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Original Research Article

Comparison of Outcome Associated with Open Hemorrhoidectomy versus Stapled Hemorrhoidectomy in Patients with 3rd and 4th Degree Hemorrhoids

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Abstract: *Hemorrhoidal disease represents one of the most prevalent anorectal disorders globally, frequently necessitating surgical management in advanced stages (Grade III and IV). Among the available surgical techniques, open hemorrhoidectomy (OH) and stapled hemorrhoidopexy (SH) are widely practised, each with distinct advantages and limitations. In resource-limited healthcare settings such as Pakistan, determining the most effective and patient-centred approach remains a clinical priority. This study aimed to compare outcomes of OH and SH with respect to operative time, intraoperative blood loss, postoperative pain, and hospital stay.* ***Methods:*** *A randomized controlled trial was conducted in the Department of Surgery of Nishtar Hospital, Multan, from February 2023 to February 2024. Sixty patients with Grade III and IV hemorrhoids were enrolled using non-probability consecutive sampling and randomly allocated into two groups: Group A underwent stapled hemorrhoidectomy. In contrast, Group B underwent open hemorrhoidectomy using the Milligan–Morgan technique. Consultant surgeons performed all surgeries with at least 5years' post-fellowship experience. Key outcome measures included operative time, intraoperative blood loss, postoperative pain (assessed via Visual Analogue Scale at 24 hours), and duration of hospital stay. Data were analyzed using SPSS v23, with a p-value ≤ 0.05 considered statistically significant.* ***Results:*** *The mean age of participants was 44.8 ± 10.3 years, with a male predominance (63.3%). The stapled group demonstrated significantly shorter operative time (17.8 ± 3.9 min vs. 28.6 ± 4.2 min, p < 0.001), reduced intraoperative blood loss (25.4 ± 8.5 ml vs. 52.3 ± 10.7 ml, p < 0.001), lower postoperative pain scores (VAS 2.4 ± 0.8 vs. 5.7 ± 1.2, p < 0.001), and a markedly shorter hospital stay (2.6 ± 0.7 days vs. 5.3 ± 1.5 days, p < 0.001) compared with the open group. Post-stratification by age, gender, and obesity revealed no significant influence on these outcomes (p > 0.05). No major postoperative complications or mortality were reported.* ***Conclusion:*** *Stapled hemorrhoidectomy offers substantial advantages over open hemorrhoidectomy, including reduced operative time, minimal blood loss, lower postoperative pain, and a shorter hospital stay, leading to faster recovery and improved patient comfort. These benefits, coupled with comparable safety, make SH a preferable choice for managing advanced hemorrhoidal disease in tertiary-care hospitals in Pakistan. However, cost-effectiveness analysis is warranted to evaluate its wider applicability in low-resource settings.*

Keywords: Hemorrhoids, Stapled hemorrhoidopexy, Open hemorrhoidectomy, Postoperative pain, Hospital stay, Randomized controlled trial

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Introduction

Hemorrhoids are prevalent among middle-aged adults, significantly impacting their quality of life. They are generally classified based on symptom severity, ranging from Grade I to Grade IV. Surgical intervention is often recommended for severe cases, particularly Grade III and Grade IV hemorrhoids, when conservative treatments are unsuccessful (1, 2).

The surgical management of hemorrhoids has evolved with techniques like open hemorrhoidectomy (OH) and stapled hemorrhoidopexy (SH). There is ongoing discourse regarding which method yields superior outcomes (3, 4). Open hemorrhoidectomy, particularly the Milligan-Morgan technique, is characterized by the complete excision of hemorrhoidal tissues. While this method is recognized for its effectiveness, it carries a higher risk of postoperative pain, extended recovery times, and complications such as urinary retention and anal stenosis (5, 6).

Conversely, stapled hemorrhoidopexy is appreciated for its minimally invasive nature, resulting in reduced surgical time and postoperative pain, which can lead to a quicker recovery and a faster return to daily activities (7, 8). However, some studies report that stapled hemorrhoidopexy is associated with higher recurrence rates than open techniques (3, 6). A systematic review has indicated that while stapled hemorrhoidopexy generally results in less postoperative pain and a quicker recovery, concerns about long-term outcomes—specifically recurrence rates and complications—persist and remain varied in the literature (2, 9). Factors such as surgical technique, surgeon skill, and patient characteristics significantly influence postoperative outcomes, emphasizing the need for comprehensive comparisons in future studies (3, 4).

In Pakistan, the healthcare system faces challenges in managing surgical diseases like hemorrhoids, exacerbated by resource limitations. The increased prevalence of hemorrhoidal disease can be attributed partly to dietary habits, particularly low fiber intake (10). Given these socio-economic factors, establishing clear protocols comparing open hemorrhoidectomy and stapled hemorrhoidopexy could improve surgical outcomes, enhance patient satisfaction, and address both immediate and long-term therapeutic needs within the context of local healthcare realities.

Thus, both open hemorrhoidectomy and stapled hemorrhoidopexy exhibit distinct advantages and disadvantages. Conducting comparative analyses can help refine surgical approaches tailored to individual patient profiles and the socio-cultural and economic contexts prevalent in Pakistan, potentially enhancing treatment efficacy and quality of life for patients suffering from advanced hemorrhoidal disease.

Methodology

This randomized controlled trial was conducted in the Department of Surgery at Nishtar Hospital, Multan, following ethical approval from the Institutional Review Committee, from February 2023 to February 2024. The study was designed to compare the outcomes associated with open hemorrhoidectomy and stapled hemorrhoidectomy among patients

presenting with 3rd and 4th-degree hemorrhoids. The study duration was six months following approval of the synopsis by the College of Physicians and Surgeons Pakistan (CPSP). A total of 60 patients who met the inclusion criteria were enrolled using a non-probability, consecutive sampling technique. The calculated sample size of 60 (30 per group) was based on expected differences in mean hospital stay between stapled hemorrhoidectomy (2.52 ± 0.76 days) and open hemorrhoidectomy (5.36 ± 1.62 days), with 95% confidence and 80% power, using OpenEpi software.

Patients aged between 25 and 65 years of either gender, scheduled for surgical management of grade III or IV hemorrhoids, were eligible for inclusion. Patients with recurrent hemorrhoids, rectal carcinoma, or thrombosed hemorrhoids on clinical examination were excluded from the study. After obtaining written informed consent, eligible patients were randomly assigned to one of two groups using sealed, opaque envelopes. Group A underwent stapled hemorrhoidectomy using a circular stapling device, while Group B underwent conventional open hemorrhoidectomy (Milligan–Morgan technique). All procedures were performed by consultant surgeons with at least five years of post-fellowship experience, ensuring technical consistency. Standard anesthesia protocols were followed for all patients.

Operative time was measured from the induction of anesthesia to extubation of the endotracheal tube and recorded in minutes by nursing staff using a stopwatch. Intraoperative blood loss was estimated by measuring the volume of blood collected in suction bottles and the weight difference of surgical sponges, assuming a 1-gram increase equaled 1 ml of blood. Postoperative pain was assessed at 24 hours using a 10-point Visual Analogue Scale (VAS), where 0 indicated no pain and 10 represented the worst imaginable pain. Hospital stay was recorded in days from the date of surgery to discharge, which was defined as the date the patient experienced minimal pain and no active bleeding. Obesity status was assessed using body mass index (BMI), calculated as weight in kilograms divided by height in meters squared; BMI > 27.5 kg/m² was classified as obese.

All collected data were documented in a structured proforma developed for the study. Data were analyzed using SPSS version 23. Quantitative variables, including age, operative time, intraoperative blood loss, postoperative pain score, and hospital stay, were presented as mean and standard deviation. Qualitative variables such as gender and obesity status were presented as frequencies and percentages. The independent-samples t-test was used to compare the means between the two groups, and a p-value ≤ 0.05 was considered statistically significant. Stratification by age, gender, and obesity was performed to assess their effects on outcomes. Post-stratification independent-samples t-tests were used to ensure the validity of the findings across subgroups.

Results

A total of 60 patients were enrolled, with 30 patients in each group: Group A (Stapled Hemorrhoidectomy, SH) and Group B (Open Hemorrhoidectomy, OH). The mean age of participants was 44.8 ± 10.3 years, ranging from 26 to 65 years. In the stapled group, the mean age was 45.1 ± 9.8 years, and in the open group, 44.5 ± 10.7 years (p = 0.84). Males constituted 63.3% (n = 38) and females 36.7% (n = 22) of the total study population. Obesity (BMI > 27.5 kg/m²) was observed in 23.3% (n = 14) of patients. No significant demographic difference was found between groups (p > 0.05). (Table 1).

The mean operative time was significantly shorter in the stapled group (17.8 ± 3.9 min) than in the open group (28.6 ± 4.2 min; p < 0.001). Intraoperative blood loss was also less in the stapled group (25.4 ± 8.5 ml) than in the open group (52.3 ± 10.7 ml, p < 0.001).Patients undergoing stapled hemorrhoidectomy experienced less postoperative pain (VAS = 2.4 ± 0.8) compared to the open group (VAS = 5.7 ± 1.2, p < 0.001). Similarly, the mean hospital stay was markedly shorter in the stapled group (2.6 ± 0.7 days) than in the open group (5.3 ± 1.5 days; p < 0.001). (Table 2).

The mean operative time, intraoperative blood loss, and hospital stay were all significantly lower in patients undergoing stapled hemorrhoidectomy than in those undergoing open hemorrhoidectomy. Postoperative pain was also substantially lower in the stapled group, allowing earlier discharge and a return to normal activity. No intraoperative mortality or severe postoperative complications were recorded. These findings are consistent with international and regional studies indicating the superiority of stapled hemorrhoidectomy for early postoperative recovery, though the procedure remains more costly.

Post-stratification revealed that age, gender, and obesity did not significantly influence operative time, blood loss, pain score, or hospital stay between the two groups (p > 0.05), demonstrating the consistency of results across subgroups. (Table 3).

Table 1: Demographic Characteristics of Patients (n = 60)

Variable	Stapled Hemorrhoidectomy (n = 30)	Open Hemorrhoidectomy (n = 30)	Total (n = 60)	p-value
Age (years) (Mean ± SD)	45.1 ± 9.8	44.5 ± 10.7	44.8 ± 10.3	0.84
Gender				
Male	19 (63.3%)	19 (63.3%)	38 (63.3%)	1.00
Female	11 (36.7%)	11 (36.7%)	22 (36.7%)	
Obesity (BMI > 27.5 kg/m²)	7 (23.3%)	7 (23.3%)	14 (23.3%)	1.00

Table 2: Comparison of Operative and Postoperative Parameters between Groups

Outcome Variable	Stapled Hemorrhoidectomy (Mean ± SD)	Open Hemorrhoidectomy (Mean ± SD)	p-value
Operative Time (minutes)	17.8 ± 3.9	28.6 ± 4.2	< 0.001
Intraoperative Blood Loss (ml)	25.4 ± 8.5	52.3 ± 10.7	< 0.001
Postoperative Pain (VAS at 24 h)	2.4 ± 0.8	5.7 ± 1.2	< 0.001
Hospital Stay (days)	2.6 ± 0.7	5.3 ± 1.5	< 0.001

Table 3: Stratified Analysis of Hospital Stay According to Demographic Variables

Variable	Category	Mean Hospital Stay (Days)	p-value
Age (years)	≤45	SH = 2.5 ± 0.6 / OH = 5.2 ± 1.4	0.001
	>45	SH = 2.7 ± 0.8 / OH = 5.4 ± 1.6	0.001
Gender	Male	SH = 2.6 ± 0.7 / OH = 5.2 ± 1.3	< 0.001
	Female	SH = 2.5 ± 0.6 / OH = 5.4 ± 1.6	< 0.001
Obesity	Non-obese	SH = 2.6 ± 0.7 / OH = 5.3 ± 1.5	< 0.001
	Obese	SH = 2.7 ± 0.8 / OH = 5.4 ± 1.6	< 0.001

Discussion

In recent years, surgical techniques for the treatment of third and fourth-degree hemorrhoids have progressed significantly, primarily focusing on two main methods: stapled hemorrhoidopexy (SH) and open hemorrhoidectomy (OH). Your study, which enrolled 60 patients, demonstrates noteworthy differences in outcomes between these two approaches. The results presented effectively contribute to a growing body of literature indicating the measurable benefits of one technique over the other.

First, the demographic characteristics reported in Table 1 of your study align with the recent literature, showing that the mean age of participants was similar and that there were no significant differences in gender or obesity rates between the two groups ($p > 0.05$). This corresponds with the observations made by Shaukat et al., where similar demographic distributions were noted, emphasizing that relevant comparisons can be made without the confounding effects of age and sex Shaukat et al. [11]. However, the study by Gefen et al. suggests a need for further research on long-term outcomes based on demographic distributions (12).

As presented in Table 2, the stapled group exhibited a significantly lower mean operative time (17.8 ± 3.9 min) compared to the open group (28.6 ± 4.2 min, $p < 0.001$). Research has consistently supported these findings, with studies such as those by Kumar et al. documenting that SH required less operative time than OH (13). Furthermore, intraoperative blood loss was reduced in the stapled group (25.4 ± 8.5 ml) compared with the open technique (52.3 ± 10.7 ml; $p < 0.001$), corroborating the findings of Ghafoor et al., who observed lower blood loss with SH (14). These outcomes underscore the advantage of SH in minimizing both the duration of surgery and operational complications linked to excessive bleeding.

Table 2 outlines significant differences in postoperative pain: the visual analog scale (VAS) at 24 hours was 2.4 ± 0.8 in the stapled group versus 5.7 ± 1.2 in the open group ($p < 0.001$). This aligns with a study by Rahman et al., which found that SH significantly reduced postoperative pain (15). Similarly, Sharma and Farooque reported reduced postoperative discomfort, affirming the potential for SH to improve patient postoperative experiences (16). The reduction in pain shown in your results can translate into enhanced patient satisfaction, greater adherence to follow-up care, and improved overall wellbeing.

Another striking difference noted in your study is the duration of hospital stay: the stapled group stayed an average of 2.6 ± 0.7 days, compared with the open group's 5.3 ± 1.5 days ($p < 0.001$). This outcome is supported by research from Hassan et al., emphasizing shorter hospitalization times associated with SH (17). A meta-analysis of multiple studies found that patients undergoing SH have significantly shorter recovery times, allowing a faster return to daily activities than those undergoing traditional OH techniques (18).

Your post-stratification analysis reveals that factors such as age, gender, and obesity did not significantly influence the operative time, blood loss, pain scores, or hospital stay ($p > 0.05$). This result is significant in bolstering the validity of the findings by demonstrating that the outcomes were consistent across various demographic subgroups. Similar observations are echoed in other studies, providing reassurance that the benefits of SH over OH do not differ significantly among diverse populations (19, 20).

The findings from your study align well with recent research, highlighting the benefits of stapled hemorrhoidopexy over open hemorrhoidectomy for the treatment of third- and fourth-degree hemorrhoids, including improved operative efficiency, reduced postoperative pain, and shorter hospital stays. However, it is essential to acknowledge the higher costs associated with the stapled method, as reported in the literature (15). Hence, for the Pakistani context, where healthcare resources may be limited, discussing the cost-benefit Ratio of these approaches is critical for clinical decision-making.

Implementing guidelines that optimize surgical techniques based on this accumulating evidence could improve healthcare outcomes in Pakistan, significantly enhancing the management of hemorrhoidal disease and improving patient quality of life.

Conclusion

Stapled hemorrhoidectomy proved to be a superior surgical technique compared to open hemorrhoidectomy for the treatment of third- and fourth-degree hemorrhoids, demonstrating significantly reduced operative duration, intraoperative bleeding, postoperative pain, and hospitalization time. Given its clinical efficacy and favorable recovery profile, SH should be considered the procedure of choice in tertiary-care surgical practice in Pakistan, provided that cost and device availability are adequately addressed.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-23)

Consent for publication

Approved

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Conflict of interest

The authors declared no conflict of interest.

Author Contribution

MH

Manuscript drafting, Study Design,
Review of Literature, Data entry, Data analysis, and drafting an article.

ZA

Conception of Study, Development of Research Methodology Design, Study Design, manuscript review, and critical input.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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