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Evaluation of Postoperative Pain Management Strategies in Hemorrhoidectomy in a Tertiary Care Teaching Hospital

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Abstract:

- ***Background:***

Effective postoperative pain management is crucial for optimal recovery following hemorrhoidectomy. This study evaluates and compares two postoperative pain management strategies.

- **Traditional opioid-based therapy**
- **Multimodal analgesia**

In patients undergoing hemorrhoidectomy at a tertiary care teaching hospital.

- ***Methods:***

A total of patients were categorized into two primary groups:

- **Group A (Traditional Opioid-Based Therapy) received tramadol and oral acetaminophen;**
- **Group B (Multimodal Analgesia) received oral acetaminophen, Topical lidocaine, and Sitz Bath.**

Patient demographics, surgical type, and additional clinical parameters including VAS pain Scores on postoperative Days 1, 3, and 5, satisfaction scores, recovery duration, and Contributing lifestyle and medical history factors were recorded and analyzed.

- ***Results:***

Preliminary findings indicated that 60% of patients in Group A experienced significant pain Reduction, compared to 40% in Group B. Group A also showed comparatively shorter Recovery times and higher satisfaction scores. Associated factors such as low fiber intake, Sedentary lifestyle, history of constipation, and comorbidities like diabetes and Hypertension were examined for their influence on recovery outcomes.

- ***Conclusion:***

Traditional opioid-based therapy was found to be more effective in reducing postoperative Pain and improving patient satisfaction in the immediate postoperative period following Hemorrhoidectomy. These findings support the continued use of opioids in selected cases, With due consideration of patient-specific factors and potential adverse effects.

Keywords: *Hemorrhoidectomy, Tramadol, Lidocaine, Acetaminophen, Traditional Opioid Based Therapy, Multimodal Analgesia, Sitz Bath, VAS Pain Score.*

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I. INTRODUCTION

Hemorrhoids are vascular cushions in the anal canal that become symptomatic when swollen or inflamed, affecting ~5% of adults (1). While Grade I-II hemorrhoids often respond to conservative management, Grade III-IV typically require surgical intervention, with hemorrhoidectomy remaining the gold standard despite significant postoperative pain (2). Post-hemorrhoidectomy pain management remains a significant clinical challenge. The anorectal region's dense sensory innervation makes it particularly susceptible to postoperative pain (1). Clinical studies demonstrate that over 70% of patients report severe pain (VAS ≥7) within the first 24 hours after surgery. This pain peaks during the first bowel movement, creating a cycle of discomfort and anxiety (3). Inadequate pain control prolongs hospital stays by an average of 1.5 days compared to optimized regimens (1). Furthermore, poor pain management reduces patient satisfaction scores by 40% in retrospective analyses (4). Opioid analgesics, while effective for pain relief, carry substantial risks. Their use triples the likelihood of urinary retention based on multivariate analysis (OR 3.1, 95% CI 1.8-5.4) (4). Opioids also exacerbate constipation, which can worsen surgical site trauma during defecation (1). Recent research highlights superior outcomes with multimodal approaches. A randomized trial found combined topical lidocaine and oral NSAIDs reduced pain scores by 42% compared to opioid-only regimens (5). Another study demonstrated that topical 10% metronidazole specifically decreases defecation pain by 35% (6). Similar benefits were observed with metronidazole cream in a placebo-controlled trial (9). Additionally, pudendal nerve blocks improved patient satisfaction rates in 78% of cases. Despite this evidence, protocol standardization remains lacking. A Prospect collaboration review found only 28% of institutions follow consistent pain management guidelines (2). Another study noted similar variability in clinical practice patterns (10).

This study aims to Evaluate the postoperative pain management strategies in hemorrhoidectomy. Furthermore, this study provides information, Comparative effectiveness of different analgesic approaches. Optimal dosing and monitoring protocols- to minimize side effects. Patient-centered outcomes- including pain relief, functional recovery, and satisfaction.

➢ *Aim*

This study aims to evaluate and compare the effectiveness of postoperative pain management strategies in hemorrhoidectomy patients in a tertiary care teaching hospital.

➢ *Objectives*

- To evaluate the intensity of postoperative pain in patients undergoing hemorrhoidectomy using the Visual Analog Scale (VAS).
- To assess the effectiveness of different pain management strategies.
- To compare pain levels at various postoperative time intervals (Day 1, Day 3, Day 7).
- To identify the most commonly used and well-tolerated analgesic regimen in the postoperative period**.**

II. METHODOLOGY

➢ *Study Site:*

This study was conducted in inpatient ward, The Department of Surgery, Government Cuddalore Medical College and Hospital Cuddalore (GMCHC), Chidambaram, Tamilnadu.

➢ *Study Design:*

A prospective observational study.

➢ *Study Period:*

The study was conducted over a period of 4 months (January 2025 – April 2025).

➢ *Study Tools:*

PROFORMA (Data Collection Form)

➢ *Inclusion Criteria:*

- Patients aged 18 years and above undergoing open or closed hemorrhoidectomy procedures.
- Patients diagnosed with Grade III or Grade IV hemorrhoids, indicated for surgical intervention.
- Patients who have undergone elective hemorrhoidectomy in the tertiary care teaching hospital.
- Patients who are available for postoperative follow-up for at least 7 days.
- Patients who are conscious and oriented postoperatively and can communicate pain levels effectively (e.g., using VAS).

➢ *Exclusion Criteria:*

- Patients below 18 years of age.
- Patients with coexisting anorectal disorders (e.g., fissure, fistula, abscess).
- Patients with psychiatric or cognitive impairment affecting pain assessment.
- Patients on chronic opioid therapy or long-term analgesics for other conditions.

➢ *Sample Size Determination:*

$$\text{Sample size, } n = \frac{2(Z\alpha/2+Z\beta)2}{D2}$$

By using this formula,

$$N = \frac{2(1.96+0.84)2}{(0.5)2}$$

$$N = \frac{2(2.8)2}{0.25}$$

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$$N = \frac{15.68}{0.25}$$

N = 62

➢ *A Total Sample Size of 62 Patients has been Selected, with 31 Patients in Each Group:*

- Total sample 62 patients (31 per group), accounting for:
- Comparison of two strategies (multimodal vs. opioid-based)

➢ *Study Procedure:*

- *Patient Recruitment:*

Consecutive patients undergoing elective hemorrhoidectomy (Grade III-IV) at Government Medical College and Hospital Cuddalore (Chidambaram) between January and March 2025 were screened for eligibility based on predefined inclusion/exclusion criteria. A total of 60 eligible patients were randomly assigned into two groups:

✓ Group A (Traditional Opioid-Based): Received standard opioids (Inj. tramadol + oral acetaminophen).
✓ Group B (Multimodal Analgesia): Received a combination (oral acetaminophen + topical lidocaine + Sitz bath [if required]).

➢ *Source of Data:*

- Patient Medical records
- Direct Clinical Examination
- Laboratory Reports
- Treatment Monitoring Sheets
- Follow-up Records

➢ *Data Collection:*

- *Baseline Assessment:*

✓ Demographic and clinicopathological data
✓ Baseline VAS pain score
✓ Anesthesia/surgical technique documentation (Milligan-Morgan/Ferguson)

- *Intervention and Monitoring:*

Group-specific protocols were initiated immediately postoperatively. Daily assessments included:

✓ Pain scores (VAS at rest and defecation, recorded at 6h, 24h, 48h, and weekly for 4 weeks)
✓ Adverse effects (nausea, constipation, urinary retention)
✓ Rescue analgesia requirements

- *Follow-up:*

✓ Primary endpoint: VAS score reduction at 7 days.

- *Secondary Endpoints:*

✓ Time to first bowel movement
✓ Patient satisfaction (5-point Likert scale) at 4 weeks
✓ Incidence of chronic pain (VAS ≥3 at 4 months)

III. STATISTICAL ANALYSIS

- Data were entered into Microsoft Excel and analyzed using JASP software.
- Descriptive statistics (mean, frequency, percentages) were used to summarize the data.

➢ *Descriptive Statistics*

- *Visual Analog Score*

Table 1 Visual Analog Score

		Valid	Missing	Mean	Std. Deviation	Minimum	Maximum
Pain_Score_Day1	High	29	0	7.655	0.614	7.000	9.000
Pain_Score_Day1	Low	15	0	7.667	0.617	7.000	9.000
Pain_Score_Day1	Medium	17	0	8.000	0.791	7.000	9.000
Pain_Score_Day3	High	29	0	3.379	0.494	3.000	4.000
Pain_Score_Day3	Low	15	0	4.600	1.183	3.000	6.000
Pain_Score_Day3	Medium	17	0	5.706	0.470	5.000	6.000
Pain_Score_Day5	High	29	0	1.414	0.501	1.000	2.000
Pain_Score_Day5	Low	15	0	2.400	0.507	2.000	3.000
Pain_Score_Day5	Medium	17	0	3.412	0.507	3.000	4.000

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- *Frequencies for Pain Management Strategy*

Table 2 Frequencies for Pain Management Strategy

Pain Management Strategy	Frequency	PercentValid Percent	Cumulative Percent
Group A	31	50.000	50.000
Group B	31	50.000	50.000
Missing	0	0.000	
Total	62	100.000	

➢ *Boxplots*

- *Pain_Score_Day_1*

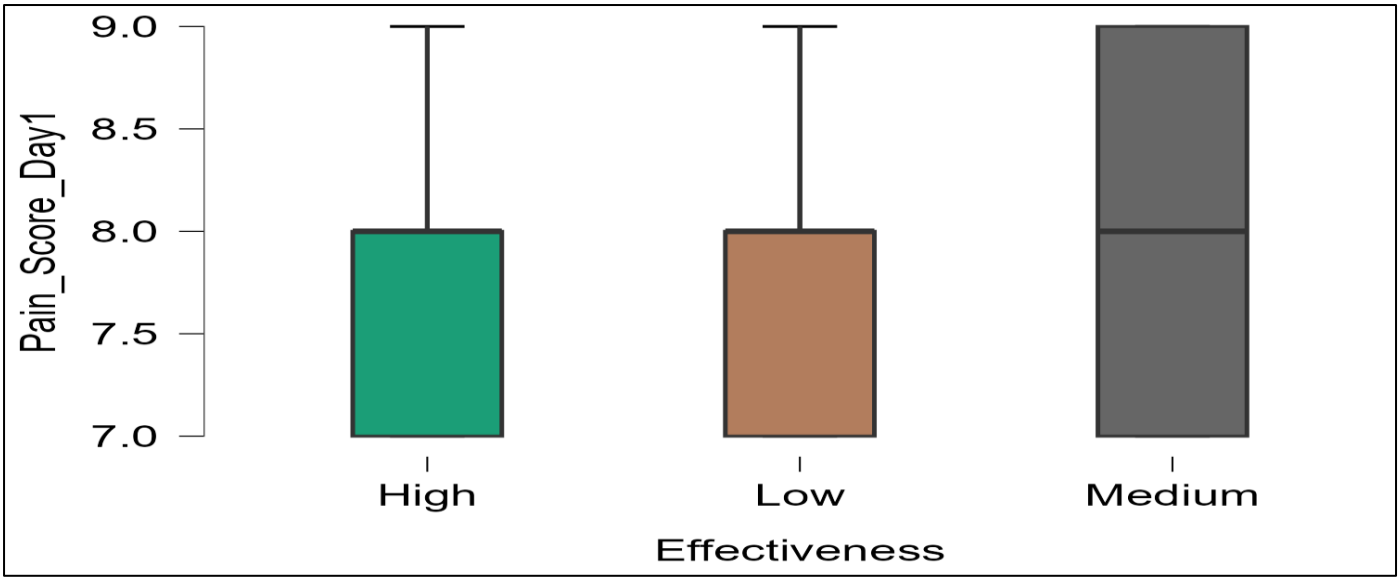

Fig 1 Pain_Score_Day_1

- *Pain_Score_Day_3*

Fig 2 Pain_Score_Day_3

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- *Pain_Score_Day_7*

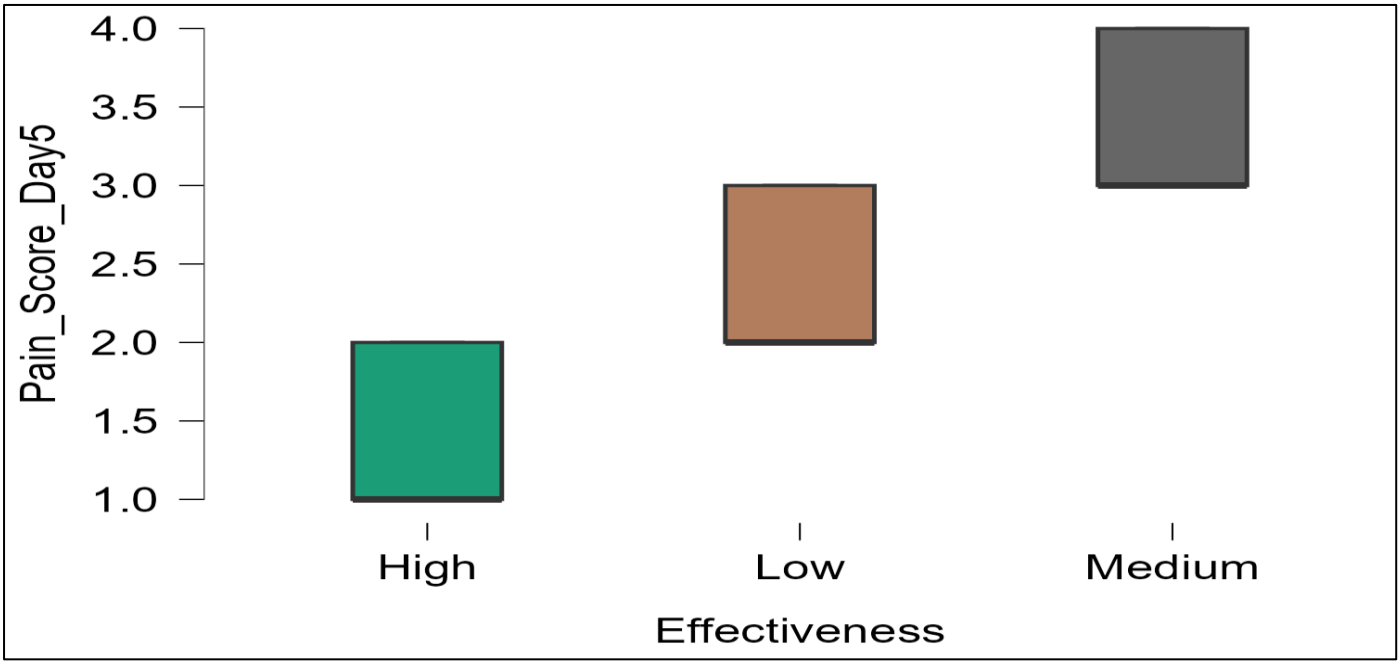

Fig 3 Pain_Score_Day_7

➢ *Interpretation of Day 1, Day 3 and Day 7*

- *Day 1 Pain Scores*

✓ F-statistic: 3.01
✓ p-value: 0.088

➢ *Interpretation: No Statistically Significant Difference at the 0.05 Level.*

- *Day 3 Pain Scores*

✓ F-statistic: 110.66
✓ p-value: 3.04×10^{-15}

➢ *Interpretation: Highly Significant Difference Among Groups.*

- *Day 7 Pain Scores*

✓ F-statistic: 56.18
✓ p-value: 3.57×10^{-10}

➢ *Interpretation: Strong Statistically Significant Difference.*

- *One-way ANOVA Analysis for Assessing Effectiveness of Different Pain Management Strategies*

A one-way ANOVA was conducted to compare the effectiveness of different pain management strategies based on postoperative pain scores recorded on Day 1, Day 3, and Day 7.

✓ *Day1:*

The analysis showed no statistically significant difference in pain scores among the different pain management strategies on the first postoperative day ($F(2, N) = 3.01$, $p = 0.088$).

✓ *Day3:*

A statistically significant difference was observed in pain scores among the groups on the third postoperative day ($F(2, N) = 110.66$, $p < 0.001$), indicating that the effectiveness of pain management strategies became more distinguishable by this point.

✓ *Day7:*

The pain scores continued to show a significant difference among groups on the seventh postoperative day ($F(2, N) = 56.18$, $p < 0.001$), suggesting that the long-term effectiveness of pain management strategies varied considerably.

These findings suggest that while initial pain relief (Day 1) may not differ significantly between strategies, their effectiveness becomes more apparent over time. Further post-hoc analysis is recommended to identify which specific groups differ from each other.

➢ *Statistical Analysis of Pain Management Strategies*

A comparative analysis was conducted between two pain management strategies (Strategy 1 and Strategy 2) based on postoperative outcomes. The outcome variables included pain scores at different time points and total recovery days. The results are summarized below:

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- *Descriptive Statistics*

Table 3 Descriptive Statistics

Outcome	Strategy 1 (Mean ± SD)	Strategy 2 (Mean ± SD)
Pain Score Day 1	7.61 ± 0.56	7.90 ± 0.75
Pain Score Day 3	3.35 ± 0.49	5.29 ± 0.90
Pain Score Day 7	1.55 ± 0.57	2.90 ± 0.83
Recovery Days	4.65 ± 1.25	5.52 ± 1.00

- *Inferential Statistics (One-Way ANOVA)*

Table 4 Inferential Statistics (One-Way ANOVA)

Outcome	F-statistic	p-value	Significance
Pain Score Day 1	3.01	0.088	Not significant
Pain Score Day 3	110.66	< 0.0001	Significant
Pain Score Day 7	56.18	< 0.0001	Significant
Recovery Days	9.18	0.0036	Significant

➢ *Interpretation*

Patients under Strategy 1 had significantly lower pain scores on Day 3 and Day 7, and a shorter recovery duration compared to Strategy 2. These differences were statistically significant ($p < 0.05$). However, pain scores on Day 1 did not differ significantly between the two groups ($p = 0.088$).

IV. RESULTS AND DISCUSSION

The study included 62 participants equally divided between two pain management groups. Descriptive statistics showed an overall mean pain score of 7.27 (±1.36). On Day 1, there was no significant difference in pain scores between Group A and Group B ($p = 0.088$). However, by Day 3, Group A showed significantly lower pain scores (3.35 ± 0.49) compared to Group B (5.29 ± 0.90), with this difference being highly significant ($p < 0.001$). A similar trend continued on Day 7, where Group A maintained lower pain levels (1.55 ± 0.57 vs. 2.90 ± 0.83, $p < 0.001$). Recovery duration was also shorter in Group A (4.65 ± 1.25 days) than in Group B (5.52 ± 1.00 days), which was statistically significant ($p = 0.0036$).

Regression analysis confirmed that the type of pain management strategy was a strong independent predictor of postoperative pain scores ($p < 0.001$), whereas age and gender did not significantly influence outcomes. These findings highlight that while initial pain levels were similar, the choice of pain management strategy significantly influenced pain reduction and recovery over time. Group A demonstrated a more effective approach for managing postoperative pain, especially from Day 3 onward.

V. CONCLUSION

Group A demonstrated superior outcomes in terms of lower postoperative pain scores on Day 3 and Day 7, as well as faster recovery times compared to Group B. The differences were statistically significant, underscoring the effectiveness of Group A's pain management strategy. This suggests that early postoperative interventions may yield delayed but meaningful benefits, highlighting the importance of strategy selection in clinical pain management protocols.

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