Journal of Cardiovascular Disease Research
ISSN: 0975-3583,0976-2833 VOL 15, ISSUE 12, 2024

Original Research

Comparative Analysis of Open & Closed Hemorrhoidectomy: Evaluating the Postoperative Outcomes and Patient Satisfaction

Dr . Arinjaya Jain[1], Dr. Sushma Jain[2], Dr. Sahil Malik[3]

[1]Associate Professor, General Surgery, World College Of Medical Sciences And Research And Hospital, Jhajjar, Haryana
[2]Assistant Professor General Surgery, World College Of Medical Sciences And Research And Hospital, Jhajjar, Haryana
[3]Postgraduate, General Surgery, World College Of Medical Sciences And Research And Hospital, Jhajjar, Haryana

Corresponding Author:
Dr. Arinjaya Jain
Associate Professor, General Surgery, World College Of Medical Sciences And Research And Hospital, Jhajjar, Haryana

Received Date:16 Octobar 2024 Accepted Date: 27 November 2024

Abstract
Background: Haemorrhoidectomy is the standard treatment for advanced haemorrhoids. Open (Milligan-Morgan) and closed (Ferguson) techniques are widely used, but their comparative outcomes remain debated. This study evaluates postoperative pain, healing time, operative duration and patient satisfaction between the two methods.
Methods: A prospective study was conducted with 50 patients (25 in each group) presenting with Grade III or IV haemorrhoids. Open hemorrhoidectomy was performed using the Milligan-Morgan method, while the closed technique followed the Ferguson method. Postoperative pain was assessed using a 0–10 scale at Day 1, Week 1 and Week 3. Healing time, hospital stay and complications were recorded. Statistical analysis was performed, with $p < 0.05$ considered significant.
Results: Patients in the closed group reported lower pain levels compared to the open group, particularly by Week 3. Healing time was significantly shorter for the closed group (2.8 weeks vs. 3.5 weeks; $P < 0.001$). Operative time was shorter in the open group (17 minutes vs. 25 minutes; $P < 0.001$). Satisfaction scores were higher for the closed group (4.2 vs. 3.8; $P = 0.01$). Complication rates, including bleeding and infection, were low and comparable in both groups.
Conclusion: The closed technique reduces postoperative pain, speeds healing and improves patient satisfaction, though it requires longer operative time. The open method remains suitable in high-volume or resource-limited settings. Findings can guide technique selection based on patient needs and clinical contexts.

Introduction

Haemorrhoids are a common anorectal condition affecting many people worldwide. Nearly half of all individuals above 50 experience symptoms like bleeding, pain, itching and prolapse, which can disrupt daily life. Advanced haemorrhoids, particularly Grades III and IV, often need surgery when other treatments fail, making haemorrhoidectomy one of the most widely performed procedures in this field.[1,2]

There are two main techniques for haemorrhoidectomy. The open method, developed in 1937, involves removing the haemorrhoids and leaving the wound open to heal naturally. It is simple and widely used but often causes more pain and slower healing. The closed method, introduced in 1952, involves stitching the wound after removing the haemorrhoids. This usually leads to faster healing and less bleeding but can take more time in surgery.[3,4]

Both techniques have their challenges. Pain after surgery is a major concern for most patients, especially in the first week. Healing time and risks like infections and bleeding vary depending on the method used. Hospital stay and overall patient satisfaction are also important. While many studies look at these techniques, direct comparisons between them are limited, making it difficult to decide the better option in different situations.[5,6]

Studies comparing these methods are important. They help doctors understand which technique works better for reducing pain, speeding up recovery and improving patient satisfaction. This knowledge can make treatments more effective and benefit both patients and healthcare providers.

The aim of this study is to compare the open and closed haemorrhoidectomy techniques. It focuses on pain levels, healing time, hospital stay and satisfaction to find the most effective and patient-friendly option for treating advanced haemorrhoids.

Materials and Methods

Study Design

This study was a prospective, comparing open and closed hemorrhoidectomy. Patients were assigned to one of two groups: Group A (open hemorrhoidectomy) or Group B (closed hemorrhoidectomy). Each group included 25 patients, selected based on inclusion criteria.

Study Population

Patients presenting with Grade III or IV haemorrhoids at the General Surgery Department were enrolled.

Inclusion criteria:

- Aged 20–60 years
- No concomitant anal conditions (e.g., fistulas, fissures, abscesses)

Exclusion criteria:

- Anal malignancies
- History of prior anal surgeries

Patients were assessed preoperatively for demographics, symptoms (bleeding, pain) and any prior interventions.

Technique

Open hemorrhoidectomy was performed using the Milligan-Morgan method, where excised tissue was left to heal by secondary intention. The closed technique followed the Ferguson method, where wounds were sutured using absorbable sutures.[3-5]

Postoperative Assessment

Pain was assessed using a linear pain scale (0–10) at Day 1, Week 1 and Week 3. Healing time and hospital stay were recorded. Complications, including bleeding, infection and urinary retention, were noted.

Statistical Analysis

Data were analysed using chi-square and Fisher's exact tests for categorical variables. A p-value of <0.05 was considered statistically significant. Percentages were recalculated to ensure consistency in sample representation (n=25 per group).

Results

Table 1: Patient Demographics and Clinical Presentation

Parameter	Open Hemorrhoidectomy (n=25)	Closed Hemorrhoidectomy (n=25)	p-value
Mean Age (years ± SD)	39.5 ± 8.5	41.2 ± 9.2	0.38
Male (%)	60% (15)	56% (14)	0.76
Female (%)	40% (10)	44% (11)	0.76
Primary Symptom: Bleeding (%)	92% (23)	88% (22)	0.67
Secondary Symptom: Pain (%)	20% (5)	12% (3)	0.71

The average age of patients in the open group was 39.5 years, compared to 41.2 years in the closed group. Both groups had a higher proportion of males (60% in open, 56% in closed). Bleeding was the most common symptom, seen in 92% of patients in the open group and 88% in the closed group. Pain was reported by 20% of the open group and 12% of the closed group.

Table 2: Postoperative Pain (Pain Scores at Day 1 and Week 1)

Pain Score	Day 1 Open (n=25)	Day 1 Closed (n=25)	Week 1 Open (n=25)	Week 1 Closed (n=25)
Mild (1-4) (%)	32% (8)	40% (10)	32% (8)	36% (9)
Moderate (5-7) (%)	48% (12)	44% (11)	48% (12)	52% (13)
Excruciating (8-10) (%)	20% (5)	16% (4)	20% (5)	12% (3)

On Day 1, all patients reported some level of pain, with mild pain experienced by 32% in the open group and 40% in the closed group. Moderate pain was most common, affecting 48% in the open group and 44% in the closed group, while excruciating pain was reported by 20% and 16%, respectively. By Week 1, pain levels showed improvement in both groups, with mild pain reported by 32% in the open group and 36% in the closed group. Moderate pain persisted in 48% of the open group and increased slightly to 52% in the closed group, while excruciating pain reduced to 20% in the open group and 12% in the closed group. These results suggest that while both techniques lead to postoperative pain, the closed method showed a trend toward quicker relief from severe pain.

Table 3: Healing Time and Duration of Stay with Complications

Parameter	Open Hemorrhoidectomy (n=25)	Closed Hemorrhoidectomy (n=25)	p-value
Healing Time (weeks ± SD)	3.5 ± 0.5	2.8 ± 0.6	<0.001*
Hospital Stay (days ± SD)	5.2 ± 1.0	4.5 ± 0.8	0.02*
Postoperative Infection (%)	12% (3)	4% (1)	0.28
Bleeding (%)	10% (2)	5% (1)	0.50
Urinary Retention (%)	8% (2)	4% (1)	0.50

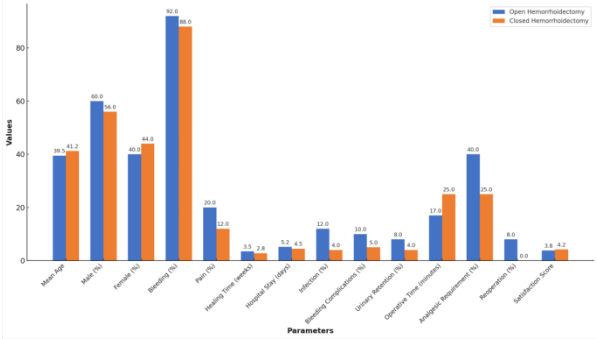
Healing was significantly faster in the closed group, averaging 2.8 weeks versus 3.5 weeks in the open group. Similarly, hospital stays were shorter for the closed group at 4.5 days, compared to 5.2 days for the open group. Postoperative infection rates were low, with 12% in the open group and 4% in the closed group. Bleeding complications occurred in 10% of the open group and 5% in the closed group. Two patients in the open group and one in the closed group reported urinary retention, which resolved with catheterisation.

Table 4: Operative Outcomes and Analgesic Requirements

Parameter	Open Hemorrhoidectomy (n=25)	Closed Hemorrhoidectomy (n=25)	p-value
Operative Time (minutes ± SD)	17 ± 2.5	25 ± 3.0	<0.001*
Analgesic Requirement (High, %)	40% (10)	25% (6)	0.03*
Reoperation for Bleeding (%)	8% (2)	0% (0)	0.14
Patient Satisfaction (Score 1-5)	3.8 ± 0.4	4.2 ± 0.3	0.01*

Operative time was significantly shorter for the open group, averaging 17 minutes compared to 25 minutes for the closed group. Analgesic requirements were higher in the open group, with 40% needing high doses compared to 25% in the closed group. Reoperation for bleeding occurred in 8% of the open group, while no reoperations were required in the closed group. Patient satisfaction scores were higher for the closed group, with an average score of 4.2 compared to 3.8 in the open group.

Figure1 : Comparison of Open and Closed Hemorrhoidectomy Outcomes



Discussion:

This study provides a comparative analysis of open (Milligan-Morgan) and closed (Ferguson) hemorrhoidectomy techniques, focusing on postoperative pain, healing time, operative duration and patient satisfaction. The findings align with existing literature, offering a comprehensive perspective on the relative advantages and considerations of each approach.

Our study showed that patients undergoing closed hemorrhoidectomy experienced lower pain levels compared to those who had the open technique, particularly in the immediate postoperative period. On Day 1, mild pain was reported by 32% of patients in the open group and 40% in the closed group. Moderate pain affected 48% in the open group and 44% in the closed group, while excruciating pain was reported by 20% and 16%, respectively. By Week 1, mild pain was reported by 32% in the open group and 36% in the closed group. Moderate pain persisted in 48% of the open group and increased slightly to 52% in the closed group, while excruciating pain decreased to 20% in the open group and 12% in the closed group. These findings are consistent with You et al., who reported significantly lower pain scores at recovery and during the first bowel movement in the closed group ($P < 0.05$ and $P < 0.01$, respectively) [7]. Bhatti et al. also demonstrated a significant reduction in postoperative pain in the closed group (SMD, −0.36; 95% CI, −0.64 to −0.07; $p = 0.01$) [8]. This reduction can be attributed to primary wound closure in the closed technique, which minimises exposure of nerve endings and reduces irritation from faecal matter, resulting in decreased nociceptive stimulation [9].

The closed technique demonstrated faster wound healing, with an average healing time of 2.8 weeks compared to 3.5 weeks in the open group ($P < 0.001$). These results align with Mohapatra et al., where 78% of patients in the closed group had fully healed wounds at three weeks, compared to only 26% in the open group [10]. Bhatti et al. also observed that the closed technique significantly accelerated wound healing (OR, 0.08; 95% CI, 0.02 to 0.24; $p < 0.0001$) [8]. Faster healing in the closed technique can be attributed to primary closure, which promotes epithelialisation and reduces inflammation, aiding tissue regeneration [11].

The open technique had a shorter operative time, averaging 17 minutes compared to 25 minutes for the closed technique ($P < 0.001$). This was supported by Ho and Buettner's meta-analysis, which showed that the open technique is quicker to perform (weighted mean difference, 1.03 minutes; $p < 0.001$) [12]. Bhatti et al. also found that the open technique had a shorter duration (SMD, 6.10; 95% CI, 3.21 to 8.98; $p < 0.0001$) [8]. The reduced time requirement in the open technique makes it advantageous in high-volume surgical centres, where operating room efficiency and patient throughput are priorities.

Patients in the closed group reported higher satisfaction scores, averaging 4.2 compared to 3.8 in the open group ($P = 0.01$). This can be attributed to reduced pain, faster healing and quicker return to normal activities. Bhatti et al. also found higher satisfaction in the closed group (SMD, 0.36; $p = 0.001$) [8]. In a study on Ferguson's closed technique, 70.5% of patients rated their outcomes as excellent, further demonstrating the long-term advantages of the closed method [13].

Both techniques showed low complication rates, with no statistically significant differences. This aligns with Majeed et al., who reported comparable rates of bleeding, infection and urinary retention between the two methods [14]. A meta-analysis involving over 1,000 patients reported complication rates of 2-5% for both techniques, with bleeding occurring in 2-3% and infection in 1-2% of cases [15,16]. In a study of 200 patients with Grade III and IV haemorrhoids, postoperative pain scores were similar, averaging 3-4 on a 10-point scale during the first week. Hospital stays were short, averaging 1-2 days and complications such as urinary retention and thrombosis occurred in about 3% of patients [10].

The choice between open and closed hemorrhoidectomy should be tailored to individual patient needs and healthcare settings. The open technique, with its shorter operative time, is more practical for high-volume centres or resource-constrained environments. However, the closed technique offers reduced postoperative pain, faster recovery and higher patient satisfaction, making it more suitable for patients prioritising a quicker return to normal life. This is particularly important in settings where postoperative follow-up may be limited.

This study has limitations, including a relatively small sample size and variability in surgical technique and postoperative care. Additionally, long-term outcomes such as recurrence rates and anal function were not assessed. Ho and Buettner noted significant heterogeneity in trials, which could impact the generalisability of results [12]. Future multicentre studies with larger sample sizes and standardised protocols are needed to validate these findings and assess long-term outcomes.

Advancements in haemorrhoid treatment are focusing on minimally invasive methods to improve patient outcomes. Laser hemorrhoidoplasty (LHP) has shown promise in reducing postoperative pain and speeding recovery. A recent meta-analysis reported that LHP patients experienced significantly less pain and returned to work earlier than those undergoing traditional surgery [17]. Another innovative approach is hemorrhoidal artery embolisation (HAE) or the "emborrhoid" technique, which occludes blood supply to haemorrhoidal tissue. Preliminary studies have reported a clinical success rate of 72% at 12 months, making it a minimally invasive alternative for haemorrhoidal disease [18].

Conclusion

Both open and closed hemorrhoidectomy techniques are effective for treating advanced hemorrhoids. The closed technique offers advantages in terms of reduced postoperative pain, faster healing and higher patient satisfaction, albeit with a longer operative time. These findings can guide surgeons in selecting the most appropriate technique based on individual patient needs and clinical settings.

References:

1. Riss S, Weiser FA, Schwameis K, et al. The prevalence of haemorrhoids in adults. Int J Colorectal Dis. 2012;27(1):123-130. doi:10.1007/s00384-011-1316-3.
2. Lohsiriwat V. Hemorrhoids: From basic pathophysiology to clinical management. World J Gastroenterol. 2012;18(17):2009-2017. doi:10.3748/wjg.v18.i17.2009.
3. .Milligan ET, Morgan CN, Jones LE, et al. Surgical anatomy of the anal canal and the operative treatment of haemorrhoids. Lancet. 1937;230(5959):1119-1124. doi:10.1016/S0140-6736(00)98567-6.
4. Ferguson JA, Heaton JR. Closed hemorrhoidectomy. Dis Colon Rectum. 1959;2(2):176-179. doi:10.1007/BF02617122.
5. .Gencosmanoglu R, Sad O, Koc D, Inceoglu R. Hemorrhoidectomy: Open or closed technique? A prospective randomized clinical trial. Dis Colon Rectum. 2002;45(1):70-75. doi:10.1007/s10350-004-6081-6.
6. .Arbman G, Krook H, Haapaniemi S. Closed vs. open hemorrhoidectomy: Is there any difference? Dis Colon Rectum. 2000;43(1):31-34. doi:10.1007/BF02237245.
7. You SY, Kim SH, Chung CS, Lee DK. Open vs closed hemorrhoidectomy. Dis Colon Rectum. 2005;48(1):108-113. doi:10.1007/s10350-004-0794-6.
8. Bhatti, M.I., Sajid, M.S. & Baig, M.K. Milligan–Morgan (Open) Versus Ferguson Haemorrhoidectomy (Closed): A Systematic Review and Meta-Analysis of Published Randomized, Controlled Trials. World J Surg 40, 1509–1519 (2016). https://doi.org/10.1007/s00268-016-3419-z
9. Cerato MM, Cerato NL, Passos P, Treigue A, Damin DC. Surgical treatment of hemorrhoids: a critical appraisal of the current options. Arq Bras Cir Dig. 2014;27(1):66-70. doi:10.1590/S0102-67202014000100016.
10. Mohapatra R, Murmu D, Mohanty A. A comparative study of open and closed hemorrhoidectomy. Int Surg J. 2018;5(6):2335-2338. doi:10.18203/2349-2902.isj20182227.
11. 11.Yeo D, Tan KY. Hemorrhoidectomy - making sense of the surgical options. World J Gastroenterol. 2014;20(45):16976-16983. doi:10.3748/wjg.v20.i45.16976.
12. Ho, Y.H., Buettner, P.G. Open compared with closed haemorrhoidectomy: meta-analysis of randomized controlled trials. Tech Coloproctol 11, 135–143 (2007). https://doi.org/10.1007/s10151-007-0343-0
13. Guenin MO, Rosenthal R, Kern B, Peterli R, von Flüe M, Ackermann C. Ferguson hemorrhoidectomy: long-term results and patient satisfaction after Ferguson's hemorrhoidectomy. Dis Colon Rectum. 2005 Aug;48(8):1523-7. doi: 10.1007/s10350-005-0084-y. PMID: 15937612.
14. 14.Majeed S, Naqvi SR, Tariq M, Ali MA. Comparison of open and closed techniques of haemorrhoidectomy in terms of post-operative complications. J Ayub Med Coll Abbottabad. 2015;27(4):791-793. PMID: 27004324.
15. Cristea C, Lewis CR. Hemorrhoidectomy. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. [Updated 2024 Feb 24]. Available from: https://www.statpearls.com.
16. Arbman G, Krook H, Haapaniemi S. Closed vs. open hemorrhoidectomy--is there any difference? Dis Colon Rectum. 2000 Jan;43(1):31-4. doi: 10.1007/BF02237240. PMID: 10813120.
17. Wee IJY, Koo CH, Seow-En I, Ng YYR, Lin W, Tan EJKW. Laser hemorrhoidoplasty versus conventional hemorrhoidectomy for grade II/III hemorrhoids: a systematic review and meta-analysis. Ann Coloproctol. 2023;39(1):3-10. doi:10.3393/ac.2022.00598.0085.
18. Falsarella PM, Nasser F, Affonso BB, Araújo SEA, Garcia RG, Katz M, et al. Embolization of the superior rectal arteries versus closed hemorrhoidectomy (Ferguson technique) in the treatment of hemorrhoidal disease: a randomized clinical trial. J VascIntervRadiol. 2023;34(5):736-744.e1. doi:10.1016/j.jvir.2023.01.022.