

A Prospective Comparative Randomized Study of Post-Operative Outcomes in Patients with Second and Third Degree Internal Hemorrhoids Managed with Suture Hemorrhoidopexy Versus Open Milligan-Morgan Hemorrhoidectomy

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Abstract

Background: Hemorrhoidal disease is a common benign anorectal condition frequently requiring surgical intervention in patients with second- and third-degree internal hemorrhoids. Although open Milligan–Morgan hemorrhoidectomy remains the conventional standard, it is associated with significant postoperative pain and delayed recovery. Suture Hemorrhoidopexy has emerged as a minimally invasive alternative aimed at reducing postoperative morbidity. The objective is to compare postoperative pain, recovery parameters, complications, and recurrence between suture Hemorrhoidopexy and open Milligan–Morgan Hemorrhoidectomy in patients with second- and third-degree internal hemorrhoids. **Material and Methods:** This prospective, comparative, randomized study was conducted at a tertiary care center in Ahmedabad from June 2022 to June 2025, following Institutional Ethics Committee approval. A total of 46 patients were randomized into two groups: suture Hemorrhoidopexy (n = 23) and open Milligan–Morgan Hemorrhoidectomy (n = 23). Postoperative pain was assessed using the Visual Analogue Scale (VAS). Other outcome measures included hospital stay duration, time to return to normal activities, postoperative complications, recurrence, and patient satisfaction. Proper tests were used for the statistical analysis, and $p < 0.05$ was considered significant. **Results:** Patients undergoing suture Hemorrhoidopexy experienced significantly lower postoperative pain at 24 hours (3.1 ± 0.9 vs 6.4 ± 1.1) and 72 hours (1.8 ± 0.7 vs 4.3 ± 1.0) compared to the Milligan–Morgan group ($p < 0.001$). The average length of stay (1.9 ± 0.6 vs 3.6 ± 1.1 days) and the duration of time to normal activity (6.2 ± 1.8 vs 13.4 ± 3.6 days) were also significantly less in the suture Hemorrhoidopexy group. Postoperative complications were fewer, and patient satisfaction was higher with suture Hemorrhoidopexy, while recurrence rates were comparable between the two procedures. **Conclusion:** Suture hemorrhoidopexy is a safe and effective alternative to open Milligan-Morgan hemorrhoidectomy of the second- and third-degree internal hemorrhoid, which will result in less pain after surgery, quicker wound healing, and lower initial complication rates compared to open Milligan-Morgan hemorrhoidectomy with similar recurrence rates.

Keywords: Internal haemorrhoids, Second-degree haemorrhoids, Third-degree haemorrhoids, Suture hemorrhoidopexy, Milligan–Morgan hemorrhoidectomy, Post-operative outcomes, Randomized comparative study, Post-operative pain, Surgical management of haemorrhoids, Complications and recovery.

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INTRODUCTION

Hemorrhoidal disease is considered among the most common benign anorectal disorders on the globe. It is among the main causes of morbidity in terms of the quality of life and work output. Epidemiological research estimates that at any particular time, 4-5 percent of the adult human population has symptomatic hemorrhoids, and almost half of them experience some symptoms of hemorrhoids at least once in their lives.^[1,2] Adults between the ages of 40 and 65 years are more commonly affected by the condition, with lifestyle choices of low dietary fiber consumption, chronic constipation, long sitting, and obesity, as well as sedentary habits contributing significantly to the etiology.^[3] Hemorrhoidal disease accounts for a significant proportion of general outpatient visits for surgery in India. According to

hospital-based Indian studies, hemorrhoids have been diagnosed in 25-40% of all cases of proctology consultations, where internal hemorrhoids are the most prevalent subtype of hemorrhoids.^[4,5]

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Rapid urbanization, transition of diet to low-fiber foods, the growing rates of obesity, and decreased physical activity have been cited as the causes of the increase in the prevalence of hemorrhoidal disease in India.^[6] It has been documented in literature in tertiary care units in western India that cases of 2nd and 3rd degree internal hemorrhoids constitute the most frequent instances that require surgical correction, especially in middle-aged males.^[7]

Prolapse grade is used to grade internal hemorrhoids. Second-degree hemorrhoids protrude during the act of defecation but spontaneously subside; those of the third degree hemorrhoids must be reduced manually. Such grades are frequently resistant to traditional interventions such as diet, stool softeners, and in-office interventions and require definitive surgery.^[8] The optimal intervention must be able to reduce symptom control and postoperative pain, complications, hospitalization, and recidivism.

An operation known as the open Milligan-Morgan hemorrhoidectomy, which was first described in 1937, was constructed long ago as the gold standard in the management of advanced internal hemorrhoids.^[9] Although this surgery has great long-term curative rates, postoperative morbidity is high. Therefore, this operation is characterized by acute pain, urinary retention, slower wound recovery, secondary hemorrhage, and anal stenosis, which causes delayed recovery and normal activity.^[10,11] These negatives have prompted the quest for less invasive, tissue-sparing options. A non-excisional procedure is suture hemorrhoidopexy, which is premised on ligation of the hemorrhoidal cushions above the dentate line to reduce arterial inflow and restore prolapsed tissue without leaving open wounds. This procedure has been linked with less postoperative pain, shorter operating time, shorter recovery duration, and a timely return to employment by maintaining anoderm and mucosa.^[12,13] Indian studies comparing the results of suture hemorrhoidopexy have shown promising results, especially in cases of second- and selective-degree hemorrhoids, with better postoperative pain ratings and satisfactory recurrence rates relative to the traditional hemorrhoidectomy.^[14]

Information in western India, including Gujarat, is still scarce and developing. In a hospital-based study in Ahmedabad, hemorrhoidal disease was found to account for almost 30 percent of anorectal surgical admissions, with second and third-degree hemorrhoids being the most common reasons to have surgery.^[15] The other comparative study conducted in Gujarat found that minimally invasive hemorrhoidal surgeries resulted in a much shorter hospital stay and required less analgesics than open hemorrhoidectomy, demonstrating the need for region-specific evidence.^[16]

Although the technique of suture hemorrhoidopexy is increasingly popular, it has been controversially compared to open Milligan-Morgan hemorrhoidectomy of the third-degree structures in terms of its long-term effectiveness, re-injury rates, and complication rates. Moreover, prospective randomized comparative studies from India, and especially from Gujarat, are scarce, limiting the generalizability of available international data to the Indian population.

Thus, a prospective, comparative, randomized trial was conducted at one of the tertiary care units in Ahmedabad,

Gujarat, to compare postoperative outcomes of suture hemorrhoidopexy and open Milligan-Morgan hemorrhoidectomy in patients with second- and third-degree internal hemorrhoids. The research will produce very strong, location-specific evidence to help inform decision-making during surgeries and enhance patient-centered outcomes in hemorrhoidal disease management.

Aims, Objectives, and Future Outcomes

This prospective comparative randomized study is primarily designed to compare the outcomes of the interventions in the postoperative period of suture Hemorrhoidopexy versus open Milligan-Morgan Hemorrhoidectomies among patients with second and third-degree internal hemorrhoids. The research aims to evaluate the safety and efficacy of the two study forms regarding postoperative pain, early and late complications, hospital stay, time to regain normal activities, and the risk of symptom recurrence. Also, the research will be used to compare patient satisfaction and general functional recovery after both operations.

The proposed study is expected to provide evidence-based guidance on the selection of the most suitable surgical method for the management of second- and third-degree internal hemorrhoids in routine practice. The study can help achieve better patient-centered care, more efficient use of resources, and reduced healthcare burden by identifying procedures associated with improved patient recovery and reduced morbidity. The results can also be used to devise institutional guidelines as well as promote the use of less invasive procedures in cases where they are suitable, which will ultimately improve the patient's surgical outcomes and quality of life in terms of hemorrhoidal disease.

MATERIALS AND METHODS

The proposed comparative randomized study was carried out at GCS Medical College Hospital and Research Centre, Ahmedabad, spanning three years from 1 st June 2022 to 1 st June 2025. The study was undertaken after obtaining approval from the Institutional Ethics Committee, GCS Medical College, vide approval number GCSMC/EC/Research project APPROVE/2022/351 dated 16/05/2022. Written informed consent was obtained from all participants before enrollment, and the study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

A total sample size of 46 patients diagnosed with second- and third-degree internal hemorrhoids was included in the study. The patients were randomly allocated into two equal groups of 23 patients each using a computer-generated randomization method. Group A consisted of patients who underwent suture hemorrhoidopexy, while Group B included patients managed with open Milligan-Morgan Hemorrhoidectomy.

Adult patients aged 18 years and above with clinically and proctoscopically confirmed second- or third-degree internal hemorrhoids and deemed fit for surgery were included. Patients with deeply seated anorectal conditions such as Fissure-in-Ano, Fistula, Abscess, Inflammatory Bowel Disease, Colorectal Malignancy, Bleeding Disorders, Pregnancy, or who were unfit to undergo Anesthesia were excluded. Patients who did not wish to provide informed consent were also excluded from the study.

All surgical operations were performed by experienced general surgeons using a standardized anesthesia protocol. To reduce procedural bias, uniform perioperative care was provided in both groups, including bowel preparation, antibiotic prophylaxis, analgesic regimen, and postoperative care. Postoperative pain was assessed using the Visual Analogue Scale (VAS) at fixed intervals. Other outcome measures were intraoperative and postoperative complications, hospital stay, normal daily activities, and recurrence of hemorrhoidal symptoms during the follow-up. The outpatient department followed the patients at specified time intervals to assess wound healing, symptom resolution, and complications. The data were then documented into a predesigned pro forma and put into Microsoft Excel. The statistical analysis was conducted using appropriate statistical software. The mean and standard deviation were used to demonstrate continuous variables, whereas frequencies and percentages were used to illustrate categorical variables. Student's t-test for continuous variables and the Chi-square test for categorical variables were applied in a comparative analysis of the two groups. A p-value that was below 0.05 was regarded as significant.

RESULTS

The study was done on 46 patients with second- and third-degree internal hemorrhoids; 23 patients were used in each group. The age of the patients under suture hemorrhoidopexy procedure was 41.3659.6 years, and in the case of Milligan-Morgan hemorrhoidectomy, it was 42.74.2 years. Male patients dominated both groups, with a male-to-female ratio of 15:8 in the suture hemorrhoidopexy group and 14:9 in the Milligan-Morgan group. In the suture hemorrhoidopexy group, 47.8% and 43.5% of patients had second- and third-degree hemorrhoids, respectively; in the open hemorrhoidectomy group, 52.2% and 56.5%, respectively. The two groups did not differ in the mean duration of symptoms before surgery (14.2 ± 5.1 months vs 15.1 ± 6.0

months). The most frequent presenting symptom was Bleeding Per rectum, reported by 78.3% of patients in the suture hemorrhoidopexy group and 82.6% in the Milligan-Morgan group. It was followed by prolapse during defecation (60.9% and 65.2, respectively).

The evaluation of postoperative pain showed that lower scores in pain levels were registered in patients who received suture hemorrhoidopexy. The mean of the Visual Analogue Scale (VAS) Pain at 24 hours in the suture hemorrhoidopexy group was 3.1 ± 0.9 , and the Milligan-Morgan hemorrhoidectomy group was 6.4 ± 1.1 . At 72 hours, the average VAS score further deteriorated to 1.8 ± 0.7 in the suture hemorrhoidopexy group, whereas patients who had undergone open hemorrhoidectomy still had high VAS scores (4.3 ± 1.0). These variations were statistically significant, indicating better postoperative pain control with suture hemorrhoidopexy.

The average length of stay in the hospital was found to be considerably shorter for suture hemorrhoidopexy (1.9 ± 0.6 days) than for Milligan-Morgan hemorrhoidectomy (3.6 ± 1.1 days). On the same note, the patients in the suture hemorrhoidopexy group were able to resume their normal daily lives much earlier, with a mean and standard deviation of recovery days at 6.2 and 13.4, respectively, in the suture and open hemorrhoidectomy groups. There were also reduced requirements for other postoperative analgesics in the suture hemorrhoidopexy group, where only 6 patients (26.1%) needed additional analgesics, compared with 17 patients (73.9%) in the Milligan-Morgan group.

In the group of 3 patients with suture hemorrhoidopexy, it was observed that 3 patients (13.0%) suffered complications early in the postoperative period, and 9 patients (39.1) with Milligan-Morgan hemorrhoidectomy had complications due to bleeding, retention, or wound problems. Comprehensively, the results show suture hemorrhoidopexy to be superior to open Milligan-Morgan hemorrhoidectomy with respect to postoperative pain, shorter hospital stay, quicker recuperation, and early complications in patients with second and third-degree internal hemorrhoids.

Table 1: Comparison of Baseline Clinical Characteristics of Study Participants (n = 46)
(Objective: To ensure comparability of both groups at baseline)

Variable	Suture Hemorrhoidopexy (n = 23)	Milligan-Morgan Hemorrhoidectomy (n = 23)	p-value
Mean age (years)	41.3 ± 9.6	42.7 ± 10.2	0.64
Male : Female	15 : 8	14 : 9	0.76
Second-degree haemorrhoids	11 (47.8%)	10 (43.5%)	0.78
Third-degree haemorrhoids	12 (52.2%)	13 (56.5%)	0.78
Mean duration of symptoms (months)	14.2 ± 5.1	15.1 ± 6.0	0.59
Presenting complaint – bleeding	18 (78.3%)	19 (82.6%)	0.72
Presenting complaint – prolapsed	14 (60.9%)	15 (65.2%)	0.76

Interpretation: The two groups were similar with respect to age, gender, hemorrhoid grade, and symptom profile, indicating adequate randomization.

Table 2: Comparison of Postoperative Outcomes Between the Two Surgical Techniques
(Primary Objective: To compare postoperative pain, recovery, and hospital stay)

Outcome Parameter	Suture Hemorrhoidopexy (n = 23)	Milligan-Morgan Hemorrhoidectomy (n = 23)	p-value
Mean VAS pain score (24 hours)	3.1 ± 0.9	6.4 ± 1.1	<0.001
Mean VAS pain score (72 hours)	1.8 ± 0.7	4.3 ± 1.0	<0.001
Mean hospital stay (days)	1.9 ± 0.6	3.6 ± 1.1	<0.001
Time to return to normal activity (days)	6.2 ± 1.8	13.4 ± 3.6	<0.001
Requirement of additional analgesics	6 (26.1%)	17 (73.9%)	0.001

Interpretation: Patients with suture hemorrhoidopexy were found to have much less postoperative pain, reduced hospital stay, and rapid recovery to a regular lifestyle as compared to those who had open hemorrhoidectomy.

Table 3. Comparison of Postoperative Complications and Recurrence (Secondary Objective: To assess safety, complications, and recurrence)

Complication / Outcome	Suture Hemorrhoidopexy (n = 23)	Milligan–Morgan Hemorrhoidectomy (n = 23)	p-value
Postoperative bleeding	1 (4.3%)	4 (17.4%)	0.16
Urinary retention	2 (8.7%)	6 (26.1%)	0.12
Wound infection	0 (0%)	3 (13.0%)	0.07
Anal stenosis	0 (0%)	2 (8.7%)	0.15
Recurrence at 6 months	2 (8.7%)	1 (4.3%)	0.55
Overall patient satisfaction	21 (91.3%)	15 (65.2%)	0.03

Interpretation: Its recurrence rates were similar between the two procedures, but suture hemorrhoidopexy also had less wound-related complication and greater satisfaction by the patient.

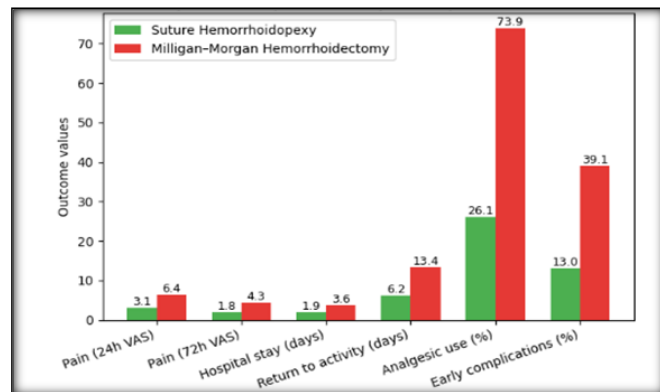


Figure 1: Multiple Bar graph showing Comparison of Major Post-Operative Outcomes

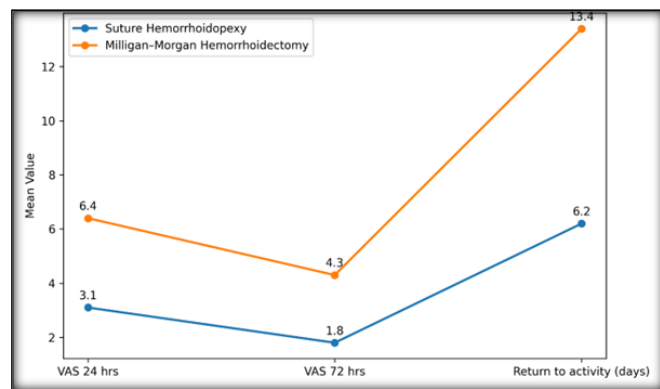


Figure 2: Comparison of Post-Operative Pain and Recovery Parameters

Comparative line graph depicting scores of postoperative pain at 24 and 72 hours and duration of recovery of normal activity following suture hemorrhoidopexy procedure and open Milligan-Morgan hemorrhoidectomy. Suture hemorrhoidopexy had higher pain scores and a more rapid recovery.

DISCUSSION

Suture hemorrhoidopexy, as observed in the current research, has definite benefits over open Milligan-Morgan hemorrhoidectomy in terms of the rate of return to normal life in the postoperative period, the length of hospitalization,

and the rate of recovery. Patients who underwent suture hemorrhoidopexy had significantly lower mean VAS pain scores at 24 hours (3.1 ± 0.9) and 72 hours (1.8 ± 0.7) than those receiving the Milligan-Morgan hemorrhoidectomy (6.4 ± 1.1 and 4.3 ± 1.0 , respectively). These results are in line with earlier research comparing minimally invasive hemorrhoidal surgeries, which show less pain in the post-surgical period when the anoderm is preserved, and wide excision wounds are avoided. The same was observed by Shalaby et al., who showed a significantly lower early postoperative pain rating in non-excisional compared to the conventional hemorrhoidectomy practice involving hemorrhoidectomy in both studies.^[17] Similarly, Giordano et al. stated that the tissue-sparing surgeries were also related to a better quality of early postoperative pain as compared to the Milligan-Morgan hemorrhoidectomy.^[18]

The observed better hospital stays and quicker recovery with the suture hemorrhoidopexy approach provide further support for the advantages of less invasive surgical procedures. The average hospital stay in the current study was 1.9 and 0.6 days for suture hemorrhoidopexy and open hemorrhoidectomies, respectively, with a much earlier return to normal activities (6.2 and 13.4 days, respectively). Burch et al. and Jayaraman et al. reported similar trends. They indicated a much lower hospital stay and a quicker rebound of daily activity in patients undergoing non-excisional or mucosal lifting procedures than in those with conventional hemorrhoidectomy.^[19,20] Another report gave a suture-based procedure for hemorrhoids with a lower morbidity and shorter convalescence of patients, which was an Indian study by Patel et al, providing support to the applicability of findings in the Indian population.^[21]

Postoperative complications were less frequent in the suture hemorrhoidopexy group (13.0%) compared to the Milligan–Morgan group (39.1%) in the present study. Although complications such as bleeding and urinary retention were observed in both groups, they were more common following open hemorrhoidectomy. These findings are in agreement with reports by Nienhuijs et al. and Shao et al., who documented higher rates of wound-related complications and urinary retention following excisional hemorrhoidectomy due to larger raw areas and greater postoperative pain.^[22,23] The reduced tissue trauma associated with suture hemorrhoidopexy likely explains the lower complication rates observed.

Recurrence rates were low and comparable between the two techniques in the present study, suggesting that suture

hemorrhoidopexy provides adequate long-term symptom control in patients with second- and third-degree hemorrhoids. Similar recurrence rates have been reported in systematic reviews comparing conventional hemorrhoidectomy with newer tissue-sparing techniques, where recurrence was not significantly different despite improved postoperative recovery profiles.^[24] In a recent meta-analysis by Emile et al., the results of the current study were also found to be consistent with enhanced short-term outcomes and comparable efficacy of minimally invasive hemorrhoidal surgery.^[25]

Comprehensively, the current research contributes to the existing evidence that indicates that suture hemorrhoidopexy is an effective and safe alternative to open Milligan-Morgan hemorrhoidectomy, especially when the patient has a second and third-degree internal hemorrhoid. The decreasing postoperative pain, accelerating recovery, and decreased complication rates in this study respond favorably to the literature in the international and Indian community, which indicates the possibility of the use of suture hemorrhoidopexy as a surgical alternative in appropriate patients.

Table 4: Comparison of Outcomes Between Suture Hemorrhoidopexy and Milligan–Morgan Hemorrhoidectomy Across Studies

Outcome Parameter	This Study	Shalaby et al. ^[17]	Giordano et al. ^[18]	Burch et al. ^[19] / Jayaraman et al. ^[20]	Patel et al. (India). ^[21]	Emile et al. (Meta-analysis). ^[25]
Postoperative pain (VAS 24 h)	SH: 3.1 ± 0.9 MM: 6.4 ± 1.1	Significantly lower pain with non-excisional techniques	Lower early pain with tissue-sparing procedure	—	Reduced pain in suture-based techniques	Significantly lower early pain
Postoperative pain (VAS 72 h)	SH: 1.8 ± 0.7 MM: 4.3 ± 1.0	Sustained pain reduction	Better early comfort	—	Lower pain scores	Sustained short-term benefit
Hospital stay (days)	SH: 1.9 ± 0.6 MM: 3.6 ± 1.1	Shorter stay	Shorter stay	Reduced hospital stay	Shorter stay in Indian cohort	Significantly reduced
Return to normal activity (days)	SH: 6.2 ± 1.8 MM: 13.4 ± 3.6	Earlier recovery	Faster return to activity	Earlier resumption of daily activity	Faster recovery	Faster functional recovery
Overall complications (%)	SH: 13.0% MM: 39.1%	Lower complication rate	Fewer wound-related complications	—	Reduced postoperative morbidity	Lower early complication rates
Bleeding & urinary retention	Less frequent with SH	Less frequent	Reduced incidence	—	Reduced	Reduced
Recurrence rate	Low & comparable	Comparable	Comparable	Comparable	Comparable	No significant difference

CONCLUSION

The current prospective comparative randomized trial shows that suture hemorrhoidopexy is an acceptable and effective use of the open Milligan-Morgan hemorrhoidectomy in the treatment of second and third-degree internal hemorrhoids. Suture hemorrhoidopexy patients had such low postoperative pain, hospital stay, and resumption of usual activities, and also early postoperative complications were reduced as compared to patients who underwent open hemorrhoidectomy. The two procedures demonstrated similar effectiveness in symptom management, with no significant difference in recurrence rates, even at follow-up. These results indicate that suture hemorrhoidopexy has better short-term postoperative outcomes with equal efficacy; hence, it should be considered a good surgical option for selected patients.

Limitations

The study has both strengths and weaknesses. The sample size was also small, comprising 46 patients, which could limit the external validity of the results. The research was conducted at a single tertiary care facility, and the results could not be linked to the surgical team's experience or institutional practice. Also, the number of years of follow-up was relatively small, and no estimation was possible of the occurrence and late complications in the long term. Functional outcomes were not measured using validated scoring systems; therefore, this may have provided a better

perspective on the patients' genuine quality of life.

Recommendations

According to the results of this research, it is possible to recommend suture hemorrhoidopexy as a first choice of surgical intervention in patients with internal hemorrhoids, 2nd and 3rd degrees, as it has positive postoperative outcomes. To further confirm these findings, longer, multicenter follow-up studies on a larger scale are advised. Standardized quality-of-life assessment instruments and cost-effectiveness analyses should also be included in future research to inform clinical decision-making better. Proper training and standardization of the suture hemorrhoidopexy technique are necessary to achieve the best results and achieve wider implementation in daily surgical practice.

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Conflicts of interest

There are no conflicts of interest.

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