J Korean Surg Soc 2010;78:106-110
DOI: 10.4174/jkss.2010.78.2.106

□ 원 저 □

Local Perianal Block in Anal Surgery: The Disadvantage of Pain during Injection despite High Patient Satisfaction

Department of Surgery, Kyung Hee University School of Medicine, Seoul, Korea

Sun Jin Park, M.D., **Sung Il Choi,** M.D., Ph.D.,
Suk Hwan Lee, M.D., Ph.D., **Kil Yeon Lee,** M.D., Ph.D.

Purpose: We evaluated the usefulness of anal surgery using local perianal block and assessed patient satisfaction.
Methods: From January to October 2008, a total of 41 consecutive patients consented to anal operation with local perianal block for stapled hemorrhoidopexy (n=15), excisional hemorrhoidectomy (n=9), fistulotomy (n=13), or abscess drainage (n=4). Postoperative pain was evaluated on a visual analogue scale (VAS) from 0 to 10. Patient satisfaction was evaluated through telephone interviews.
Results: The mean peak VAS scores on the day of operation were 3.3 after stapled hemorrhoidopexy, 2.9 after excisional hemorrhoidectomy, 2.6 after fistulotomy, and 3.5 after abscess drainage; on postoperative day 1, the scores were 1.3, 1, 0.9, and 2.3, respectively. The majority of patients (31; 86.1%) were satisfied with the postoperative results (very satisfied 12, satisfied 19, only fair 5, unsatisfied 0). More than half of the patients (23; 63.9%) were satisfied with the use of local anesthesia (very satisfied 4, satisfied 19, only fair 12, unsatisfied 1). The mean VAS scores during injection were significantly different between the satisfied group (very satisfied and satisfied) and not-satisfied group (only fair and unsatisfied) treated with the local anesthesia (satisfied group: 3.5 and not-satisfied group: 5.4, P=0.04). Most patients (30; 83.3%) would undergo this anesthetic procedure again if future anal surgeries were necessary.
Conclusion: Local perianal block is feasible for various anal operations and results in a high degree of satisfaction among patients. However, the pain associated with injection has an adverse effect on patient satisfaction. **(J Korean Surg Soc 2010;78:106-110)**

Key Words: Local anesthesia, Proctology, Injection, Pain, Satisfaction

INTRODUCTION

While general and regional anesthetics provide reliable anesthesia, they are often associated with nausea, vomiting, urinary retention, and motor blockade of the lower limbs. Moreover, repeated spinal or epidural punctures performed by inexperienced anesthesiologists often cause delays in the tight schedule of operations and result in an increase in patient complaints of back pain during the painful postoperative course.

Several reports have described various forms of local anesthetic infiltration for anal surgery.(*1-7*) Local perianal infiltration is a simple procedure that can be easily learned and performed by a surgeon and this method allows the operation to begin almost immediately.

We evaluated the feasibility of local perianal block as the sole method of anesthesia for anal surgery and assessed patient satisfaction.

Correspondence to: Kil Yeon Lee, Department of Surgery, Kyung Hee University Hospital, 1, Hoegi-dong, Dongdaemun-gu, Seoul 130-702, Korea. Tel: 02-958-8241, Fax: 02-966-9366, E-mail: isaac34@korea.com
Received October 12, 2009, Accepted December 14, 2009
This paper was presented at the Korean Society of Coloproctology Spring Meeting in 2009.
This work was supported by the research paper scholarship granted by the graduate school of Kyung Hee University in the first semester of 2008.

METHODS

From January to October 2008, a total of 41 consecutive patients with various anal disorders underwent an operation at Kyung Hee University Hospital. The patients were informed that they would undergo their operation under local anesthesia. All operations were performed in the operating room by a single surgeon. The types of operations included stapled hemorrhoidopexy, excisional hemorrhoidectomy, fistulotomy, and abscess drainage. Patients were instructed to self-administer a Fleet® enema (CB Fleet Co., Inc., Lynchburg, VA, USA) on the morning of the operation. Pain was recorded using the visual analogue scale (VAS, 0 indicating no pain and 10 indicating the worst imaginable pain) during hospitalization. In telephone interviews that took place 1 or 2 months later after surgery, we asked patients about their satisfaction with the surgical outcome and local anesthetic method. Patient satisfaction was scored on a four point scale including very satisfied, satisfied, only fair, and unsatisfied. We also asked the patients if they would willingly consider a perianal block for any subsequent surgery.

1) Anesthesia

Patients were placed in the prone jackknife position, and the perianal region was exposed by adhesive tape retraction at the gluteal folds. Topical local anesthetic cream, a eutectic mixture of lidocaine 2.5% and prolocaine 2.5% (EMLA®; AstraZeneca, Södertälje, Sweden) was applied to the perianal region in the ward 1 hour before the operation. Sedation consisted of 10 mg diazepam in the ward 1 hour before the operation and 2.5 mg midazolam in the operating room immediately before surgery. If a patient was intolerant of pain during injection or if additional sedation was needed, 2.5 mg of midazolam was administered intravenously in the operating room. Intraoperative monitoring of patients was conducted with electrocardiography, pulse oximetry, and intermittent readings of blood pressure.

All patients received a perianal block with local anesthetic.(5) This was performed with ropivacaine (Narop®; AstraZeneca, Södertälje, Sweden). Twenty milliliters of a 7.5 mg/ml solution were mixed with an equal volume of a 2.0 mg/ml solution. The mixture of 40 ml at 4.75 mg/ml was injected immediately peripherally to the external sphincter, starting behind the anus. The needle was then directed at 45° anterolaterally, and 5 ml was injected on both lateral sides. This procedure was repeated in the same fashion anteriorly in the perineum. Eight columns of 5 ml each were injected into the perisphincteric ischiorectal fat while the needle was withdrawn. A 20-ml syringe was fitted with a 60-mm intramuscular needle advanced to the level of the levator muscle.

For the case of stapled hemorrhoidopexy, the submucosa beneath the purse-string suture was infiltrated with an additional dose of ropivacaine, 10～15 ml of a 2.0 mg/ml solution, before inserting the stapler. This ensured that patients felt no pain during the closure and firing of the stapler. For the fistulotomy, additional ropivacaine was injected peripherally to the external opening. In order to confirm the effectiveness of local anesthesia, the procedures must be painless, including pinching of anal skin, insertion of retractor, and dilation of the sphincter.

2) Statistical analysis

A Wilcoxon signed-ranks test and a t test were used. The level of significance was $P<0.05$.

RESULTS

Forty-one patients underwent operations, including stapled hemorrhoidopexy (n=15), excisional hemorrhoidectomy (n=9), fistulotomy (n=13), and abscess drainage (n=4) (Table 1). The mean operation time (including the anesthetic infiltration) was 22.4±9.4 minutes (range, 15 to 50 minutes). A few minutes after local infiltrations, patient's anus became relaxed and patulous, often leading to exposure of inside mucosa. Satisfactory relaxation of the sphincter was confirmed by painless dilation of the anal canal with retractors. Particularly in cases of stapled hemorrhoidopexy, although the circular anal dilator has a large diameter, its placement into the anal canal was feasible.

Table 1. Type of operation and postoperative pain

Operation	Mean pain score*			
	Injection	During operation	Operative day	Postoperative day 1
Stapled hemorrhoidopexy (n=15)	3.7 (0～8)	1.8 (0～9)	3.3 (1～5)	1.3 (0～4)
Excisional hemorrhoidectomy (n=9)	5.6 (1～8)	1.7 (0～8)	2.9 (0～7)	1 (0～3)
Fistulotomy (n=13)	2.7 (0～7)	2.1 (0～8)	2.6 (0～6)	0.9 (0～4)
Abscess drainage (n=4)	1 (0～2)	0.7 (0～2)	3.5 (3～4)	2.3 (0～5)

*Pain was scored on a visual analog scale on which 0 indicated no pain and 10 indicated the worst imaginable pain.

Because the analgesia lasted for a few hours, additional anesthesia for maintenance was not required in a brief duration of operation. Rarely, however, patients who unexpectedly complained of pain were controlled by topical injection of lidocaine (1～2 ml of 1% solution). No local or systemic complications related to the local anesthesia were observed during or after surgery. No patient required conversion to general anesthesia.

The mean peak pain score during operation was 1.8 in stapled hemorrhoidopexy, 1.7 in excisional hemorrhoidectomy, 2.1 in fistulotomy, and 0.7 in abscess drainage. The mean peak postoperative pain score on the day of operation was 3.3 after stapled hemorrhoidopexy, 2.9 after excisional hemorrhoidectomy, 2.6 after fistulotomy, and 3.5 after abscess drainage; on postoperative day 1, the scores were 1.3, 1, 0.9, and 2.3, respectively. All except two patients required postoperative analgesics and were treated with oral administrations or injections of non-steroidal anti-inflammatory drugs. Postoperative telephone interviews were completed by 36 (87.8%) of 41 patients. Postoperative complications were reported, including skin tags in five patients, tenesmus in two patients, and intermittent anal bleeding in one patient. All reported complications developed from the patients with hemorrhoids.

The majority of patients (31; 86.1%) were satisfied with the postoperative results (very satisfied 12, satisfied 19, only fair 5, unsatisfied 0). More than half of the patients (23; 63.9%) were satisfied with the local anesthesia (very satisfied 4, satisfied 19, only fair 12, unsatisfied 1). The mean pain score during injection of the local anesthetics was 4.1, which was significantly higher than the mean peak pain score of 3.0 on the day of operation (P=0.03), or than that of 1.8 during operation (0.002). There was a significant difference between the mean pain score during injection in the satisfied patient group (very satisfied and satisfied) and the not-satisfied group (only fair and unsatisfied) (satisfied group, 3.5 and not-satisfied group, 5.4, P=0.04) (Table 2). However, the mean peak pain score during operation showed a tendency of difference between the two groups, while it was not significant (satisfied group, 1.3 and not-satisfied group, 2.8, $P>0.05$). Moreover, the mean peak postoperative pain score on the day of operation was not significantly different between the two groups (on the day operation: satisfied group, 2.7 and not-satisfied group, 3.0, $P>0.05$). Most patients (30; 83.3%) reported that they would undergo this local anesthetic procedure again for any future anal surgery, whereas three patients reported that they would not, and one patient was unsure.

Table 2. Pain scores according to patient satisfaction with local anesthesia

	Mean pain score		P-value
	Satisfied group (n=23)	Not-satisfied group (n=13)	
Injection	3.5	5.4	0.04
During operation	1.3	2.8	0.09
Operative day	2.7	3.0	0.71

DISCUSSION

General or spinal anesthesia provides excellent surgical conditions for surgeons, but patients may suffer a longer time to mobilize, greater hospital costs, or potential anesthetic side effects such as nausea, vomiting, and headache.

Local anesthesia was tried as a supplemental procedure to decrease postoperative pain after hemorrhoidal surgery,(*3,8*) and several recent studies have shown the feasibility and safety of local anesthesia as a sole anesthetic method for hemorrhoidectomy or other anal operations.(*1,2,4,5,7,9*) Although there were some differences in the methods and agents of local injection, local anesthesia had many advantages, including satisfactory relaxation of the anal sphincter, decreased hospital stays and costs, and much quicker turnover between cases.(*10*)

In the present study, we used the perianal block technique, which Nystrom et al.(*5*) described as a perisphincteric deposition of the anesthetic agent extending up to the levator. The method was simple and easy to learn. Injection of the anesthetic agent was performed in a few minutes, allowing the operation to begin quickly. The perianal block technique was used for most proctological procedures and resulted in a high degree of satisfaction among patients. Nystrom et al.(*5*) suggested that as long as the anesthetic was injected into the ischiorectal fat peripheral to the sphincter, the injection was almost painless except for the skin puncture. In our study, however, pain during injection was an important factor that had an adverse effect on patient satisfaction with this method of anesthesia.

Because the anal canal and the perianal skin are very sensitive areas, pain associated with a local injection is one of drawbacks to local anesthesia. Nivatvongs' method in which the anesthetic solution is intra-anally injected into the submucosa above the dentate line is theoretically almost painless,(*11*) but may be difficult for patients with deep or tall buttock cheeks and obese patients. Gerjy et al.(*10*) proposed that their method of injection into the ischiorectal fat avoided painful injection into the anoderm and intersphincteric space and could, therefore, be used without sedation. However, in their study, 18 of 33 patients were sedated with propofol or alfentanil during the operation. Local anesthesia combined with deep intravenous sedation based on propofol has been shown to be a safe and effective technique for prone-position anorectal surgery,(*12,13*) but it puts such a heavy burden on both the surgeon and patient that it entails a potential risk of pulmonary complications, such as hypoventilation and hypoxia.

Ho et al.(*2*) reported that intraoperative pain was minimized by using EMLA® cream before injection of the anesthetic. However, they administered intravenous midazolam to 17 of 27 patients for intraoperative sedation. In the present study, our patients reported serious pain during anesthetic injection, even though EMLA® cream was preoperatively applied. Because our results are opposite to those of many other studies showing the benefits of EMLA® cream, it may be argued that the application time or occlusive dressing was incomplete. We tried to abide the protocol of occlusive dressing for 60 minutes, and found that it was difficult to maintain this occlusive dressing around the anus because of patient movements. Wahlgren and Quiding(*14*) reported that the depth of skin analgesia with acceptable pain was less than 3 mm after 60 minutes of EMLA® cream application. Therefore, we believe that the pain associated with the injection of an anesthetic agent does not decrease despite the use of EMLA® cream.

Arndt et al.(*15*) reported that rapid injection hurts more than slow infiltration. Scarfone et al.(*16*) suggested that a slower injection rate is associated with less pain because of less rapid distention of local tissue and activation of fewer nerve endings. In our study, a narrow 25-gauge needle was fitted with a large volume syringe and 40 ml of ropivacaine was administered by eight columns of 5 ml each over the period of a few minutes. Thus, we hypothesize that the pain is mainly caused by rapid injection. Future studies are needed to determine the rate of injection at which most patients feel minimal or no pain.

CONCLUSION

By using local anesthesia supplemented with conscious sedation, satisfactory relaxation of the anal sphincter and perianal anesthesia were obtained, and various anal operations were well tolerated with a high degree of satisfaction among patients. However, the pain associated with injection had an adverse effect on patient satisfaction and should be improved.

REFERENCES

1) Gabrielli F, Cioffi U, Chiarelli M, Guttadauro A, De Simone M. Hemorrhoidectomy with posterior perineal block: experience with 400 cases. Dis Colon Rectum 2000;43:809-12.
2) Ho KS, Eu KW, Heah SM, Seow-Choen F, Chan YW. Randomized clinical trial of haemorrhoidectomy under a mixture of local anaesthesia versus general anaesthesia. Br J Surg 2000;87:410-3.
3) Luck AJ, Hewett PJ. Ischiorectal fossa block decreases posthemorrhoidectomy pain: randomized, prospective, double-blind clinical trial. Dis Colon Rectum 2000;43:142-5.
4) Esser S, Khubchandani I, Rakhmanine M. Stapled hemorrhoidectomy with local anesthesia can be performed safely and cost-efficiently. Dis Colon Rectum 2004;47:1164-9.
5) Nystrom PO, Derwinger K, Gerjy R. Local perianal block for anal surgery. Tech Coloproctol 2004;8:23-6.
6) Ong CH, Chee Boon Foo E, Keng V. Ambulatory circular stapled haemorrhoidectomy under local anaesthesia versus circular stapled haemorrhoidectomy under regional anaesthesia. ANZ J Surg 2005;75:184-6.
7) Delikoukos S, Zacharoulis D, Hatzitheofilou C. Local posterior perianal block for proctologic surgery. Int Surg 2006;91:348-51.
8) Vinson-Bonnet B, Coltat JC, Fingerhut A, Bonnet F. Local infiltration with ropivacaine improves immediate postoperative pain control after hemorrhoidal surgery. Dis Colon Rectum 2002;45:104-8.
9) Gerjy R, Lindhoff-Larson A, Sjodahl R, Nystrom PO. Randomized clinical trial of stapled haemorrhoidopexy performed under local perianal block versus general anaesthesia. Br J Surg 2008;95:1344-51.
10) Gerjy R, Derwinger K, Nystrom PO. Perianal local block for stapled anopexy. Dis Colon Rectum 2006;49:1914-21.
11) Nivatvongs S. An improved technique of local anesthesia for anorectal surgery. Dis Colon Rectum 1982;25:259-60.
12) Read TE, Henry SE, Hovis RM, Fleshman JW, Birnbaum EH, Caushaj PF, et al. Prospective evaluation of anesthetic technique for anorectal surgery. Dis Colon Rectum 2002;45:1553-8; discussion 8-60.
13) Sun MY, Canete JJ, Friel JC, McDade J, Singla S, Paterson CA, et al. Combination propofol/ketamine is a safe and efficient anesthetic approach to anorectal surgery. Dis Colon Rectum 2006;49:1059-65.
14) Wahlgren CF, Quiding H. Depth of cutaneous analgesia after application of a eutectic mixture of the local anesthetics lidocaine and prilocaine (EMLA cream). J Am Acad Dermatol 2000;42:584-8.
15) Arndt KA, Burton C, Noe JM. Minimizing the pain of local anesthesia. Plast Reconstr Surg 1983;72:676-9.
16) Scarfone RJ, Jasani M, Gracely EJ. Pain of local anesthetics: rate of administration and buffering. Ann Emerg Med 1998;31:36-40.