

Beyond the Blade: Unveiling the Pain Differences and Anal Incontinence in Open & Closed Haemorrhoidectomies in Patients with Severe Haemorrhoids (3rd and 4th Degrees)

Dr. Kenneth Onyejekwe¹; Stephen Garba^{2*} (Professor)
 Dr. Monday Yilkudi³; David-Terna Yawe (Professor)
 Dept. of Surgery, College of Health Sciences,
 University of Abuja, FCT, Nigeria

Correspondences Author:- Stephen Garba^{2*} (Professor)

Abstract:-

➤ *Background:*

Milligan-Morgan (open) and Ferguson (closed) hemorrhoidectomies are effective treatments for severe hemorrhoids, but debate lingers about post-operative complications. Studies differ on which approach leads to less pain, anal incontinence, bleeding, or healing issues. This research at University of Abuja Teaching Hospital (UATH) aimed to compare these methods of treatment of severe hemorrhoids to undertake appropriate pre-operative counselling and patient decisions.

➤ *Objective:*

To compare the severity of post-operative pain at the time of the first bowel movement and anal incontinence at the sixth week following surgery to better understand patients' experiences with open versus closed hemorrhoidectomy.

➤ *Patients and Method:*

Thirty-six (36) patients (26-72 years, both sexes) with severe hemorrhoids were randomly assigned to either open (Group A) or closed (Group B) surgery at UATH. Both groups received spinal anaesthesia. Pain was assessed using a visual scale (score 0-10) at various intervals until 6 weeks after surgery, including during the first bowel movement. Patients were trained on using the scale, with higher scores indicating worse pain. The secondary outcome of anal incontinence was measured at 6 weeks with questionnaires and clinical examination. IBM SPSS 27 was utilized for the data analysis ($p < 0.05$ for significance).

➤ *Result:*

Both the open and closed hemorrhoidectomy methods provide similar levels of pain. There was no statistically significant variation in the level of discomfort experienced during the two

hemorrhoidectomies methods. Due to the lack of a statistically significant difference, the complications associated with anal incontinence were similar in both groups.

➤ *Conclusion:*

Both open and closed hemorrhoidectomy offer manageable pain, with no statistically significant difference in pain intensity in both groups. There is no statistical difference in anal incontinence in the open and closed techniques of hemorrhoidectomy.

Keywords:- Post-Operative Pain, Haemorrhoid, Haemorrhoidectomy, Complications, Comparison.

I. INTRODUCTION

Haemorrhoids are swollen veins in the rectum, affecting up to 36% of people globally¹. In the US, it's around 4-8%, while in Nigeria, it's a major concern with half of colorectal visits related to this condition². In advanced cases (third and fourth degree), surgery like Milligan-Morgan or Ferguson hemorrhoidectomy is often needed³⁻⁵. Interestingly, in Benin Republic young men are particularly prone to this disease⁶. Open and closed hemorrhoidectomies are common but have post-operative pain, bleeding, and wound healing concerns^{7,8}. Some studies favor closed for less bleeding, and anal incontinence others find no significant difference in complications⁹⁻¹¹. Newer techniques like Transanal hemorrhoidal dearterialization (THD) offer pain-free options, but data on long-term efficacy is limited¹². Understanding the pros and cons of each method of hemorrhoidectomy is crucial for advising patients and improving surgical care.

II. THEORETICAL FRAMEWORK

The anal canal, a vital part of the digestive system measuring 3-4 centimeters, plays a crucial role in both retention and elimination¹³⁻¹⁶. Its intricate anatomy involves layered muscles, blood vessels forming cushioning pads, and transitioning epithelia. Understanding this complexity is essential for delicate procedures within, ensuring the harmonious balance of continence and elimination^{4,17-19}. Blood flow and drainage in the anal canal follow distinct routes above and below the dentate line, with lymphatic paths diverging based on location^{4,18,19}. Nerves above the line control continence and defecation, while those below provides sensation. This intricate network facilitates smooth movements and awareness^{4,4,17}.

Haemorrhoids, submucosal cushions of arterioles, venules, and smooth muscle fibers in the anal canal, have evolved in management over time^{20,21}. The term "hemorrhoid" originates from the Greek words for blood and flowing. Historical treatments date back to 1700 BC, with described in the Greek Hippocratic treatise of 460 BC⁷. The Renaissance marked a shift to a more scientific approach in haemorrhoidal excisions, with techniques introduced by Milligan and Morgan in 1937 and modified by Ferguson in 1959^{3,22}. Initially thought to be caused by vascular dilatation or erectile tissue metaplasia, haemorrhoids are now attributed to the degeneration of supportive tissues in the anal canal^{23,24}.

Anal cushions contribute to anal continence, and when symptomatic, they are termed "haemorrhoids," classified as external, internal, or internal-external. Hemorrhoid grading is based on prolapse extent, ranging from first-degree bulging to fourth-degree irreducible prolapse²⁵. External haemorrhoids are somatically innervated and sensitive, while internal haemorrhoids, covered by insensate anorectal mucosa, become symptomatic when thrombosed or necrosed, leading to bleeding or prolapse^{25,26}.

➤ *Etiology of Haemorrhoids:*

Haemorrhoids result from the degeneration of connective tissues around anal cushions, leading to weakened adhesion and prolapse. Prolonged sitting, strenuous activities, defecation straining, and age-related tissue degeneration contribute to this process. Theories like varicose veins, vascular hyperplasia, and infection lack substantial evidence^{27,28,28}.

➤ *Predisposing Factors:*

Contributing factors to haemorrhoids include a low-fiber diet, inadequate water intake causing hard stools, defecation straining, and urinary tract obstruction in men. Recent evidence questions constipation as a risk factor, suggesting diarrhea. Pregnancy-related factors, prolonged sitting, obesity, and inadequate fluid intake are also predisposing elements^{29,30}.

➤ *Treatment:*

Management depends on the degree of prolapse. Medical therapy addresses bleeding in first and second-degree haemorrhoids with dietary adjustments, fluid intake, and exercise^{1,31,32}. Symptoms of prolapse, pain, and itching are managed with improved hygiene and topical medications. Persistent bleeding may require rubber band ligation, infrared photocoagulation, or sclerotherapy. Third and fourth-degree haemorrhoids often require operative haemorrhoidectomy, employing various surgical techniques, including open (Milligan-Morgan) and closed (Ferguson) procedures^{25,30,31}.

➤ *Operative Haemorrhoidectomy:*

Operative haemorrhoidectomy, performed with different anesthesia methods, is possible in a day case, even during pregnancy. Closed haemorrhoidectomy involves excising cushions and closing the wound, while open haemorrhoidectomy allows secondary intention healing. Other techniques include Whitehead's haemorrhoidectomy and the procedure for prolapse and haemorrhoids, utilizing circular stapling^{3,3,33}.

➤ *Complications:*

Open haemorrhoidectomy presents early complications like acute urinary retention, secondary hemorrhage, infections, pain, constipation, and anal incontinence. Improvement in anal incontinence may be better in the closed group³⁴. Late complications include poor wound healing, anal fissure, recurrence, and anal stenosis. Post-operative pain is a significant concern, with various pain control modalities explored, yielding mixed results. Typically, the most significant pain occurs with the first bowel movement after haemorrhoidectomy surgery. Pain after surgery usually improves after three days and continues to improve for the next two weeks. Anal incontinence is one of the complications following haemorrhoidectomy and it is usually experienced before the six weeks after surgery^{7,8}. This study compares pain at first bowel motion and incontinence at 6th week after open and closed haemorrhoidectomies. Generally, pain is most intense at the first bowel movement. Incontinence should be evident by six weeks, when the wound is healed³⁵⁻³⁷.

➤ *Statement of the Problem*

Numerous side effects from the haemorrhoidectomy procedure include excruciating pain and anal incontinence. Usually, the initial bowel movement causes the most pain. Within six weeks, wounds heal, and by then, any incontinence should be noticeable. Knowing which methods lessen pain and incontinence in cases of severe haemorrhoids is important for both patients and surgeons.

➤ *Research Questions*

This research sets out to answer the following questions:

- Do patients with severe haemorrhoids (3rd and 4th degrees) experience significantly different levels of postoperative pain at first bowel motion depending on whether their haemorrhoidectomy was performed using an open or closed surgical technique?
- Does open type of haemorrhoidectomy result in a higher anal incontinence over the closed haemorrhoidectomy technique?

➤ *Research Hypothesis*

To answer the above questions, the following hypotheses were formulated:

- *Research Question Number 1 that says, “Do patients with severe haemorrhoids (3rd and 4th degrees) experience significantly different levels of postoperative pain at first bowel motion depending on whether their haemorrhoidectomy was performed using an open or closed surgical technique”?*

✓ **H₀**: There is no difference in the pain intensity at first bowel motion experienced by patients undergoing open or closed haemorrhoidectomy for severe haemorrhoids (3rd and 4th degrees).

✓ **H₁**: There is a difference in the pain intensity at first bowel motion experienced by patients undergoing open or closed haemorrhoidectomy for severe haemorrhoids (3rd and 4th degrees).

- *Research Question Number 2 that says, “Does open type of haemorrhoidectomy result in a higher anal incontinence over the closed haemorrhoidectomy”?*

✓ **H₀**: Open type of haemorrhoidectomy does not result in a higher complication of anal incontinence over the closed haemorrhoidectomy.

✓ **H₁**: Open type of haemorrhoidectomy results in a higher complication of anal incontinence over the closed haemorrhoidectomy.

➤ *Purpose of Study*

This study sets out to investigate the intensity of pain at first bowel motion and anal incontinence at six weeks following open and closed hemorrhoidectomies for severe haemorrhoids at University of Abuja Teaching Hospital (UATH), Gwagwalada Abuja, Nigeria.

➤ *Justification*

Knowing the profiles of pain and anal incontinence following both open (Milligan-Morgan) and closed (Ferguson) surgeries for Severe haemorrhoids will significantly impact patients' quality of life and productivity.

➤ *Significance of the Study*

In patients receiving haemorrhoidectomy for advanced haemorrhoids, this research will provide surgeons with data to advocate the haemorrhoidectomy approach with a lower pain load and less anal incontinence. It will discuss these

issues in our context and provide guidance for the best surgical management of severe haemorrhoids.

➤ *Aims and Objectives*

The **Aim** is to understand patients' experiences with open vs. closed haemorrhoidectomy for severe haemorrhoids (3rd and 4th degree) presenting to UATH, Gwagwalada by comparing the intensity of pain at first bowel motion and anal incontinence at six weeks after surgery.

• *Objectives:*

To determine the difference in the intensity of pain at first bowel motion and the rate of anal incontinence at sixth week following open (Milligan-Morgan) and closed (Ferguson) surgeries for cases of severe hemorrhoid.

➤ *Research Design*

This research is prospective in nature. Patients with the studied conditions were randomized into group A or Group B.

➤ *Description of the Study Area:*

This study was conducted in the Department of Surgery, University of Abuja Teaching Hospital, Gwagwalada, (UATH) Abuja, Nigeria. The hospital has a bed capacity of 500 and serves as a referral center for hospitals under the auspices of the Federal Capital Territory Administration and the adjoining states of Kogi, Niger, Nasarawa, Kaduna, Benue, and Plateau states.

➤ *Population of the Study*

This study enrolled all adult patients (18 years and above) who presented with third and fourth-degree haemorrhoids through the surgical outpatient clinics and emergency departments of the Department of Surgery, University of Abuja Teaching Hospital, Gwagwalada, Abuja, Nigeria, over a period of one year (August 2022 to July 2023) and who consented to participate in the study.

➤ *Sample and Sampling Procedure*

All adult patients (18 years and above) who presented with third and fourth-degree haemorrhoids through the surgical outpatient clinics and emergency departments of the Department of Surgery, University of Abuja Teaching Hospital, Gwagwalada, Abuja, Nigeria, over a period of one year (August 2022 to July 2023) and who consented to participate in the study. Patients less than 18 years, or patients with anal cancers, colorectal tumors, chronic liver disease, coagulopathies, coexisting anal fissures and fistulae, recurrent disease following previous haemorrhoidectomy, and patients with other serious comorbidities that may contraindicate surgery were excluded from the study. Eligible patients were by simple random sampling assigned to either open (Group A) or closed (Group B).

➤ *Research Protocol*

Patients were randomly assigned to Group A (open haemorrhoidectomy) or Group B (closed haemorrhoidectomy) using simple randomization with numbered papers. The procedures were performed by the

researcher, with cooperation from other senior registrars who referred eligible patients. To minimize bias, patients were taught to use the visual analogue scale independently for pain assessment. During surgery under spinal anaesthesia, the number of anal cushions was noted, and the haemorrhoid dissected out followed by ligation. All patients were catheterized, and had prophylactic antibiotics administered. The Wounds of Group A patients were left open while Group B were closed. All patients received antibiotics, analgesics and had sitz baths. The researcher conducted post-operative follow-ups, assessing pain score at the first bowel motion and for evidence of anal incontinence at sixth week of follow-up.

➤ *Research Instrument*

The research instrument used for this study was a questionnaire designed by the researcher. The proforma was used to gather information on the patients who had haemorrhoidectomy surgeries for severe haemorrhoid at UATH, Abuja.

➤ *Data Analysis*

Data collection utilized a proforma and Microsoft Excel. IBM SPSS version 27 was used to analyze categorical variables with frequencies and percentages, while continuous variables were summarized using means and standard deviations. Results were presented in tables, and line graphs. Statistical tests, including chi-square and t-tests were used to compare variables between study groups. Significance was determined at $p < 0.05$.

➤ *Financial Implication and Funding:*

The researcher funded the study without additional costs to participating patients, who only paid the standard surgical fees. Airtime was provided for communication during the study.

➤ *Limitations:*

This research is single institution based. A multicenter study across various Nigerian states with multiple researchers and participants would enhance reliability and inform best practices.

III. RESULTS

Thirty-six patients were recruited for the study between August 2022 and July 2023, in accordance with the study protocol (Table 1). Eighteen patients had Open haemorrhoidectomy while the second group of eighteen patients had Closed haemorrhoidectomy. Both groups were compared for post-operative pain score using the visual analog scale and were followed up for six weeks while assessing for pain at first bowel motion and anal incontinence at sixth week postoperative.

➤ *Socio Demographic Pattern*

Table 1 Demographic Characteristics

Variable	Frequency (n=36)	Percentage
Age (years) mean ±SD	38.31±10.14 (26-72)	
Gender		
Male	21	58.3
Female	15	41.7
Age category (years) ≤ 25		
26-35	17	47.2
36-45	13	36.2
46-55	3	8.3
≥56	3	8.3

The patient’s age ranged between twenty-six and seventy-two years. Closed haemorrhoidectomy was performed in 11 male patients (61.1%) and 7 female patients (38.9%), whereas open haemorrhoidectomy was conducted in 10 male patients (55.6%) and 8 female patients (44.4%) (Table 2).

Table 2 Demographic Characteristics Across Groups

Variables	Closed Haemorrhoidectomy n=18(%)	Open haemorrhoidectomy n=18(%)	X ² test	p-value
Age (years) mean±SD	39.83±11.98	36.78±7.62	0.913t-test	0.368
Gender				
Male	11(61.1)	10(55.6)	0.114	0.735
Female	7(38.9)	8(44.4)		
Age category (years)				
26-35	8(44.4)	9(50.0)	1.004**	1.000
36-45	6(33.3)	7(38.8)		
46-55	2(11.1)	1(5.6)		
≥56	2(11.1)	1(5.6)		

*p-value <0.05

FET = Fisher’s exact test

➤ Hypothesis Testing

The data collected for the purpose of this study was analyzed based on the research questions and hypotheses formulated.

To answer the first research question which states, “Do patients with severe haemorrhoids (3rd and 4th degrees) experience significantly different levels of postoperative pain at first bowel motion depending on whether their

haemorrhoidectomy was performed using an open or closed surgical technique?”

The hypothesis formulated to answer this question [H₀: There is no difference in the pain intensity at first bowel motion experienced by patients undergoing open or closed haemorrhoidectomy for severe haemorrhoids (3rd and 4th degrees)], was tested using Fisher’s Exact test on the data collected for this purpose (Table 3 & Figure 0-1).

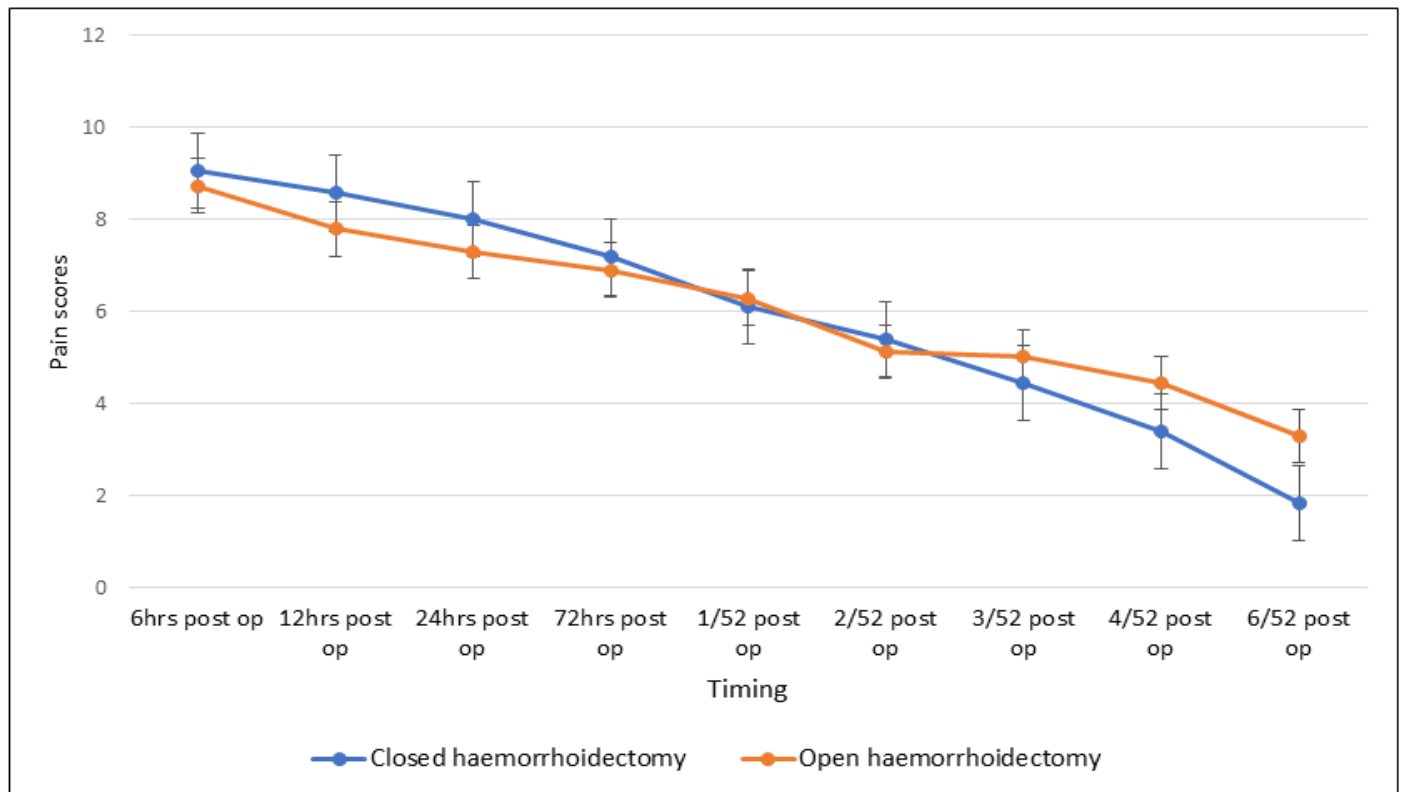


Fig 1 Line Graph Showing the Trends of Pain Scores over Time Post Operatively

Table 3 Comparison of Pain at First Bowel Motion and Anal Stenosis Across Groups

Variables	Closed Haemorrhoidectomy n=18(%)	Open haemorrhoidectomy n=18(%)	X ² test	p-value
Pain score at first bowel motion	9.11±0.832	9.44±0.62	-1.366t-test	0.181
Pain scores				
7	1(5.6)	0	2.016	0.607
8	2(11.)	1(5.6)		
9	9(50.0)	8(44.4)		
10	6(33.3)	9(50.0)		
Anal stenosis				
Yes	-	-	-	-
Nil	18(100.0)	18(100.0)		

The P value returned 0.181, implying there is no significant difference in the intensity of the postoperative pain at first bowel motion and subsequently in both groups. Therefore, the null hypothesis which says, “There is no difference in the pain intensity at first bowel motion experienced by patients undergoing open or closed haemorrhoidectomy for severe haemorrhoids (3rd and 4th degrees) is thereby accepted.

To answer the second research question, parameters were collected postoperatively for cases of anal incontinence (Table 4). The formulated hypothesis was tested using Wexner Scores across the groups to answer the question, “Does open type of haemorrhoidectomy result in a higher anal incontinence over the closed haemorrhoidectomy technique?”

Table 4 Comparison of Anal Incontinence using Wexner Score Across Groups

Wexner score	Closed Haemorrhoidectomy n=18(%)	Open haemorrhoidectomy n=18(%)	X ² test	p-value
0	18(100.0)	16(88.9)	1.985**	0.486
1	0	0		
2	0	1(5.6)		
3	0	1(5.6)		
4	0	0		

The p value is P 0.486. Therefore, the null hypothesis which says that open type of haemorrhoidectomy does not result in a higher complication of anal incontinence over the closed haemorrhoidectomy is thereby accepted. (Table:)

➤ *Summary of the Findings (Findings based on the Formulated Hypotheses Testing)*

- There is no significant difference in the intensity of pain at first bowel motion following either open or closed haemorrhoidectomies.
- The rate of anal incontinence following either Milligan-Morgan (open) and Ferguson (closed) hemorrhoidectomies are the same.

IV. DISCUSSION OF THE FINDINGS

Haemorrhoids, affecting 4-8% globally, are a major clinic concern. Though studies suggest younger individuals are most affected, this Nigerian study found an average age of 38.3 years with a male: female ratio of 1.4:1, like regional reports.

Haemorrhoids are more common in men, as shown by studies in Burkina Faso (75.7% male) and Ethiopia. This study compared pain at first bowel motion and anal incontinence at sixth week after open and closed haemorrhoidectomy. The intensity of pain at first bowel motion is the same for all categories of patients. These findings partially align with some previous studies, suggesting the optimal pain management approach may depend on the individual and the preference and skill of the surgeons. While this study found no significant difference in first bowel movement pain between open and closed haemorrhoidectomy, previous research offers mixed results. Some studies like Bhatti's suggest closed surgeries have less pain, while others like Khalil et al and Nuhu et al disagree, pointing to overall pain impacting quality of life. Factors like individual pain thresholds and anesthetic choices³⁸⁻⁴⁰ likely contribute to these discrepancies. In this study, there was no statistical difference in pain scores between the two groups. Two patients developed minor incontinence in the closed group of haemorrhoidectomies but there were no statistically significant differences between the open and closed type of haemorrhoidectomies as far as anal incontinence is concerned.

V. CONCLUSION

Within the limits of the findings of this study, the following conclusions are made: The difference in intensity of pain at the first bowel movement was not significant (p 0.181). Both groups had similar outcomes for anal incontinence. Both open and closed haemorrhoidectomy offer effective and tolerable options for treating third and fourth degree haemorrhoids. It suggests that the choice of haemorrhoidectomy technique may ultimately depend on individual preferences and surgeon expertise. Patient counseling about individual differences in post-operative experience is crucial for informed decision-making.

RECOMMENDATIONS

Based on the findings of this study, the choice of haemorrhoidectomy technique for severe haemorrhoids in our setting may ultimately depend on individual preferences and surgeon expertise. We consider both open and closed haemorrhoidectomy as viable options for third and fourth degree haemorrhoids based on individual patient needs and preferences. Surgeons should be comfortable performing both procedures and discuss with patients the pros and cons of each approach in the context of their individual case. Developing informative resources and support systems can help patients manage expectations and anxieties about post-operative recovery for both types of haemorrhoidectomies.

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