

Original Research Article

BILATERAL PUDENDAL NERVE BLOCK FOR POSTOPERATIVE ANALGESIA AFTER HAEMORRHOIDECTOMY: AN ANALYTICAL COMPARATIVE STUDY

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ABSTRACT

Background: Postoperative pain is a major concern following haemorrhoidectomy. Pudendal nerve block (PNB) may provide effective analgesia and reduce the need for systemic analgesics. **Objective:** To evaluate the effectiveness of bilateral PNB in reducing postoperative pain and analgesic requirements and improving postoperative recovery following haemorrhoidectomy.

Materials and Methods: This analytical comparative study included 100 patients undergoing open haemorrhoidectomy for Grade III or IV haemorrhoids. Patients were randomly allocated to receive bilateral PNB (Group A, n=50) or no PNB (Group B, n=50). Postoperative pain was assessed using the Visual Analogue Scale (VAS) at 24 and 48 hours and on postoperative days 3 and 7. Analgesic consumption, hospital stay, and urinary retention were also assessed.

Results: Mean VAS scores were significantly lower in Group A than Group B at 24 hours (2.08 ± 0.38 vs. 4.05 ± 0.43), 48 hours (2.10 ± 0.39 vs. 3.77 ± 0.50), postoperative day 3 (2.02 ± 0.29 vs. 2.73 ± 0.44), and day 7 (1.47 ± 0.50 vs. 2.45 ± 0.50 ; $P < 0.01$ for all). Mean analgesic consumption was also lower on day 1 (11.27 ± 2.36 vs. 22.72 ± 5.79) and day 2 (5.92 ± 0.67 vs. 13.62 ± 3.52 ; $P < 0.01$). Hospital stay of <1 day occurred in 35 (70.0%) patients in Group A versus 4 (8.0%) in Group B. Urinary retention occurred in 4 (8.0%) versus 10 (20.0%), respectively.

Conclusion: Bilateral PNB was associated with significantly better postoperative pain control, lower analgesic requirements, shorter hospital stay, and fewer urinary retention events following haemorrhoidectomy.

Keywords: Haemorrhoidectomy; Pudendal nerve block; Postoperative pain; Analgesia; Urinary retention.

INTRODUCTION

Haemorrhoids are common disorders of the anal canal and may remain asymptomatic in many individuals. Their prevalence increases with age, and it has been estimated that at least half of people older than 50 years have some degree of haemorrhoids.^[1] Symptomatic disease commonly presents with bleeding, prolapse, discomfort, irritation, or pruritus ani. Although many patients respond to conservative or outpatient treatment,

those with persistent or advanced symptoms may require surgery.^[2]

Excisional haemorrhoidectomy remains an effective treatment for prolapsing haemorrhoids and is associated with a low recurrence rate.^[3] However, postoperative pain remains one of its major concerns and may discourage patients from seeking surgical treatment. Pain after haemorrhoidectomy is particularly troublesome during defecation and is thought to be related, at least in part, to spasm and hypertonia of the internal anal sphincter.^[4] The

surgical wounds extend towards the anorectal ring, and factors such as mucosal injury and incorporation of smooth muscle fibres at the vascular pedicle may further contribute to postoperative discomfort.^[3] Because of this, considerable research has focused on improving pain control after haemorrhoidectomy. Postoperative pain is commonly managed with oral analgesics such as non-steroidal anti-inflammatory drugs and acetaminophen.^[5] Although opioids may be used when conventional analgesics are inadequate, their use can be associated with adverse effects, including constipation, which is particularly undesirable following anorectal surgery.^[6,7] Multimodal and opioid-sparing approaches have therefore gained increasing attention in postoperative care.^[5] The PROSPECT group specifically recommends pudendal nerve block (PNB) as part of the analgesic strategy for patients undergoing haemorrhoidectomy.^[8]

The pudendal nerve arises from the S2–S4 nerve roots and provides both sensory and motor innervation to the perineal region. It supplies sensation to the external genitalia, perianal skin and perineum, while its motor branches supply structures including the external anal and urethral sphincters.^[9] The nerve leaves the pelvis through the greater sciatic foramen, passes through the ischiorectal fossa and enters the perineum through Alcock's canal, accompanied by the pudendal vessels.^[10,11] This anatomical distribution provides a rationale for using bilateral PNB to provide targeted analgesia following haemorrhoidectomy.

Several clinical studies have evaluated PNB as an adjunct for postoperative pain control after haemorrhoidectomy, with reports suggesting prolonged analgesia and reduced postoperative complications.^[12,13] However, the evidence is not completely consistent. Systematic reviews and meta-analyses have reported beneficial effects of PNB, while also highlighting variability between studies and limitations in the quality of available evidence.^[11,14] Differences in patient characteristics, surgical techniques, block techniques, and perioperative analgesic protocols may contribute to these variations.

Given the importance of effective pain control after haemorrhoidectomy and the need to minimize opioid and other systemic analgesic requirements, further evaluation of PNB is warranted. The present study therefore aimed to evaluate the effectiveness of bilateral pudendal nerve block in patients undergoing haemorrhoidectomy by comparing postoperative outcomes in patients receiving PNB with those undergoing haemorrhoidectomy without PNB.

MATERIALS AND METHODS

Study design and setting: This analytical comparative study was conducted in the Department of General Surgery at Shri Mahant Indires Hospital (SMIH), Patel Nagar, Dehradun, under Shri Guru Ram Rai Institute of Medical and Health Sciences (SGRRIM&HS). The study was conducted over a period of 18 months and evaluated the role of bilateral pudendal nerve block (PNB) in patients undergoing haemorrhoidectomy.

Study population: Patients undergoing open haemorrhoidectomy for Grade III or Grade IV haemorrhoids were included in the study. The thesis reports a total study population of 100 patients in the main results, with 50 patients allocated to each group. Group A consisted of patients who received PNB, whereas Group B consisted of patients who underwent haemorrhoidectomy without PNB.

Group allocation and intervention: Patients were randomly allocated to either the PNB group or the non-PNB group. Patients in Group A underwent bilateral pudendal nerve blockade as an adjunct to open haemorrhoidectomy, while patients in Group B underwent open haemorrhoidectomy without pudendal nerve blockade. The thesis identifies 2% lignocaine as the local anaesthetic used for the PNB group.

Outcome assessment: Postoperative pain was assessed using the Visual Analogue Scale (VAS). Pain scores were recorded at 24 and 48 hours and on postoperative days 3 and 7. Analgesic consumption was assessed on the first and second postoperative days. Other postoperative outcomes evaluated included duration of hospital stay and postoperative complications, particularly urinary retention.

Statistical analysis: The collected data were entered and analysed using Statistical Package for the Social Sciences (SPSS), version 24. Statistical comparisons between the two groups were performed, with a *P* value of <0.05 considered statistically significant.

RESULTS

The two groups were broadly similar in terms of age, residence, religion, and socioeconomic status. In Group A, the largest proportion of patients were aged 51–60 years (24.0%), while in Group B, the largest proportions were aged 31–40 and >60 years (28.0% each). Males were more common in both groups, comprising 86.0% of Group A and 68.0% of Group B. Most patients were Hindu (94.0% in Group A and 90.0% in Group B) and lived in urban areas (54.0% and 60.0%, respectively). The majority belonged to the middle socioeconomic group (64.0% in Group A and 62.0% in Group B), with similar proportions in the upper and lower socioeconomic categories. [Table 1]

Table 1: Baseline characteristics of the study population

Characteristic	Category	Group A: PNB (n=50)	Group B: No PNB (n=50)
Age, years, n (%)	≤30	7 (14.0)	6 (12.0)
	31–40	11 (22.0)	14 (28.0)
	41–50	11 (22.0)	7 (14.0)
	51–60	12 (24.0)	9 (18.0)
	>60	9 (18.0)	14 (28.0)
Sex, n (%)	Male	43 (86.0)	34 (68.0)
	Female	7 (14.0)	16 (32.0)
Religion, n (%)	Hindu	47 (94.0)	45 (90.0)
	Muslim	3 (6.0)	5 (10.0)
Residence, n (%)	Urban	27 (54.0)	30 (60.0)
	Rural	23 (46.0)	20 (40.0)
Socioeconomic status, n (%)	Upper	6 (12.0)	6 (12.0)
	Middle	32 (64.0)	31 (62.0)
	Lower	12 (24.0)	13 (26.0)

Grade III haemorrhoids were more common in both groups, accounting for 36 (72.0%) in Group A and 29 (58.0%) in Group B. Grade IV haemorrhoids were seen in 14 (28.0%) of Group A and 21 (42.0%)

of Group B. Overall, Group A had a higher proportion of Grade III haemorrhoids, whereas Grade IV haemorrhoids were more frequent in Group B. [Table 2]

Table 2: Distribution of patients according to haemorrhoid grade

Haemorrhoid grade	Group A: PNB (n=50)	Group B: No PNB (n=50)
Grade III	36 (72.0%)	29 (58.0%)
Grade IV	14 (28.0%)	21 (42.0%)
Total	50 (100%)	50 (100%)

Postoperative pain scores were consistently lower in the PNB group at all assessed time points. At 24 hours, the mean pain score was 2.08 ± 0.38 in Group A compared with 4.05 ± 0.43 in Group B. At 48 hours, the scores were 2.10 ± 0.39 and 3.77 ± 0.50 , respectively. On postoperative day 3, the mean scores were 2.02 ± 0.29 in Group A and 2.73 ± 0.44

in Group B, while on day 7 they were 1.47 ± 0.50 and 2.45 ± 0.50 , respectively. The differences were statistically significant at all time points ($P < 0.01$). Overall, patients receiving PNB experienced significantly less postoperative pain than those who did not receive PNB. [Table 3]

Table 3: Comparison of postoperative pain scores between the groups

Time after surgery	Group A: PNB, mean $\pm$ SD	Group B: No PNB, mean $\pm$ SD	P value
24 hours	2.08 ± 0.38	4.05 ± 0.43	<0.01
48 hours	2.10 ± 0.39	3.77 ± 0.50	<0.01
Postoperative day 3	2.02 ± 0.29	2.73 ± 0.44	<0.01
Postoperative day 7	1.47 ± 0.50	2.45 ± 0.50	<0.01

Analgesic consumption was consistently lower in the PNB group than in the no-PNB group. On day 1, the mean analgesic consumption was 11.27 ± 2.36 in Group A compared with 22.72 ± 5.79 in Group B. On day 2, it decreased to 5.92 ± 0.67 in Group A

and 13.62 ± 3.52 in Group B. The differences between the groups were statistically significant on both days ($P < 0.01$), indicating lower analgesic requirements among patients who received PNB. [Table 4]

Table 4: Comparison of analgesic consumption between the groups

Postoperative period	Group A: PNB, mean $\pm$ SD	Group B: No PNB, mean $\pm$ SD	P value
Day 1	11.27 ± 2.36	22.72 ± 5.79	<0.01
Day 2	5.92 ± 0.67	13.62 ± 3.52	<0.01

Hospital stay was shorter in the PNB group compared with the no-PNB group. In Group A, 35 (70.0%) patients stayed for less than 1 day, compared with 4 (8.0%) in Group B. A stay of 1–2 days was reported in 14 (28.0%) patients in Group

A and 30 (60.0%) in Group B. More than 2 days of hospital stay was seen in only 1 (2.0%) patient in Group A compared with 16 (32.0%) in Group B. Overall, patients who received PNB had a shorter postoperative hospital stay. [Table 5]

Table 5: Postoperative hospital stay according to treatment group

Length of hospital stay	Group A: PNB (n=50)	Group B: No PNB (n=50)
<1 day	35 (70.0%)	4 (8.0%)
1–2 days	14 (28.0%)	30 (60.0%)
>2 days	1 (2.0%)	16 (32.0%)
Total	50 (100%)	50 (100%)

Postoperative urinary retention was less common in the PNB group. Urinary retention occurred in 4 (8.0%) patients in Group A compared with 10 (20.0%) in Group B. Most patients did not develop urinary retention, with 46 (92.0%) in Group A and

40 (80.0%) in Group B remaining free of this complication. Overall, urinary retention was less frequent among patients who received PNB. [Table 6]

Table 6: Postoperative urinary retention according to treatment group

Urinary retention	Group A: PNB (n=50)	Group B: No PNB (n=50)
Yes	4 (8.0%)	10 (20.0%)
No	46 (92.0%)	40 (80.0%)
Total	50 (100%)	50 (100%)

DISCUSSION

The present study evaluated the effectiveness of pudendal nerve block (PNB) for postoperative pain management following haemorrhoidectomy. The two groups were broadly comparable in their demographic characteristics. Most patients were middle-aged, and males predominated in both groups. Pande et al. reported a similar male predominance, with 73.3% of participants being male, while 62.2% were below 40 years of age.^[15] The majority of patients in our study were Hindu and from urban areas, with the middle socioeconomic group forming the largest category. Grade III haemorrhoids were more common in both groups, occurring in 72% of patients in the PNB group and 58% in the no-PNB group, whereas Grade IV disease was present in 28% and 42%, respectively. The study also reported a significant association between haemorrhoid grade and PNB efficacy ($\chi^2=4.286$, $df=1$, $p=0.038$). The mean age was similar between the groups (44.47 ± 12.73 years vs. 45.22 ± 12.41 years; $p=0.74$), indicating reasonable baseline comparability. Singh SP et al. also evaluated PNB in patients undergoing haemorrhoidectomy and reported findings related to haemorrhoid grade.^[16]

A clear reduction in postoperative pain was observed in patients receiving PNB. The mean VAS score at 24 hours was 2.08 ± 0.38 in the PNB group compared with 4.05 ± 0.43 in the no-PNB group ($P < 0.01$). At 48 hours, the corresponding scores were 2.10 ± 0.39 and 3.77 ± 0.50 ($P < 0.01$). This difference remained significant on postoperative day 3 (2.02 ± 0.29 vs. 2.73 ± 0.44 ; $P < 0.01$) and day 7 (1.47 ± 0.50 vs. 2.45 ± 0.50 ; $P < 0.01$). These findings indicate sustained postoperative pain relief with PNB. Shukla BB et al. similarly reported significant reductions in VAS scores following PNB, with scores decreasing from 4.88 ± 0.88 at 6 hours to 1.40 ± 0.49 at 24 hours.^[17]

Analgesic requirements were also lower in the PNB group. On postoperative day 1, mean analgesic consumption was 11.27 ± 2.36 μ g compared with 22.72 ± 5.79 μ g in the no-PNB group ($P < 0.01$). On day 2, consumption was 5.92 ± 0.67 μ g and 13.62 ± 3.52 μ g, respectively ($P < 0.01$). Thus, the reduction in pain was accompanied by a lower requirement for rescue analgesics. No directly comparable study on

analgesic consumption at these time points was identified in the source material.

Patients receiving PNB also had a shorter hospital stay. A stay of less than 1 day was recorded in 35 (70.0%) patients in the PNB group compared with 4 (8.0%) in the no-PNB group. A stay exceeding 2 days occurred in only 1 (2.0%) patient versus 16 (32.0%), respectively. Baek et al. also reported differences in hospital length of stay among their study groups.^[18]

Postoperative urinary retention occurred less frequently with PNB, affecting 4 (8.0%) patients compared with 10 (20.0%) without PNB. Overall, the findings of this study suggest that PNB may provide better postoperative pain control, reduce analgesic requirements, facilitate earlier discharge, and decrease urinary retention following haemorrhoidectomy.

This study has some limitations. It was conducted at a single centre with a relatively small sample size of 100 patients, which may limit the generalizability of the findings. The study had an analytical comparative design, and differences in perioperative and postoperative management may have influenced the outcomes. In addition, the follow-up period was limited to the postoperative period assessed in the study, so longer-term outcomes could not be evaluated. Larger, multicentre studies with longer follow-up are needed to confirm these findings and establish the role of bilateral pudendal nerve block in routine haemorrhoidectomy practice.

CONCLUSION

Bilateral pudendal nerve block appears to be an effective adjunct for postoperative pain management following haemorrhoidectomy. It provided better pain control, reduced the need for analgesics, and was associated with a shorter hospital stay. A lower incidence of postoperative urinary retention was also observed in patients receiving PNB. Overall, PNB appears to be a useful component of multimodal postoperative analgesia and may improve recovery and patient comfort following haemorrhoidectomy.

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