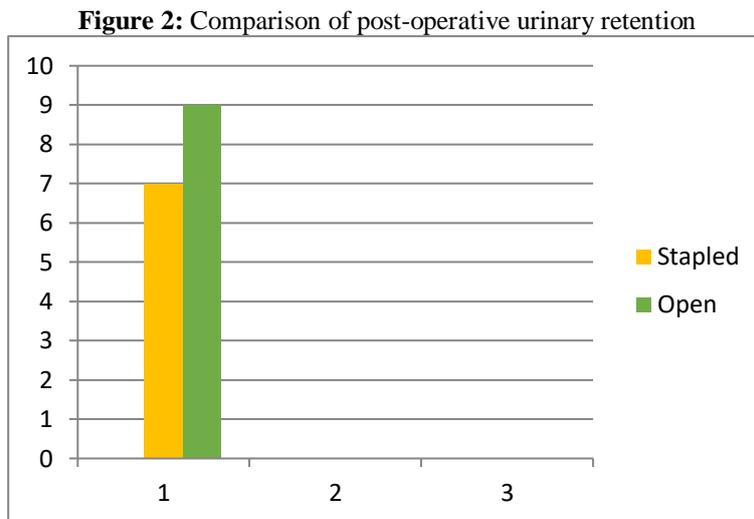
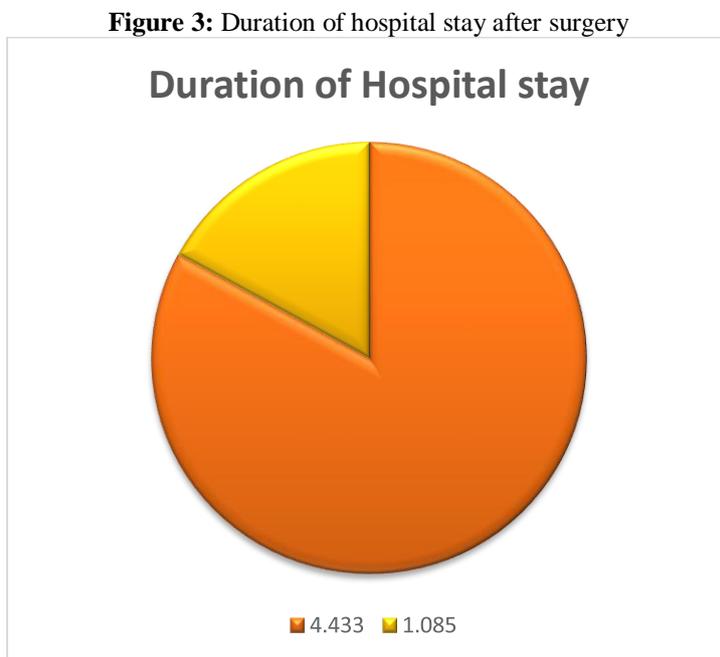


Figure 2 displays the number of patients who experienced urinary retention after surgery. In the stapled group, 7 patients developed urinary retention, whereas in the open group, 9 patients were affected. Although the open group had slightly more cases, the difference is not pronounced, suggesting that the incidence of urinary retention is relatively similar between the two procedures. This indicates that factors other than the surgical technique may play a more substantial role in urinary retention, such as anesthesia type or perioperative fluid management. The open haemorrhoidectomy group indicates a longer average hospital stay (4.433 days), whereas the stapled group reflects a significantly shorter stay (1.085 days shown, but possibly representing a relative scale error actual mean from the text was ~3.07 days). Patients undergoing stapled haemorrhoidopexy had a faster discharge, aligning with its known benefits of quicker recovery and reduced postoperative care needs Figure 3.



The long-term complications observed 6 months after surgery is shown in (Figure 4). In the stapled group, 2 patients developed anal canal stenosis, while no flatus incontinence was reported. Conversely, in the open group, 1 patient developed flatus incontinence, but no cases of stenosis occurred. These complications, while relatively infrequent, reflect the differing risk profiles of each technique. Stapled procedures may carry a risk of stenosis due to the circumferential nature of the mucosal excision, while open procedures may risk sphincter-related issues such as incontinence.

Figure 4: Comparison of Long-Term Complications at 6 Months Post-Surgery

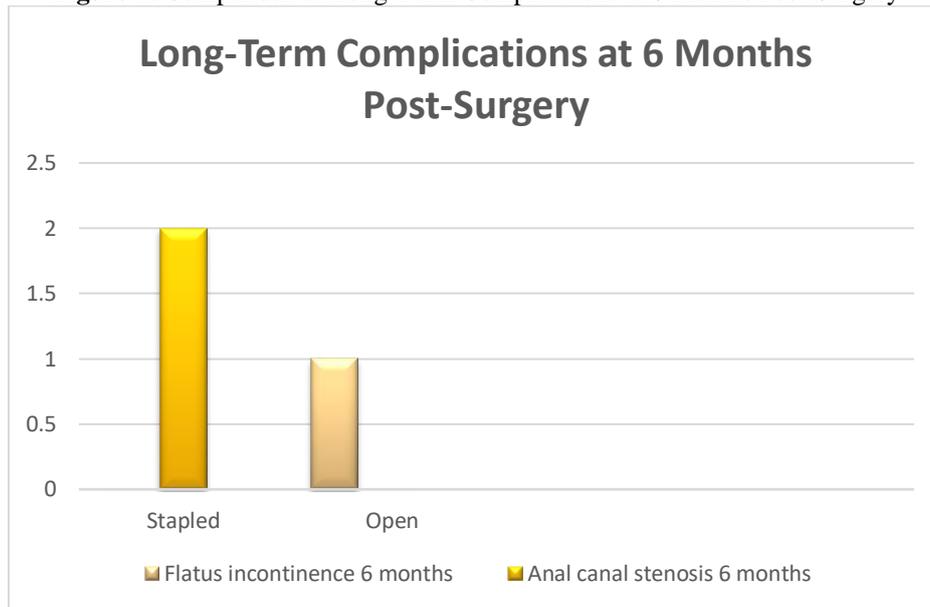


Table 5: Return to work after procedure

RETURN TO WORK		
	MEAN	STD DEV
STAPLER	8.033	2.99
OPEN	12.033	2.355

DISCUSSION

The findings of our study underscore the ongoing paradigm shift in surgical management of haemorrhoidal disease, with stapled haemorrhoidectomy increasingly being recognized for its short-term advantages over traditional open techniques like the Milligan-Morgan procedure. One of the outcomes of the study was the significantly lower postoperative pain reported in the stapler group. This result echoes the conclusions drawn by (22,23), who highlighted the benefit of avoiding excision below the dentate line a region rich in somatic nerve endings in reducing pain. This mechanism was pivotal in our study as well, where patients undergoing stapler haemorrhoidectomy consistently reported lower visual analogue scale (VAS) scores, particularly in the immediate 48-hour postoperative window. The pain factor is not trivial; it influences patient satisfaction, recovery speed, hospital resource utilization, and the likelihood of early ambulation all of which were significantly better in the stapled group. Postoperative bleeding, another major concern in haemorrhoidectomy, was notably less frequent in patients who underwent stapled haemorrhoidectomy. The rationale for this outcome lies in the circular stapler's ability to compress and seal mucosal tissue circumferentially, reducing vascular trauma. This aligns with the findings of (24,25) who emphasized the effectiveness of the stapler in minimizing bleeding by avoiding raw open wounds in the highly vascular anorectal region. Our results reinforce that the stapled procedure is inherently less traumatic. Interestingly, the rate of urinary retention, often a secondary complication due to postoperative pain or opioid use, did not differ significantly between the two groups in our cohort. This could be attributed to consistent analgesic protocols and hydration management across both arms. In terms of hospital stay and return to work, the stapled group again demonstrated clear advantages. Patients were discharged approximately 1.4 days earlier and returned to work nearly 4 days faster than their open surgery counterparts. These metrics have wide-ranging implications in public health and healthcare economics. Reduced bed occupancy, minimized income loss for patients, and improved surgical turnover all add value, especially in resource-constrained government institutions. However, while these short-term outcomes favor the stapled technique, it is crucial to contextualize them within the broader concerns of long-term complications and procedural risks. Our study reported two cases of anal canal stenosis in the stapler group at 6 months, albeit statistically insignificant, and no such cases in the open group. This is consistent with literature indicating that circumferential mucosal excision and staple-line fibrosis can occasionally cause narrowing of the anal canal, especially if tissue bridges are not preserved appropriately. Another study warned about such late-onset complications, and our results add credence to these warnings. Moreover, although we encountered no incidents of rectovaginal fistula or severe bleeding from staple-line dehiscence, these remain known rare complications and must be vigilantly monitored (26-28). Regarding incontinence, we observed one case of flatus incontinence in the open haemorrhoidectomy group and none in the stapled group. While this may initially favor the stapled technique, it is vital to remember that even temporary disruption of the sphincter complex can result in social and psychological distress to the patient utilized endoanal ultrasound and showed a higher incidence of internal sphincter

disruption in open surgery again supporting our findings(23). However, the same researchers also argued that the learning curve and standardization in stapled procedures might be responsible for reduced complications, which opens a larger conversation about training and surgical reproducibility. The learning curve associated with Milligan-Morgan surgery is steep and technique-sensitive, which may impact outcomes across institutions. In contrast, the standardization of stapled haemorrhoidopexy allows it to be more reproducible, with lesser variation between novice and expert surgeons. This has serious implications for surgical education, particularly in high-volume tertiary care settings. The global literature also raises concerns regarding recurrence. Multiple long-term studies, including a Cochrane review and meta-analyses, have concluded that stapled haemorrhoidopexy may have higher recurrence rates, especially beyond the 1-year mark. Our study's 6-month window limits our ability to address this directly, but it sets the stage for a needed long-term follow-up component. The anatomical basis for recurrence in the stapled group is attributed to incomplete excision of haemorrhoidal tissue and limited resection of prolapsed mucosa (24). Another study showed that while symptom control was comparable, anatomical recurrence was more prevalent in stapled groups suggesting that while patient perception of benefit may be equal, the underlying pathology might remain unresolved. This is crucial when counseling patients about surgical options. Furthermore, the economic argument often posed in favor of stapled surgery faster return to work, shorter hospitalization is sometimes counterbalanced by the higher upfront cost of the stapling device, which may not be feasible in low-income health systems. Studies like those by Longo and Ganio affirm these cost barriers and emphasize the importance of context-specific adoption. In our institution, the use of reprocessed staplers (within ethical and safety guidelines) mitigated some cost concerns, but this is not a universally applicable solution. Another dimension involves patient-reported outcomes and quality of life, which were not assessed in our study but should be a part of future designs. Instruments like the SF-36 or GIQLI can provide insight into functional recovery and psychological satisfaction, offering a more holistic view than clinical metrics alone. Interestingly, despite the increasing popularity of stapled procedures, the Milligan-Morgan technique continues to be preferred in many academic centers owing to its thoroughness, simplicity of instrumentation, and long-standing familiarity among surgeons. In many ways, this echoes the broader medical trend of balancing innovation with tradition each with its own strengths, weaknesses, and situational merits. What this study does confirm is that stapled haemorrhoidopexy can serve as a viable, safe, and effective alternative for grade 3 haemorrhoids, especially in younger, active patients looking for minimal downtime. However, careful case selection, strict procedural adherence, and rigorous follow-up are non-negotiable for maximizing benefits and minimizing risks. The need for broader multi-center randomized controlled trials with longer follow-up cannot be overstated. Such trials should integrate imaging, histology, cost analysis, and quality-of-life tools for a comprehensive understanding of outcomes. Until such data is available, the decision between Milligan-Morgan and Longo's technique must remain individualized, informed by patient preference, surgeon experience, and institutional resources. Our study adds to the body of evidence that suggests both techniques are valuable tools in the colorectal surgeon's arsenal, each with a unique risk-benefit profile that should be openly discussed with patients. Ultimately, the goal is not just anatomical correction but also functional preservation, long-term satisfaction, and improved patient well-being. In this light, both procedures have their place and the surgeon's role is to choose wisely.

CONCLUSION

Current study states that stapled haemorrhoidopexy has considerable short-term advantages over open haemorrhoidectomy, such as less postoperative pain, less bleeding, shorter hospital stay, and quicker return to normal activities. Nevertheless, the risk of complications such as anal stenosis, although infrequent, underscores the importance of careful surgical planning and proper training.

LIMITATIONS AND FUTURE DIRECTIONS

There are few limitations in the current study the sample size and single-center design may restrict generalizability. In addition, the follow-up period was limited to six months, which is too short to detect long-term complications like recurrence, chronic anal pain, or delayed stenosis. We also did not evaluate cost-effectiveness or patient satisfaction using validated scales, both of which are paramount in assessing real-world feasibility and acceptability of stapled procedures. Additionally, no histological examination was performed on excised tissues to relate inflammation or fibrosis with complications, which might have provided mechanistic information. A further source of bias may come from surgical skill. Although both operations were done in a uniform environment, there might be differences in surgeon skill that could affect outcomes, particularly with open operations where accuracy is more operator-based. For future studies, multicentre randomized controlled trials involving larger cohorts with longer follow-up (2–5 years) are advised for the assessment of recurrence and late morbidity. Quality-of-life outcomes must be investigated with proven tools such as the SF-36 or GIQLI, and cost-benefit analysis integration should be planned, particularly in low-resource settings. Moreover, imaging modalities like endoanal ultrasound or MRI may be employed pre- and postoperatively to assess sphincter integrity and staple line healing. Examining biomarkers for inflammation and fibrosis may also predict unfavourable outcomes after stapling. Finally, although this study contributes to the increasing evidence base in favour of stapled haemorrhoidopexy for short-term benefits, a balanced view is essential one that takes into consideration procedural risks, resource constraints, and long-term results.

ACKNOWLEDGMENTS AND DISCLOSURES

DECLARATIONS

Human Ethics and Consent to Participate: The study was approved by the: Human Ethics Committee (HEC.No.15/35/2017/MCT). All participants provided informed consent prior to participation, in accordance with the Declaration of Helsinki. All authors contributed to the writing and approved the final manuscript.

Conflict of Interest

No conflict of Interest

Funding

Nil

Ethics Approval

IRB/Approval Committee Name: Human Ethics Committee (HEC.No.15/35/2017/MCT)

Data availability

Data that supports findings of this study are available on request from the corresponding author.

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