

# A prospective study of post-operative complications and its management following open hemorrhoidectomy in a tertiary care hospital



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## ABSTRACT

**Background:** Surgery is the most effective treatment for hemorrhoids and is particularly recommended for prolapsing piles during defecation that may be reduced manually (Grade III) and irreducible hemorrhoids (Grade IV). Numerous methods have been proposed for surgical therapy, and most have similar success rates. But serious post-operative complications are rarer in open technique than stapled hemorrhoidopexy. Prompt identification of post-operative complications is necessary to avoid significant patient morbidity. **Aims and Objectives:** The present study was done to access post-operative complications and their management, like post-operative pain, urinary retention, wound infection, bleeding, anal incontinence, and anal stenosis following open hemorrhoidectomy during the post-operative and follow-up periods. **Materials and Methods:** This was an observational prospective study carried out at the Department of Surgery of Midnapore Medical College and Hospital from April 1, 2021, to September 30, 2022, with 100 patients. **Results:** Out of 100 open hemorrhoidectomy cases, 74% belonged to the 31–50 year age group, 16% belonged to the 18–30 year age group, and only 10% were aged > 50 years, respectively. The mean age of our study population was 40.62. Males were predominantly higher than females (79% vs. 21%). There was 7% of patients had bleeding per rectum, 22% had urinary retention, and 4% had wound infection after open hemorrhoidectomy. Mean and standard deviation value of post-operative pain score was found in post-operative day (POD-1)  $6.15 \pm 0.85$ , POD-3-  $4.25 \pm 0.99$ , POD-7-  $2.43 \pm 1.40$ , after 28 days mean value pain score was  $0.66 \pm 1.19$ , after 84 days mean pain score was  $0.05 \pm 0.21$ . After 6 months of follow-up, there was no significant complication found. **Conclusion:** We found that the important advantages of Milligan Morgan open hemorrhoidectomy achieve in terms of pain and wound healing, hospital stay. It was less expensive and safe, easy to perform with satisfactory results and in long run it did not have significant post-operative complication.

**Key words:** Hemorrhoidectomy; Post-operative period; Complication; Management

## INTRODUCTION

Hemorrhoids are abnormal engorgement of the vascular plexus in the anal cushions lining the anal canal. As per the theory of sliding anal canal lining, weakening of supporting tissues in anal cushions leads to blood vessel descent.<sup>1</sup> In

India, over 40 million people suffer from hemorrhoids. Approximately 1 million new cases are reported annually, or 47/1000, with the incidence increasing with age. The usually affected age group is 45–65 years.<sup>2</sup> It is proposed to be caused by aging, obesity, a sedentary lifestyle, depressive mood, and pregnancy.<sup>3</sup> Patients with spinal cord injuries,

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constipation, chronic diarrhea, poor bathroom habits, post-poning bowel movements, and a poor-fiber diet are also considered to be contributing causes.<sup>4</sup> Clinically, hemorrhoids are expressed by painless, bright red bleeding from the rectum with mucous discharge, perianal irritation and pain, prolapse of the hemorrhoidal cushions, bulging masses, and soiling. Symptomatic hemorrhoids that affect the quality of life are an indication for intervention. Various non-operative treatment modalities also available include sclerotherapy, cryotherapy, rubber band ligation, infrared coagulation, and radiofrequency ablation. However, hemorrhoidectomy remains the most common procedure performed for hemorrhoids, and a minimally invasive procedure for hemorrhoids, which is basically a stapled hemorrhoidopexy, is a safer and newer modality of treatment approach performed worldwide. There are two major types of hemorrhoidectomy: Ferguson, or closed hemorrhoidectomy, and Milligan-Morgan, or open hemorrhoidectomy. The most common acute complications after hemorrhoidectomy include pain, bleeding, infection, and urinary retention. The most feared long-term complications include fecal incontinence, anal stenosis, and chronic pelvic pain. In the recent literature, a significant incidence of complications after stapled hemorrhoidopexy was reported when compared with conventional hemorrhoidectomy.<sup>5</sup> The Milligan-Morgan hemorrhoidectomy is still considered the treatment of choice since it is the most radical and has the best results.<sup>6</sup> The present study was done to assess the use of open hemorrhoidectomy in the management of third- and fourth-degree hemorrhoids and their outcomes and complications during the post-operative period and follow-up.

### Aims and objectives

To study the incidence of post-operative complications such as pain, urinary retention, wound infection, bleeding, anal incontinence, and anal stenosis following open hemorrhoidectomy in Midnapore Medical College and Hospital in the time period between April 1, 2021, and September 30, 2022, and to study the management of these complications.

## MATERIALS AND METHODS

Convenience the sample size was done. 100 patients admitted to the department of surgery at Midnapore Medical College and Hospital from April 1, 2021, to September 30, 2022, with a diagnosis of third- and fourth-degree internal hemorrhoids who underwent open hemorrhoidectomy were included in this study. Ethical approval was obtained before the study from the Institutional Review Committee of Midnapur Medical College and Hospital with memo

no. MMC/IEC-2021 dated February 18, 2021. A written informed consent was taken from all patients. A proforma was used to collect the patient's detailed clinical history, physical examination, operative details, and post-operative complication details. Patients meeting the inclusion and exclusion criteria were to be considered for this study. We excluded patients with major comorbidity, pregnancy, children, and immunocompromised state. Perioperative management includes routine laboratory tests, imaging, digital rectal examination, and proctoscopy. Patients were operated on by open/Milligan Morgan hemorrhoidectomy under spinal anesthesia.

The patient is placed in a lithotomy position after giving regional anesthesia and the buttocks are placed well beyond the edge of the table. The perianal region is painted and draped. An elliptical incision is made, and the hemorrhoid tissue is carefully dissected away from the superficial internal and external sphincter muscles to the main vascular pedicle in the anal canal, carefully avoiding any injury to the anal sphincters. The base of the pedicle is ligated, and the hemorrhoid is excised. While making the incision for the three cushions, it should be taken care of to preserve as much as possible the normal tissue bridge in between the cushions to prevent anal stenosis later on. At the end of the procedure, a nice clover leaf-shaped anal margin should be visible with intact skin bridges between the operated site. The anal canal is packed with gauze impregnated with lubricant as a hemostatic pack.

Data were collected using a proforma regarding post-operative pain, urinary retention, wound infection, bleeding, anal incontinence, and anal stenosis following open hemorrhoidectomy during the post-operative and follow-up periods. All patients were followed up at post-operative day (pod-1), pod-3, pod-7, pod-4<sup>th</sup> week, pod-12<sup>th</sup> week, and after 6 months. The patient marks on a visual analog scale the point that they feel represents their perception of pain on a scale of 0 to 10. Zero (0) indicates no pain, and ten (10) indicates very severe, excruciating pain. Mild pain: 1–2, moderate pain: 3–4, severe pain: 5–6, very severe pain: 7–8, very severe excruciating pain: 9–10.

Discharge criteria included patients oriented to time, place, and person with stable vitals who tolerated oral foods, passed urine, had adequate pain control, could ambulate, and had no wound site complaints.

## RESULTS

The data collected were tabulated and analyzed by the statistical package for social sciences software version 21.0 for Windows as well as Microsoft Excel 2010 with its inbuilt statistical analysis tool.

Age distribution among the study population is presented in Table 1. We have found that out of 100 open hemorrhoidectomy cases, 74% were in the 31–50 year age group, another 16% were in the 18–30 year age group, and only 10% were aged >50 years, respectively. The mean age of our study population was 40.62.

Males were predominantly higher than females. Male patients were 79% and female patients were 21%, respectively. The male and female ratio was 3.76:1 as shown in Table 2.

We have found it in Table 3. Grade of hemorrhoids and operated by the open method, out of 100 patients, 62% were in grade III and 38% were in grade IV.

Most of the surgeries were done in <40 min, i.e., 62% of cases. Another 38% of surgeries took 40–60 min, respectively (Table 4).

Most of the patients stool was passed in the second POD, i.e., 82 (82.0%); stool was passed in the first POD, 7%; third POD, 8%; and fourth POD, 3%, respectively. The mean POD of stool passes was 2.07. Shown in Table 5.

There was 7% of patients had bleeding per rectum, 22% had urinary retention, and 4% had a wound infection. Out of 100 cases, most of them (67% of patients) had no complications as shown in Table 6.

**Table 1: Age distribution among study population (n=100)**

Age in year	Frequency	Percentage
18–30	16	16.0
31–50	74	74.0
>50	10	10.0
Total	100	100.0
Mean and SD	40.62±8.28	

SD: Standard deviation

**Table 2: Sex distribution among study population (n=100)**

Sex	Frequency	Percentage
Male	79	79.0
Female	21	21.0
Total	100	100
M: F	3.76:1	

**Table 3: Distribution of grade of hemorrhoids (n=100)**

Grade of hemorrhoids	Frequency	Percentage
Grade III	62	62.0
Grade IV	38	38.0
Total	100	100.0

The mean and SD values of the post-operative pain score were found in POD-1  $6.15 \pm 0.85$ , POD-3  $4.25 \pm 0.99$ , and POD-7  $2.43 \pm 1.40$ . After 28 days, the mean value pain score was  $0.66 \pm 1.19$ , and after 84 days, the mean pain score was  $0.05 \pm 0.21$ . Finally, after 6 months, no pain was found in every patient as shown in Table 7.

The maximum number of fourth doses was required in 43% of cases; the mean and SD value of the analgesic required was  $3.33 \pm 1.24$  as shown in Table 8.

On the 1<sup>st</sup> day of post-operative follow-up, only urinary retention presented in 20% of cases, and another 80% of cases had no complications as shown in Table 9. Urinary retention was managed by analgesics and by convincing the patients. Few were managed by catheterization.

3<sup>rd</sup> day post-operative follow-up 2% of cases found bleeding per rectum; 2% of cases had urinary retention; only one case had a wound infection; and another 95% of cases had no complications as shown in Table 10.

On the 7<sup>th</sup> day of follow-up, we found an increase in the number of bleeds per rectum and wound infection, i.e., 7%

**Table 4: Operative time of surgeries**

Operative time of surgeries	Frequency	Percentage
<40 min	62	62.0
40–60 min	38	38.0
>60 min	0	0.0
Total	100	100.0
Mean and SD	39.19±6.62	

SD: Standard deviation

**Table 5: First bowel activity**

Bowel activity	Frequency	Percentage
First POD	7	7.0
Second POD	82	82.0
Third POD	8	8.0
Fourth POD	3	3.0
Total	100	100
Mean and SD	2.07±0.51	

POD: Post-operative day, SD: Standard deviation

**Table 6: Complications**

Complications	Frequency	Percentage
Bleeding per rectum	7	7.0
Urinary retention	22	22.0
Wound infection	4	4.0
Prolapse	0	0.0
Incontinence	0	0.0
No complications	67	67.0
Total	100	100.0

**Table 7: Post-operative pain score using (visual analog scale for pain)**

Post-operative pain score	Mean	SD
POD-1	6.15	±0.85
POD-3	4.25	±0.99
POD-7	2.43	±1.40
After 28 days	0.66	±1.19
After 84 days	0.00	±0.00
After 6 months	0.00	±0.00

POD: Post-operative day, SD: Standard deviation

**Table 8: Analgesic requirement**

Number of doses	Frequency	Percentage
First dose	11	11.0
Second doses	14	14.0
Third doses	21	21.0
Forth doses	43	43.0
Fifth doses	7	7.0
Sixth doses	4	4.0
Total	100	100
Mean and SD	3.33±1.24	

SD: Standard deviation

**Table 9: POD-1<sup>st</sup> day follow-up**

Complications	Frequency	Percentage
Bleeding per rectum	0	0.0
Urinary retention	20	20.0
Wound infection	0	0.0
Prolapse	0	0.0
Incontinence	0	0.0
No complications	80	80.0
Total	100	100.0

POD: Post-operative day

**Table 10: POD-3<sup>rd</sup> day follow-up**

Complications	Frequency	Percentage
Bleeding per rectum	2	2.0
Urinary retention	2	2.0
Wound infection	1	1.0
Prolapse	0	0.0
Incontinence	0	0.0
No complications	95	95.0
Total	100	100.0

POD: Post-operative day

and 4%, respectively. The other 89% of cases had no complications as shown in Table 11.

After 28 days, only one case had a wound infection, and another 99% of cases had no complications as shown in Table 12.

Those who came for follow-up after 84 days had no complications found, but we could not follow-up on the remaining 5 cases because they did not come for follow-up as shown in Table 13.

**Table 11: Follow-up POD-7<sup>th</sup> day**

Complications	Frequency	Percentage
Bleeding per rectum	7	7.0
Urinary retention	0	0.0
Wound infection	4	4.0
Prolapse	0	0.0
Incontinence	0	0.0
No complications	89	89.0
Total	100	100.0

POD: Post-operative day

**Table 12: Follow-up POD-28<sup>th</sup> day**

Complications	Frequency	Percentage
Bleeding per rectum	0	0.0
Urinary retention	0	0.0
Wound infection	1	1.0
Prolapse	0	0.0
Incontinence	0	0.0
No complications	99	99.0
Total	100	100.0

POD: Post-operative day

**Table 13: Follow-up POD-84<sup>th</sup> day**

Complications	Frequency	Percentage
Bleeding per rectum	0	0.0
Urinary retention	0	0.0
Wound infection	0	0.0
Prolapse	0	0.0
Incontinence	0	0.0
No complications	95	95.0
Total	95	95.0

POD: Post-operative day

After 6 months of follow-up, there were no complications found at all as shown in Table 14.

Most of the patients (63%) had discharged between 3 and 4 days; 13% had discharged >4 days; and 24% had discharged <2 days. The overall mean day of discharge was 3.26 days as shown in Table 15.

The maximum number of cases returns to normal work from POD to 2<sup>nd</sup> weeks, 3<sup>rd</sup> week, and 4<sup>th</sup> week, i.e., 14%, 42%, and 34%, respectively. And only one case each returns to normal work for POD for the 5<sup>th</sup> and 6<sup>th</sup> weeks. We could not take a history of return to normal work for the remaining 5 cases because they did not come for follow-up as shown in Table 16.

## DISCUSSION

We have found that out of 100 open hemorrhoidectomy cases, 74% were in the 31–50 year age group, another 16% were in the 18–30 year age group, and only 10% were aged >50 years, respectively. The mean age of our

**Table 14: Follow-up POD from 6 months**

Complications	Frequency	Percentage
Bleeding per rectum	0	0.0
Urinary retention	0	0.0
Wound infection	0	0.0
Prolapse	0	0.0
Incontinence	0	0.0
No complications	95	95.0
Total	95	95.0

POD: Post-operative day

**Table 15: Day of discharge**

Day of discharge	Frequency	Percentage
<2 days	24	24.0
3–4 days	63	63.0
4>	13	13.0
Total	100	100
Mean and SD	3.26±1.25	

SD: Standard deviation

**Table 16: Return to normal work**

Return to normal work	Frequency	Percentage
1 <sup>st</sup> week	3	3.0
2 <sup>nd</sup> week	14	14.0
3 <sup>rd</sup> week	42	42.0
4 <sup>th</sup> week	34	34.0
5 <sup>th</sup> week	01	1.0
6 <sup>th</sup> week	01	1.0
Record not found	05	5.0

study population was 40.62. Males were predominantly higher than females. Male patients were 79% and female patients were 21%, respectively. The male and female ratio was –3.76:1. In a similar study conducted by Kumar et al.,<sup>7</sup> their studied group had a male preponderance and a male: female ratio of 3:1. Kishore et al.,<sup>8</sup> found In terms of age distribution, hemorrhoids affect the most active age group of 20–49 years, accounting for a total of 62% of those affected in their study. Risk factors for females are similar to those of their male counterparts.

We have found it in Table 3. Grade of hemorrhoids and operated by the open method, out of 100 patients, 62% were in grade III and 38% were in grade IV. In the study of Kumar et al.,<sup>7</sup> found their studied group 73% of subjects had Grade III and 27% had Grade IV hemorrhoids.

The mean and SD values of the post-operative pain score were found in POD-1 (6.15±0.85), POD-3 (4.25±0.99), and POD-7 (2.43±1.40), after 28 days, the mean value pain score was 0.66±1.19, and after 84 days, the mean pain score was 0.05±0.21. Finally, after 6 months, no pain was found in every patient. The study by Kim and Chung<sup>9</sup> concluded that the pain score was significantly lower in the

closed group than in the open one. Carapeti et al.,<sup>10</sup> showed that there was no significant difference in the mean pain scores between the open and closed hemorrhoidectomy techniques. However, in another prospective study, Gencosmanoglu et al.,<sup>11</sup> reported that the open technique is more advantageous in that patients experience less discomfort during the early post-operative period.

Aroya et al.,<sup>12</sup> described that there is no difference between two techniques regarding post-operative bleeding. The overly enthusiastic use of intravenous fluids during the procedure may contribute to the high incidence of urinary retention. In a study carried out by Chik et al.,<sup>13</sup> the incidence of urinary retention following hemorrhoidectomy was 15.2%. In our study, 7% of patients had bleeding per rectum, 22% had urinary retention, and 4% had a wound infection.

We have found that after 28 days, only one case had a wound infection, and another 99% of cases had no complications. Those who came for follow-up after 84 days had no complications found, but we could not follow-up on the remaining 5 cases because they did not come for follow-up. Kumar et al.,<sup>7</sup> found that the overall complication rates at 1 week, 1 month, and 6 months follow-up were 25%, 12.5%, and 9.7%, respectively. The early complications we observed were bleeding and discharge in 5%, pain in 9%, and urinary retention in 11% of the study group (n=100). The reasons for urinary retention are many, but precipitating factors could be related to perioperative pain and perioperative fluid intake.<sup>14</sup>

The maximum number of cases returns to normal work from POD to 2<sup>nd</sup> weeks, 3<sup>rd</sup> week, and 4<sup>th</sup> week, i.e., 14%, 42%, and 34%, respectively. And only one case each returns to normal work for POD for the 5<sup>th</sup> and 6<sup>th</sup> weeks. After open hemorrhoidectomy, we observed the cases carefully in the post-operative period. Only a few minor complications were observed that were managed accordingly, but no major complication found after the 6-month follow-up period. Therefore, the open method was safe, and it had no significant major complications like anal incontinence or structure.

#### Limitations of the study

The limitations of this study were the small sample size and the short time period of the study. The study could be improved by increasing the duration of the study and the sample size of the study.

## CONCLUSION

Open excisional hemorrhoidectomy is considered a mainstay operation for high-grade hemorrhoids and

complicated hemorrhoids. However, post-operative pain remains a challenging problem after hemorrhoidectomy. Minor complications following surgical procedures for hemorrhoidal disease are quite common and include pain, rectal bleeding, vasovagal reaction, micturition disturbances, anal fissures, and ulcers in the anal canal. Analgesics from the NSAID group and others are used to treat it. Major complications are uncommon. Early recognition and immediate treatment of complications are crucial for a successful outcome. Future research on this topic is also being addressed for further validation.

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## REFERENCES

- Ponkiya D and Rao Y. Prevalence and the risk factors of haemorrhoids among the patients attending tertiary care hospital of Bhuj, Kutch: A cross-sectional study. *Acad J Surg.* 2020;3(1):8.
- Loder PB, Kamm MA, Nicholls RJ and Phillips RK. Haemorrhoids: Pathology, pathophysiology and aetiology. *Br J Surg.* 1994;81(7):946-954.  
<https://doi.org/10.1002/bjs.1800810707>
- Lohsiriwat V. Treatment of hemorrhoids: A coloproctologist's view. *World J Gastroenterol.* 2015;21(31):9245-9252.  
<https://doi.org/10.3748/wjg.v21.i31.9245>
- Kumar S. Prevalence of post-operative wound infection. *Asian J Med Res.* 2018;7:5-8.
- Picchio M, Greco E, Di Filippo A, Marino G, Stipa F and Spaziani E. Clinical outcome following hemorrhoid surgery: A narrative review. *Indian J Surg.* 2015;77(Suppl 3):1301-1307.  
<https://doi.org/10.1007/s12262-014-1087-5>
- Medina-Gallardo A, Curbelo-Peña Y, De Castro X, Roura-Poch P, Roca-Closa J and De Caralt-Mestres E. Is the severe pain after Milligan-Morgan hemorrhoidectomy still currently remaining a major postoperative problem despite being one of the oldest surgical techniques described? A case series of 117 consecutive patients. *Int J Surg Case Rep.* 2017;30:73-75.  
<https://doi.org/10.1016/j.ijscr.2016.11.018>
- Kumar N, Narang B, Singh RS, Singh SP, Shankar CM, Singh SP. Assessment of post-operative complications, recurrence rate, and patient satisfaction after undergoing stapled hemorrhoidopexy intervention for grades III and IV hemorrhoids among adult patients of North India. *Int J Sci Stud.* 2020;8(4):103-107.
- Kishore PK, Srithi BM and Obulesu G. Comparative study between stapler and open hemorrhoidectomy in the management of grade III/IV hemorrhoids. *Int Arch Integr Med.* 2016;3(9):218-221.
- Kim SH and Chung CS. Open vs. Closed hemorrhoidectomy. *Dis Colon Rectum.* 2005;48(1):108-113.  
<https://doi.org/10.1007/s10350-004-0794-6>
- Carapeti EA, Kamm MA, McDonald PJ and Phillips RK. Double-blind randomised controlled trial of effect of metronidazole on pain after day-case haemorrhoidectomy. *Lancet.* 1998;351(9097):169-172.  
[https://doi.org/10.1016/S0140-6736\(97\)09003-X](https://doi.org/10.1016/S0140-6736(97)09003-X)
- Gencosmanoglu R, Sad O, Koc D and Inceoglu R. Hemorrhoidectomy: Open or closed technique? A prospective, randomized clinical trial. *Dis Colon Rectum.* 2002;45(1):70-75.  
<https://doi.org/10.1007/s10350-004-6116-1>
- Aroya A, Perez F, Miranda E, Serrano P, Candela F, Lacueva J, et al. Open versus closed day-case haemorrhoidectomy: Is there any difference? Results of a prospective randomised study. *Int J Colorectal Dis.* 2004;19(4):370-373.  
<https://doi.org/10.1007/s00384-003-0573-1>
- Chik B, Law WL and Choi HK. Urinary retention after haemorrhoidectomy: Impact of stapled haemorrhoidectomy. *Asian J Surg.* 2006;29(4):233-237.  
[https://doi.org/10.1016/S1015-9584\(09\)60094-4](https://doi.org/10.1016/S1015-9584(09)60094-4)
- Ravo B, Amato A, Bianco V, Boccasanta P, Bottini C, Carriero A, et al. Complications after stapled hemorrhoidectomy: Can they be prevented? *Tech Coloproctol.* 2002;6(2):83-88.  
<https://doi.org/10.1007/s101510200018>

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**AB**- Concept, design, clinical protocol, manuscript preparation, data collection and analysis, manuscript preparation, treating surgeon; **DD**- Concept and design, Manuscript editing, treating surgeon and review; **NL**-Literature survey, coordination and manuscript revision, treating surgeon; **SD**- Manuscript review, statistical analysis and interpretation; treating surgeon.

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