

Role of Local Infiltration of Bupivacaine Versus Bupivacaine Plus Ketamine In Reducing Postoperative Pain Score After Anal Fistula Surgery

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ABSTRACT

Objective To compare the postoperative pain scores in patients with local infiltration of bupivacaine versus bupivacaine plus ketamine after anal fistula surgery.

Study design Comparative study.

Place & Duration of study Department of Surgical Sciences, Baqai Medical University Karachi, from July 2015 to December 2020.

Methodology The study included 126 patients who had fistulotomy or fistulectomy under spinal anesthesia. Patients were divided into two groups. In Group A, postoperatively, patients received 2ml of 0.5% bupivacaine plus 1ml of normal saline while those in Group B had infiltration of 2ml of 0.5% bupivacaine plus 1ml of ketamine at dentate line. Postoperative pain was assessed using visual analogue scale (VAS) at 6, 12, and 24 hours following the end of procedure. Mean pain scores among groups were compared using student t test.

Results The pain scores on VAS at 6 hours and 12 hours postoperatively were less in Group B that was statistically significant ($p=0.000$ and 0.006 respectively), whereas the score at 24 hours, despite being low in same group but not significant ($p=0.071$). Overall the mean pain score was less in Group B than Group A.

Conclusion Local infiltration of bupivacaine plus ketamine is better at ameliorating postoperative pain after anal fistula surgery compared to bupivacaine alone.

Key words Fistula-in-ano, Fistulotomy, Fistulectomy, Postoperative pain, Anal surgery.

INTRODUCTION:

Worldwide almost 5% of the adult population present to surgical clinics with the anorectal conditions, of this fistula-in-ano accounts for 8% to

25% of cases.¹ It can occur at any age especially in adult male, with male to female ratio of 5.6:1.² Anal fistula is a pathological communication between the anal glands and the perianal skin, which results in drainage of stool, blood or pus from a perianal opening with surrounding granulation tissue.²

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Operative procedure for fistula-in-ano can be done under general anesthesia (GA), spinal anesthesia (SA) or local anesthesia (LA).³ However, the practice of LA, where possible appears to be reasonable as it results in less morbidity, short hospital stay and early return to routine activities.⁴ Perianal operation are commonly carried out as inpatient because of postoperative pain and complications but procedures

are also performed as day-care surgery.⁵ For postoperative pain control various medications are in use and quest for newer approaches are also ongoing. Different anesthesia techniques have been reported in literature for surgical correction of anorectal conditions, however studies on the combined use of local and spinal anesthesia are less often reported.⁶⁻¹⁰

Studies have shown that adding ketamine to LA can result in postoperative pain reduction in certain surgeries like abdominal hysterectomy and hernia surgery.^{11,12} The studies on the use of local infiltration of ketamine, alone or in combination with other drugs, after anal fistula surgery for amelioration of pain, are scarce. This study was performed to compare the pain relief following local bupivacaine infiltration versus bupivacaine with ketamine combination in patients for fistula-in-ano surgery.

METHODOLOGY:

This was a comparative study conducted from July 2015 to December 2020 in the Department of Surgical Sciences, Baqai Medical University Karachi. Institution review board approval was obtained and informed consent taken from the patients. WHO calculator for sample size was employed to achieve sample size where level of significance and confidence interval were kept 5% and 90% respectively. For sampling, non-probability consecutive approach was used. This study included 126 patients, more than 14 years of age with fistula-in-ano, who underwent either fistulotomy or fistulectomy. Computer based randomization software (Research randomizer) was utilized to allocate patients into two groups. In Group A after surgery patients had an infiltration of 2ml 0.5% bupivacaine plus 1ml normal saline while those in Group B received 2ml of 0.5% bupivacaine plus 1ml of ketamine at dentate line.

Patients with the history of spinal cord injury or concomitant anal or rectal disease like ulcerative colitis, Crohn's diseases, anal or rectal carcinoma, in whom conversion from spinal to general anesthesia was required during surgery and with contraindications for the drugs used like hypersensitivity, erythema, urticaria, allergic dermatitis, hyperpigmentation and purpura after injection, neurological diseases, asthma, raised blood pressure, cardiac diseases, were excluded from the study. All the patients received spinal anesthesia in sitting posture with injection of 1ml of bupivacaine 0.5% by 25G needle at L3-L4 level. Patients were kept in sitting position for five minutes and after attaining suitable anesthesia, the position

was changed to supine before placing them into lithotomy position. After fistulotomy or fistulectomy drugs were infiltrated at dentate line.

The variables assessed in each group included age, gender, comorbid, body mass index (BMI), duration of surgery, and intensity of postsurgical pain using Visual Analogue Scale (VAS), at 6, 12, and 24 hours after surgery. Postsurgical complications like nausea, vomiting, headache, urinary retention and bleeding were also assessed. In VAS, the pain intensity was displayed linearly from 0 to 10, and patients were taught to demonstrate pain level from 0 (no pain) to 10 (most severe pain ever faced by the patient). For the pain (VAS > 3), patient was given 10mg of nalbuphine intramuscular route. Data were entered in a pre designed form for each patient.

Statistical software SPSS version 19 was used to analyze data. For qualitative variables like gender, comorbid, postoperative complications frequencies were computed. For age, BMI, duration of surgery, VAS score, mean scores were calculated. For statistical significance student t test was applied to compare the main outcome measure; the mean pain score on VAS. A p value of <0.05 was considered as statistically significant.

RESULTS:

The mean age of the patients was 39.99 ± 10.99 year ($p=0.703$). Age, BMI, gender distribution, comorbid conditions like diabetes mellitus and hypertension in both groups were statistically insignificant (table I). The mean duration of the procedure was 21.48 ± 7.91 minutes ($p=0.640$). All the variables were statistically insignificant.

The pain scores on VAS at 6 and 12 hours postoperatively were less in Group B ($p=0.000$ and $p=0.006$) that were statistically significant. VAS score at 24 hours, despite being less in Group B was not significant ($p=0.071$). Postoperatively, nine patients experienced postoperative nausea and vomiting (PONV). Headache was reported in 13 patients while 12 had urinary retention. Details are given in table II and III.

DISCUSSION:

Postoperative pain management is an important aspect of perioperative care as it may affect the surgical outcome. The post-surgical pain not only results in long hospital stay but also in lack of satisfaction. It is therefore necessary to provide a good postoperative analgesia that not only hastens postoperative recovery but also early mobilization.¹³ This study revealed substantial and promising pain-relieving impact of local injection of bupivacaine,

Table I: Demographic and Clinical Details

Characteristics	Total	Group A	Group B	p value
Mean Age (years)	39.99±10.99	39.57±11.41	40.32±10.65	0.703
Male	97 (76.98%)	47 (74.60%)	50 (79.36%)	0.262
Female	29 (23.01%)	16 (25.39%)	13 (20.63%)	0.262
Hypertension	16 (12.69%)	9 (14.28%)	7 (11.11%)	0.296
Diabetes Mellitus	14 (11.11%)	5 (7.93%)	9 (14.28%)	0.128
Body Mass Index	29.24±5.03	28.86±4.71	29.63±5.36	0.447
Mean Duration of Procedure (Minutes)	21.84±8.71	21.48±7.91	22.21±9.50	0.640

Table II: Postoperative Pain Scores

	Group A	Group B	p value
Pain VAS Score (6 Hours)	6.38±1.61	4.91±0.95	0.000*
Pain VAS Score (12 Hours)	6.38±1.61	4.91±0.95	0.000*
Pain VAS Score (24 Hours)	4.83±1.72	4.09±1.27	0.006*
Pain VAS score (24 Hours)	3.76±1.34	3.35±1.19	0.071
Mean Pain Score	4.99±1.89	4.11±1.24	0.002*

Table III: Comparison of Complications In Both Groups

Complications	Total (n=126)	Group A (n=63)	Group B (n=63)	p value
Postoperative Nausea & Vomiting	9 (7.14%)	4 (6.35%)	5 (8.33%)	0.335
Headache	13 (10.32%)	8 (12.7%)	5 (8.33%)	0.211
Urinary retention	12 (9.52%)	4 (6.35%)	8 (12.7%)	0.112
Post-operative Bleeding				
No Bleeding	107 (85%)	55 (87.30%)	52 (82.54%)	0.227
Mild Bleeding	15 (11.90%)	9 (14.28%)	6 (9.52%)	0.204
Moderate Bleeding	4 (3.17%)	1 (1.58%)	3 (4.76%)	0.154

especially when it was used with ketamine.

After perianal surgeries for pain control, different modalities are in use. It include pudendal nerve block, perianal infiltration of local anesthetics or botulinum toxin, and topical applications of glyceryl nitrate, metronidazole and calcium channel blockers.¹⁴ Studies have shown better outcome with the use of bupivacaine and ketamine in different surgical procedures.^{11,12} It was reported that ketamine not only considerably reduced the pain score and dosage of rescue painkillers but also increased the time to the first dose of opiate when compared with the group receiving normal saline. Addition of ketamine with subcutaneous bupivacaine infiltration, prolonged the analgesic effect.

In our study, the mean age of the research participants was 39.99±10.99 year. This is comparable with other studies. Studies showed male predominance as found in our study.^{14,15,16} In index study both the study groups were comparable in

demographic as well as clinical parameters. The pain scores at 6 and 12 hours postoperatively were less in Group B that was statistically significant. This is similar to other studies.^{17,18}

Postoperatively twelve patients developed retention of urine which is consistent with previous studies where it was reported in 7% to 20% of patients after anorectal surgery.¹⁹ However, same frequency has not been reported in other study.¹⁹ Postoperatively, nine patients had nausea and vomiting which is quite comparable to other studies.^{1,14} The headache is reported in number of patients which is more when compared to other study.²⁰ Although significant postsurgical bleeding necessitating any intervention was not experienced in our study however, incidence of mild and moderate bleeding was reported in 15% patients in another study.²¹

CONCLUSION:

Postoperative pain scores were found statistically significant in group of patients where local infiltration of bupivacaine plus ketamine was used in comparison with bupivacaine alone.

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Syed Ali Haider: Conception, study design, data collection, data interpretation, statistical analysis, and manuscript writing.
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Khalid Ahmed: Conception, data collection, data interpretation, and manuscript writing.
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