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Pudendal nerve block in post- operative pain control in anal surgeries

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Abstract

Foreground: Patients suffering from postoperative pain are more likely to need more time in ambulatory care units, which results in more unplanned admissions to hospitals. Treatment for pudendal neuralgia and elective anorectal operations such as fistula surgery and hemorrhoidectomy both benefit from the pudendal nerve block. This research compared the effectiveness of a pudendal nerve block for treating pain in individuals who had had anal operations to the effectiveness of more traditional analgesic techniques. Methods: A total of 100 patients were included in this research, all of them had anal surgery as follows: Patients in Group A received postoperative pudendal nerve blocks, which were administered to 50 patients in Group A. Five hundred patients in Group B are treated with postoperative regular analgesics. Results: The mean age in group A was 39.6 years, while the mean age in group B was 43.5 years. When it came to the participants' ages, there were no significant differences (P=0.193). In the first group, there were 26 men and 24 women; in the second, there were 26 men and 24 women (P = 1.0). Comparing groups A and B, group B (88.3 kg) had considerably more weight (81.2 kg). P-value was 0.035, although there were no significant differences in height (P-value = 0.403) or BMI (P-value = 0.110) between the two groups. Perianal fistulectomy was the most common operation in Group A, with 42.0% of patients undergoing it. Hemorrhoids were the second most common surgery, with 30% of patients undergoing it (18 percent). Fissurectomy & sphincterotomy was the most common procedure in Group B (36.0%), followed by hemorrhoidectomy (34%) and Perianal fistulectomy (14 percent). Group A had an average surgical time of 19.9 minutes, whereas group B had an average surgical time of 23 minutes. In terms of surgery time, there was no significant difference between the two groups (P-value was 0.148). In terms of VAS scores, group A's median VAS was considerably lower than group B's at 2, 6, 12, and 24 hours (P0.001) for all of them. Additional analgesia was required in only 32% of patients in group A, compared to 78% in group B; the P-value was 0.001. When it came to problems, there were four patients who had bleeding (4 patients), three who became infected (3 patients), and one who experienced incontinence (3 patients) (2 patients). There were 12 patients in Group B who had problems, with infection (4 patients), bleeding (3 patients), incontinence (2 patients), and urinary retention being the most common complications (2 patients). Complications occurred in both groups at the same rate (P=0.812). Neither the length of hospital stay (P=0.151) nor the return to regular activities (P=0.475) differed significantly between the two groups. In order to anticipate when analgesia might be required, researchers used a multivariate logistic regression model. Analgesic use was predicted by group B (odds ratio [OR] = 10.698, 95 percent confidence interval [CI] = 3.527-32.451; p-value=0.001) and surgery time (odds ratio [OR] = 1.172; 95 percent CI = 1.073–1.279; p-value=0.001). With the pudendal nerve block, pudendal neuralgia and elective anorectal treatments like fistula surgery and hemorrhoidectomy may be treated. Postoperative pain and the use of analgesics were both reduced when the pudendal nerve was blocked, but no differences were seen in terms of complications or duration of hospital stay.

Key words: Pudendal nerve block, anal surgeries.

1. Introduction

Patient discomfort is exacerbated by postoperative pain, which increases the length of time spent in ambulatory care units and the likelihood of unexpected hospitalizations following surgery [1]. Most moderate or severe pain cannot be effectively relieved by single analgesics, and these medications come with unwanted side effects [2].

There should be more than just pharmacological treatments available for postoperative pain management. Epidural or opioid-based intravenous patient controlled analgesia (IVPCA) is linked with better pain management after major abdominal surgery [3]. Postoperative pain management may be assisted by non-pharmacological therapies during the perioperative period. These solutions are often low-cost and simple to deploy [4]. Regional anaesthesia administers analgesics directly to the peripheral nerves, generally as a local anaesthetic with or without an adjunct [5].

Treatment for pudendal neuralgia and elective anorectal operations such as fistula surgery and hemorrhoidectomy both benefit from the pudendal nerve block. Transvaginally, transperineally, or transgluteally are all methods of administration. Furthermore, it's been done successfully using ultrasound and computed tomography guidance [6].

For patients who had anal operations, this research compared the pain-control effects of pudendal nerve block with those of conventional analgesic treatments.

2. Patients and Methods

This prospective study included 100 patients, export to anal surgery, and were recruited from General surgery outpatient clinic and emergency room in Benha University Hospital during period from October 2020 to march 2021.

Patients were randomly classified into 2 groups;

- Group A; included 50 patients followed by postoperative pudendal nerve block
- Group B; included 50 patients followed by postoperative ordinary `

The study was approved by the local research ethics committee and written informed consent was obtained after full explanation of the study.

Patients were recruited according to inclusion and exclusion criteria.

Inclusion criteria:

- Sex: males and females.
- Age: above 18 years.
- Patients able to express their pain.
- Patients undergoing to different type of anal surgery.
- Patients fit for general anesthesia.

Exclusion criteria

- Patients unfit for general anesthesia.
- Patient below 18 years.
- Patients refusing pudendal nerve block proceed.
- Patient with neuronal disease contraindicated for nerve block.
- Patient with major comorbid disease e.g., Tuberculosis, Hepatitis, covid 19 infection
- Patients who refuse to continue in this study.
- Patients not able to talk or to express their pain.

Preoperative work-up

All patients were submitted to the following;

1-Complete history taking, including:

- Personal history (Age , occupation , residency)
- History of the present illness, and cause of surgery.
- The past history of diseases, operation, trauma and drugs used was considered.

2-Physical examination including:

- All patients were examined generally, abdominally, neurologically, in addition to local examination.

3-Routine lab. investigations

- Complete blood count (CBC)
- Liver function tests.
- Renal function tests.
- Random blood sugar.
- Coagulation profile.
- ECG

Management

Preoperative preparation:

After doing routine preoperative work up, using a standard protocol, all patients were given one shot of antimicrobial prophylaxis just before surgery.

This post anal operations technique were performed by staff doctors using the same technique and rules.

Group "A"_ Pudendal nerve block Techniques:

Time:

Immediately postoperatively

Position:

Prone jackknife position or Lithotomy position.

<u>Technique</u>

A) Anatomical landmarks guided: (through transperineal or perirectal approach)

- After performing the whole procedure of the needed anal surgery
- The ischial spine is palpated through the rectum.
- Long needle will puncture the skin (perianal or transperineal) directed medial to the ischial tuberosity.
- Needle is advanced posteriorly till it reaches the ischial spine.
- The needle is then advanced through sacrospinous ligament and 1 cm in the medial inferior direction to the ischial spine
- Injection of the local anesthetic solution (Markin).

B) Ultrasound guided :

- Patient is placed in prone (Jack knife position).
- A low frequency 2.5MHZ curved array ultrasound probe is used
- Skin and probe sterilization.
- Scan in transverse planes to visualize the Ischium.
- Move the probe cephalad caudal.
- When the probe is at ischial spine level…the ischum will appear as a straight.
- Color Doppler is used there to localize the Internal pudendal artery.
- Sacrospinous ligament appears as hyperechoic line in continuity with the ischial spine.
- Similarly , Sacrotuberous ligament is seen as a light hyperechoic line (deep) within Gluteaus maximus muscle . and it appears parallel and superior to sacrospinous ligament.
- Pudendal nerve is localized and targeted between the two ligaments.
- The needle is advanced in line with ultrasound probe towards the medial aspect of internal pudendal artery.
- Once the needle passes through sacrotuberous ligament amount of local anesthetic (Markin) is injected.

Fig. (1) A,B : Ultrasound guided pudendal N block.

Group "B"_ postoperative ordinary analgesic:

Time:

After transported to word room.

Position:

Supine or post tonsillectomy.

Technique:

Oral or injection.

Postoperative Follow-up:

Routine antibiotic (3rd generation cephalosporin) therapy and pain control was administered to all patients according to our hospital protocol for clean surgeries. All patients started oral intake after 4 hours.

Hospital stay was calculated and postoperative complications (e.g. wound infection) was monitored before and after patient discharge.

Pain score:

Patients' NRS pain ratings were recorded on postoperative monitoring charts. The scale ranges from 0 to 10, where 0 means no pain and 10 corresponds to the maximum possible pain. The reason we chose this scale is because, compared to other pain intensity scales, it is more easily applicable and understandable by the patients. Another advantage of the NRS scale, compared to other pain scales such as the Visual Analogue Scale (VAS), is the fact that it uses more ratings (0-10), so it is a more sensitive scale in calculating the pain intensity changes that occur [7].

3. Results

Type of surgery and surgical time in both groups

- In group A, the most frequent surgery was hemorrhoidectomy (42.0%), while the least frequent one was anal dilatation (2.0%). In group B, the most frequent surgery was Fissurectomy &sphincterotomy (36.0%), while the least frequent were anal dilatation and partial rectal prolapse (8% for each). No significant difference was noted between both groups regarding surgical time (P-value was 0.148) (Table 1 & figure 1).

Table (1) Type of surgery and surgical time in both groups.

			Group A (n = 50)	Group B (n = 50)	P-value
Type of surgery	Anal dilatation	n (%)	1 (2.0)	4 (8.0)	-
	Fissurectomy&sphincterotomy	n (%)	15 (30.0)	18 (36.0)	
	Hemorrhoidectomy	n (%)	21 (42.0)	17 (34.0)	
	partial Rectal prolapse	n (%)	0 (0.0)	4 (8.0)	
	Perianal fistulectomy	n (%)	9 (18.0)	7 (14.0)	
	Rectal polyp excision	n (%)	4 (8.0)	0 (0.0)	
Surgical time (min)	Mean ±SD		19.9 ±9.4	23 ±11.7	0.148

Independent t-test was used for surgical time

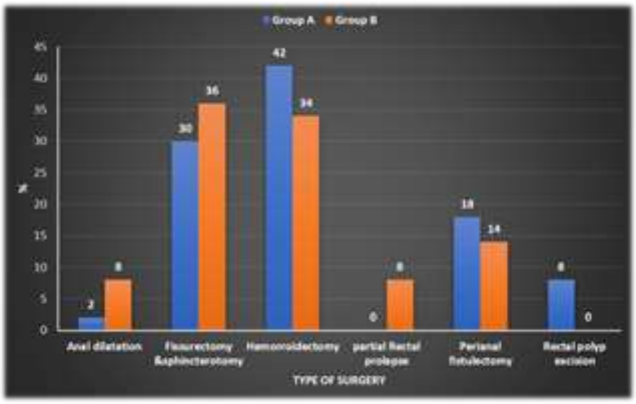

Fig. (1) Type of surgery in both groups

<u>VAS score and need for analgesia in both groups</u>

- At 2, 6, 12, and 24 hours, median VAS in group A was significantly lower than group B. Also, the need of additional analgesia was significantly lower in group A (32%) than group B (78.0%); P-value was <0.001 (Table 2 & figure 2).

Table (2) VAS score and need for analgesia in both groups.

		Group A (n = 50)	Group B (n = 50)	P-value
VAS at 2h	Median (range)	1 (1 - 4)	3 (1 - 6)	<0.001
VAS at 6h	Median (range)	1 (1 - 4)	4 (2 - 7)	<0.001
VAS at 12h	Median (range)	2.5 (1 - 6)	5 (1 - 9)	<0.001
VAS at 24h	Median (range)	3.5 (1 - 7)	5 (1 - 9)	0.001
Need for additional analgesia	n (%)	16 (32.0)	39 (78.0)	<0.001

Mann Whitney U test was used for VAS. Chi-square test was used for the need for additional analgesia

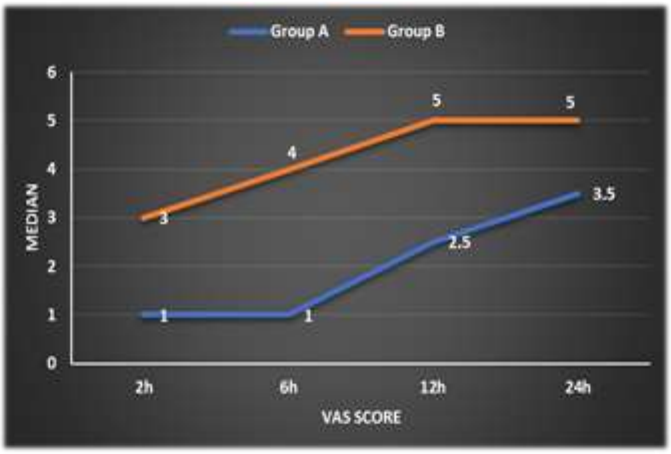

Fig. (2) VAS score and need for analgesia in both groups.

Complications in both groups

- No significant difference was noted between complications in both groups (P-value = 0.538). The most frequent complication in group A and B was hemorrhage (40.0% and 14.3%, respectively) (Table 3).

Table (3) Complications in both groups.

			Group A (n = 50)	Group B (n = 50)	P-value
Complications	n (%)		5 (10.0)	7 (14.0)	0.538
Type of complication*	Anal spasm	n (%)	0 (0.0)	1 (14.3)	
	Hemorrhage	n (%)	2 (40.0)	1 (14.3)	
	Incontinence	n (%)	1 (20.0)	1 (14.3)	
	Infection	n (%)	1 (20.0)	3 (42.9)	
	Urine retention	n (%)	1 (20.0)	1 (14.3)	

Chi-square test was used
*Percentages were calculated based on those who had complications

Hospital stay and return to normal activities in both groups

- There were no significant differences between both groups regarding hospital stay (P-value = 0.151) and return to normal activities (P-value = 0.475) (Table 4).

Table (4) Hospital stay and return to normal activities in both groups.

		Group A (n = 50)	Group B (n = 50)	P-value
Hospital stay (hr)	Median (range)	6 (6 - 36)	12 (6 - 36)	0.151
Return to normal activities (days)	Median (range)	8 (2 - 22)	8 (3 - 21)	0.475

Mann Whitney U test was used

Prediction of the need for additional analgesia

- Multivariate logistic regression analysis was done for the prediction of the need for analgesia. Group B (OR = 10.698, 95% CI = 3.527-32.451, P-value < 0.001) and surgical time (OR = 1.172, 95% CI = 1.073 – 1.279, P-value < 0.001) were significant predictors for the need of analgesia (Table 5).

Table (5) Prediction of the need for analgesia.

	OR (95% CI)	P-value
Group B	10.698 (3.527 - 32.451)	<0.001
Age (years)	1.008 (0.961 - 1.058)	0.739
Gender	1.951 (0.469 - 8.123)	0.358
BMI	0.959 (0.86 - 1.068)	0.446
Surgical time (min)	1.172 (1.073 - 1.279)	<0.001

OR: Odds ratio 95% CI: 95% confidence interval BMI: Body mass index

4. Discussion

Group A had a mean age of 39.6 15.2 years, whereas group B had a mean age of 43.5 14 years. When it came to the participants' ages, there were no significant differences (P=0.193). In the first group, there were 26 men and 24 women; in the second, there were 26 men and 24 women (P = 1.0). Comparing groups A and B, group B (88.3 kg) had considerably more weight (81.2 kg). P-value was 0.035, although there were no significant differences in height (P-value = 0.403) or BMI (P-value = 0.110) between the two groups. Perianal fistulectomy was the most common operation in Group A, with 42.0% of patients undergoing it. Hemorrhoids were the second most common surgery, with 30% of patients undergoing it (18 percent). Fissurectomy & sphincterotomy was the most common procedure in Group B (36.0%), followed by hemorrhoidectomy (34%) and Perianal fistulectomy (14 percent).

Hemorrhoidectomy postoperative analgesia with bilateral pudendal blocking was tested by Imbelloni et al. [8] on an ambulatory patient. The research comprised 200 patients who were scheduled for hemorrhoidectomy and were split into two groups: the Control Group and the Pudendal Group. According to their findings, there were no significant differences in demographic data across the groups.

Ultrasound-guided pudendal nerve block was explored by Di Giuseppe et al. [9], who included 23 patients in the pudendal nerve block group and 26 in the control group in patients having open hemorrhoidectomy. Twenty-seven of the patients (55.1%) were men, with a mean age of 52.5 17.7 years. There were no variations in preoperative risk factors, age, gender, or gender identity between the groups.

The mean surgery time was 19.9 9.4 minutes in group A and 23 11.7 minutes in group B in this research. In terms of surgery time, there was no significant difference between the two groups (P-value was 0.148).

For harmonic scalpel hemorrhoidectomy, Tepetes et al. [10], compared the effects of pudendal nerve block vs local anaesthesia. Anesthesia and hemorrhoidectomy took an average of 17.3 minutes, and the total operational duration was 31.8 minutes. No significant variations in current practise for applying the two local anaesthetic procedures were identified in the reported times for both groups.

Group A's median VAS was considerably lower than group B's at 2, 6, 12, and 24 hours, according to the present study's findings (P0.001). Additional analgesia was required in only 32% of patients in group A, compared to 78% in group B; the P-value was 0.001.

Our findings matched those of Imbelloni et al. [8], who found that the pain score in the Pudendal Group was considerably lower (p0.001) in the first 24 hours than in the Control Group. Table 2 shows the level of discomfort in the first 24 hours, and just one patient in the Pudendal Group complained of severe pain during the course of the study, compared to 15 in the Control Group.

There was a significant difference between the treatment and control groups in VAS scores at 6, 12, 24, and 48 hours (p = 0.046), at 3 days (p = 0.697), at 4 days (p = 0.16), and at 6 days (p = 0.288) for pain on the VAS (Di Giuseppe et al., 2009). At 6, 24 and 48 hours following hemorrhoidectomy, the experimental group's VAS score was considerably lower than the control group's. When comparing the experimental and control groups 12 hours after hemorrhoidectomy, the results were similar.

For example, group A had the highest rate of bleeding (4 patients), infection (3 patients), and incontinence (all three were present in this research) (2 patients). There were 12 patients in Group B who had problems, with infection (4 patients), bleeding (3 patients), incontinence (2 patients), and urinary retention being the most common complications (2 patients). Complications occurred in both groups at the same rate (P=0.812).

Our findings matched those of Li et al, 2021. [11], In compared to the control group, there was no significant difference in the incidence of urine retention in the Pudendal nerve block (PNB) group Between the PNB and control groups, bleeding occurred at a similar rate (OR, 0.08) with a 95% CI of 0.09–7.45 (P=0.84). Compared to controls, the PNB intervention had fewer adverse effects (such as dizziness, vomiting, and nausea) (odds ratio, 0.12; 95% confidence interval, 0.04–0.39; p=0.004).

The pudendal group had one episode of urinary retention, while the control group had two occurrences of postoperative haemorrhage (one managed conservatively, the other requiring surgical intervention) (p = 0.649), according to Di Giuseppe et al. [9]. The pudendal nerve block didn't cause any problems.

Tepetes et al. [10], reported that nine patients (7.5%) from both groups had postoperative problems (4 patients had fever, 3 patients had urine retention, and 2 patients had hemorrhage). There were no statistically significant variations in the occurrence of these problems between the two groups.

Patient's in Group PNB had lower postoperative urine retention and nausea and vomiting than patient's in Group SA, according to the results of the study done by He and colleagues [12]. The difference between the two groups was p=0.034. There were no significant differences between the two groups in terms of postoperative pruritus or respiratory depression.

P-value = 0.151 for hospital stay and P-value = 0.475 for return to normal activities showed no significant differences between the two groups in the current study.

Di Giuseppe et al. [9], on the other hand, found that the average length of hospital stay was 1.2 days in the pudendal group compared to 1.8 days in the control group. Patients were also discharged from the hospital on the same day or on the first postoperative day in the study by Tepetes et al. Only four individuals required a longer stay in the hospital. There was a statistically significant difference between the two groups when it came to the postoperative discharge point for patients who had pudendal nerve block surgery (P = 0.003) when the comparison parameter was how many patients were able to leave the hospital on the day of surgery and the first postoperative day.

According to another study by Naja et al., [13], patients in the pudendal nerve block group had better postoperative pain relief when lying down (P = 0,001), when standing (P = 0,001), sitting, and defecating (P = 0,001), less need for opioid painkillers (P = 0,001), quicker return to normal activities (P = 0,001), and shorter hospital stays (P = 0,001) than those in the general anaesthesia group. In comparison to general anaesthesia, the Pudendal Nerve Block was linked with greater overall patient satisfaction (30/35 vs 9/37; P 0.0001).

Multivariate logistic regression analysis was used to determine when analgesia will be required in the present investigation. As a result of Group B (OR = 11.698, 95 percent CI = 3.527–32.451, P-value0,0001) and surgical time (OR = 1.172, 95 percent of the range = 1.073–1.279, P-value0,0001), analgesia was required.

At 6 hours, only the arm of pudendal treatment was related to postoperative pain on the VAS (OR 0.163, 95 percent CI 0.028–0.936, p = 0.042); at 12 hours, no factors were related; at 24 hours, age (OR 0.9298, 95 percent CI 0.874–0.989), and treatment arm (OR 0.0146, 95 centimetres 0.024–0.906, p = 0.039) were related; and at 48 hours.

5. Conclusion

Treatment for pudendal neuralgia and elective anorectal operations such as fistula surgery and hemorrhoidectomy both benefit from the pudendal nerve block. Postoperative pain and the use of analgesics were both reduced when the pudendal nerve was blocked, but no differences were seen in terms of complications or duration of hospital stay.

References

[1] F.Chung. Recovery pattern and home-readiness after ambulatory surgery. Anesth Analg; vol. 80: pp.896–902,2005.
[2] RL. Carpenter . Optimizing postoperative pain management. Am FAM Physician; vol. 56: pp. 835–44,2007.
[3] F.Brennan, DB.Carr, M.Cousins. Pain management: a fundamental human right. Anesth Analg; vol. 105: pp. 205–221,2007.
[4] C.Small and H.Laycock. Acute postoperative pain management. BJS. DOI: 10.1002/bjs.11477,2020.
[5] R. Powell , NW.Scott , A.Manyande , J.Bruce . Psychological preparation and postoperative outcomes for adults undergoing surgery under general anaesthesia. Cochrane Database Syst Rev.vol. (5),pp. CD008646,2016.
[6] MV. Frago, KM. Latimer. Evaluation and management of common anorectal conditions. Am FAM physician, vol. 85, pp.624_30,2012.
[7] GA.Hawker, S.Mian, T.Kendzerska, M.French. Measures of adult pain: Visual analog scale for pain (vas pain), numeric rating scale for pain (nrs pain), mcgill pain questionnaire (mpq), short-form mcgill pain questionnaire (sf-mpq), chronic pain grade scale (cpgs), short form-36 bodily pain scale (sf-36 bps), and measure of intermittent and constant osteoarthritis pain (icoap). Arthritis Care Res (Hoboken)., vol. 63, pp.S240–52. 2011.
[8] LE.Imbelloni, EM.Vieira, AF.Carneiro. Postoperative analgesia for hemorrhoidectomy with bilateral pudendal blockade on an ambulatory patient: a controlled clinical study. J Coloproctology (Rio Janeiro). vol. 32, pp. 291–6, 2012.
[9] M. Di Giuseppe, A.Saporito, D.La Regina, E.Tasciotti, E.Ghielmini, A.Vannelli. Ultrasound-guided pudendal nerve block in patients undergoing open hemorrhoidectomy: a double-blind randomized controlled trial. Int J Colorectal Dis. vol. 35: pp. 1741–7,2020.
[10] K.Tepetes, D.Symeonidis, G.Christodoulidis, M.Spyridakis, K.Hatzitheofilou. Pudendal nerve block versus local anesthesia for harmonic scalpel hemorrhoidectomy: a prospective randomized study. Tech Coloproctol.; vol. 14, pp. 1–3, 2010.
[11] J.Li, H.Liu, K.Qin, M.Liu, H.Yang, Y. Li. Efficacy and safety of pudendal nerve block for postoperative analgesia of hemorrhoids: a systematic review of 7 randomized controlled trials. Ann Palliat Med, 2021.
[12] J.He, L.Zhang, DL.Li, WY.He, QM.Xiong, XQ.Zheng. Ultrasound-Guided Pudendal Nerve Block Combined with Propofol Deep Sedation versus Spinal Anesthesia for Hemorrhoidectomy: A Prospective Randomized Study. Pain Res Manag, 2021 .
[13] Z.Naja, M.El-Rajab, M.Al-Tannir, F.Ziade, R.Zbibo, M.Oweidat. Nerve stimulator guided pudendal nerve block versus general anesthesia for hemorrhoidectomy. Can J Anesth.; vol. 53, pp.579–85,2006.