Local Perianal Nerve Block Versus Spinal Block for Closed Hemorrhoidectomy: A Ramdomized Controlled Trial

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Objective: *To compare analgesic effectiveness, postoperative pain, complications, and patients' satisfaction between two randomly allocated groups - one group that had local perianal nerve block and another group that had spinal block following closed hemorrhoidectomy.*
Material and Method: *Sixty-seven patients underwent elective hemorrhoidectomy. Of these, 33 were randomly allocated to receive spinal anesthesia (SA) while 34 received perianal local analgesia (LA) with bupivacaine. Pain measurement at 6 and 24 hours following hemorrhoidectomy, the quantity of postoperative analgesic medication administered, patient's satisfaction and complications were recorded.*
Results: *Among the patients who had SA, there were 5 patients (15.2%) who developed hypotension during surgery. There was no reported case of hypotension among those who had LA. There was no significant difference in degree of median postoperative pain at 6 hours (LA: 38 vs. SA: 50 with VAS; p = 0.09) and at 24 hours (LA: 31 vs. SA: 35 with VAS; p = 0.35) between the two groups. Patients had a high satisfaction on both anesthetic methods. Patients in the SA group required more parenteral analgesics (p = 0.03) and had a higher incidence of urinary retention than those in the LA group (SA: 30.3% vs. LA: 8.8%, p = 0.03).*
Conclusion: *Local perianal nerve block for hemorrhoidectomy is feasible and safe and superior to spinal block due to a lower incidence of post-op urinary retention and less requirement of parenteral analgesics post-op.*

Keywords: *Hemorrhoidectomy, Hemorrhoid surgery, Perianal nerve block, Spinal anesthesia, Bupivacaine*

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Hemorrhoidectomy may be carried out under several modes of anesthesia. Spinal block and local perianal nerve block have routinely been used for hemorrhoid surgery. Local perianal nerve block technique produces muscle paralysis and loss of sensation in a circumscribed area of the anus by localized effect on peripheral nerve endings and provides full relaxation of the anal canal. The results of hemorrhoid surgery under this mode of anesthesia have been demonstrated in many publications[1-3], but to the authors' knowledge, prospective randomized studies are lacking. The authors undertook a prospective, randomized study to compare local perianal nerve block with spinal block for closed hemorrhoidectomy. The primary end point was analgesic efficacy, safety, patients' satisfaction, postoperative pain, and complications.

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Material and Method

The present study has been reviewed and approved by the institutional review board of Phramongkutklao Hospital, Thailand. Patients who came to the Colorectal Surgical Unit of Phramongkutklao Hospital between December 2006 and November 2007, who had third- or fourth-degree hemorrhoids scheduled for elective hemorrhoidectomy were recruited in the present study. Patients with incarcerated or strangulated hemorrhoids, patients with associated anorectal disease, and with benign prostatic hyper-tro-

phy or bladder neck obstruction were excluded from the present study. The patients eligible to participate in the present study were randomly allocated into two groups (LA or SA) according to the prepared two separate lists of randomized blocks of four. The patients were stratified by gender in order to have as equal a proportion of male and female gender as possible between groups.

The SA group received a subarachnoid block with 0.5% bupivacaine 1.5-2.0 ml. The LA group received a pre-anesthetic intravenous medication-midazolam (dosage: 0.1 mg/kg). Local perianal nerve block was performed by using 0.5% bupivacaine 20 ml diluted with 20 ml sterile water (2.5 mg per ml). Following patient on jackknife position, then a long 25-gauge needle was used for deep infiltration of the anesthetic solution to the perianal region, starting at ischiorectal fossa, just lateral to the anus, bilaterally, and then at the posterior and anterior aspects of the anus. The blockade affected all of the perisphincteric infralevator space and blocked branches from the internal pudendal nerves to the sphincter and anal canal. Some bupivacaine was also infiltrated subcutaneously on the hemorrhoidal pedicle. The Ferguson technique of closed hemorrhoidectomy was used in the present study. In the LA group, the degree of pain experienced during injection of local anesthesia, introduction of proctoscope and during the surgery itself, was graded by patients as mild, moderate, severe or unbearable. No anal packing was used at the end of surgery. All patients were kept lying flat on bed for four hours from the time anesthetic injection was completed. Patients were asked to inform the staff on duty when their first sensation of pain occurred. Then the elapsed time in minutes was calculated and recorded from the time the anesthetic injection was completed to the moment when pain was felt. At 6 and 24 hours post-op pain intensity was measured using visual analogue scale (VAS). Paracetamol (15-20 mg/kg) was given orally every 6 hrs when VAS was ≥ 3. If pain was not relieved one hour after taking paracetamol, the pain rescue medication was pethidine (0.5-1 mg/kg) intramuscular injection every 4 hours. All postoperative complications were recorded. Before discharge, all patients were asked to rate their satisfaction on the anesthetic method by using the verbal rating scale (0-100).

Statistical analysis

All continuous data were tested for normality with Kolmogorov-Smirnov (KS) test. Statistical analysis was performed for comparison between groups with independent t-test (normally distributed variables) or Mann-Whitney U test (non-normally distributed variables) for continuous data. Chi-square test was used for categorical data. Series of univariate analyses to determine the variables associated with postoperative voiding complication were performed. Potentially associated variables were then tested using multivariate logistic regression analysis to adjust for the confounding affects of other factors. A p-value of < 0.05 was considered statistically significant. The relative risk was described by the estimated odds ratio (OR) with a 95 percent confidence interval.

Results

A total of 67 patients satisfied the eligibility criteria for the present study and were randomized to receive either spinal anesthesia (SA group, n = 33) or local perianal block (LA group, n = 34). Mean (SD) age was 41.18 (9.27) years in the SA group and 40.24 (10.66) years in LA group. There were equal numbers of male (LA: SA, 17:17) and almost equal numbers of female (LA: SA, 17:16) in both groups. The main presenting symptoms are described in Table 1.

The patients' pain levels during local anesthetic infiltration, proctoscopy, and surgery are presented in Table 2. There were 33/34 patients with mild or no pain on injection of local anesthetic, only 2/34 patients who underwent proctoscopy, complained of moderate pain and 31/34 patients tolerated surgery with mild or no pain. No patient required conversion to spinal anesthesia.

All LA patients had a successful block for surgery within ten minutes after administering the

Table 1. Patients' demographic data

	Type of anesthesia	
	SA (n = 33)	LA (n = 34)
Age	41.18 (9.27)	40.24 (10.66)
Gender (Male: Female)	17:16	17:17
Severity of hemorrhoids*		
Third degree	39	32
Fourth degree	33	35
Main presenting symptom		
Bleeding	12 (35.3)	12 (36.4)
Mass	20 (58.8)	21 (63.6)
Pain	2 (5.9)	0 (0)

Values are mean (SD) or absolute number (percent)
* Some patients had more than one hemorrhoidal cushion

Table 2. The degree of pain graded by patients during the procedure of local perianal block

	Level of pain (n = 34)				
	None	Mild	Moderate	Severe	Unbearable
Analgesic injection	1	32	1	0	0
Insertion of anoscope	6	26	2	0	0
Surgery	17	14	2	1	0

Table 3. Preoperative and postoperative summary: a comparison between local and spinal anesthesia

	Type of anesthesia		p-value
	SA (n = 33)	LA (n = 34)	
Operative blood loss (ml)	65 (10-220)	52 (10-175)	0.26
Actual time of surgery (min)	34 (16-90)	35 (10-78)	0.99
Duration of analgesic effect (min)	304 (100-650)	205 (15-495)	<0.01*
Number of analgesic pill	6 (2-12)	4 (0-14)	0.14
Number of patients who required analgesic injection			0.03*
1 injection	11 (33.3)	8 (23.5)	
2 injections	6 (18.2)	2 (5.9)	
3 injections	1 (3)	1 (2.9)	
> 3 injections	1 (3)	0 (0)	
Total amount of Intravenous fluid (ml)	1200 (500-1800)	700 (200-1800)	<0.01*

Values are median (min-max) or absolute number (percent)
* Statistically significant

anesthesia. There was no difference in amount of blood loss and duration of surgery between the two groups (Table 3).

Spinal anesthesia had a longer duration of analgesic effect than local perianal block ($p < 0.01$). There was no significant difference in the degree of pain at 6 hours ($p = 0.09$) and at 24 hours after surgery ($p = 0.35$) between the two groups (Table 4). Post-operative requirement of analgesic pills were similar in both groups, while the SA patients required more analgesic injections compared to LA patients ($p = 0.03$) (Table 3).

Five patients (15.2%) in the SA group experienced hypotension (systolic blood pressure decreased more than 30% from baseline) during operation and needed intravenous ephedrine treatment. There was no reported case of hypotension in the LA group. There was a higher rate of voiding problems in spinal anesthesia than local anesthesia ($p = 0.03$). Only 3 patients (8.8%) in the LA group required urinary catheterization compared with 10 patients (30.3%) in the SA group ($p = 0.03$). There were 2/34 (5.9%) of LA patients who experienced postoperative perianal thrombosis (Table 5). One of them underwent surgery for clot evacuation under spinal anesthesia on the day after the initial surgery. There was a high rate of satisfaction on both anesthetic methods as shown in Table 6.

Table 4. Postoperative pain

Pain scale (VAS)	Type of anesthesia		p-value
	SA	LA	
6 hours	50 (0-100)	38 (0-100)	0.09
24 hours	35 (0-78)	31 (0-80)	0.35

Values are median (min-max)

The method of anesthesia was only one independent variable significantly correlated with the occurrence of urinary retention from the multiple

Table 5. Complications

Types of complication	SA (n = 33)	LA (n = 34)	Odds ratio (95%CI)	p-value
Intraoperative hypotention	5 (15.2%)	0 (0%)	-	0.02*
Intraoperative nausea/vomiting	1 (3%)	0 (0%)	-	1.00
Postoperative urinary retention	10 (30.3%)	3 (8.8%)	4.49 (1.1-18.1)	0.03*
Postoperative perianal thrombosis	0 (0%)	2 (5.9%)	-	0.49
Dizziness	1 (3%)	1 (2.9%)	1.03 (0.06-17.2)	1.00
Persistent pain at injection site	1 (3%)	0 (0%)	-	1.00

Table 6. Patients' satisfaction score for the anesthesia

Type of anesthesia	Spinal block	Local perianal block	p-value
Rating of satisfaction (0-100)	90 (80-100)	90 (75-100)	0.57

Values are median (min-max)

Table 7. Comparison of patients with to without voiding problems

Clinical variables	Urinary retention		p-value
	No (n = 54)	Yes (n = 13)	
Age mean(SD)	41.28 (9.64)	38.38 (11.09)	0.35
Sex (Male/Female)	29/25	5/8	0.37
Type of anesthesia (SA/LA)	23/31	10/3	0.03*
Level of pain (6 hours)	39 (0-100)	50 (0-98)	0.29
Operative blood loss (ml)	55 (10-220)	60 (30-124)	0.92
Duration of surgery (min)	32 (10-90)	35 (25-55)	0.29
Number of excised hemorrhoids			
1 head	10 (18.5)	2 (15.4)	0.23
2 heads	31 (57.4)	5 (38.5)	
3 heads	13 (24.1)	6 (46.2)	
Total volume of intravenous fluid mean (SD)	900 (200-1800)	1050 (500-1500)	0.43

Values are median (min-max) or absolute number (percent)
* Statistically significant

logistic regression analysis (Odds ratio = 4.49; 95 percent CI: 1.11-18.19, p = 0.03). The total amount of intravenous fluid, the degree of pain, number of excised hemorrhoids, age, and sex did not affect the occurrence of postoperative voiding problem.

Discussion

In the year 1994, Fleischer M et al[4] conducted a prospective study comparing between local anesthesia and spinal anesthesia for anorectal surgery. Fleischer's study revealed that local anesthesia was superior to spinal anesthesia due to less postoperative pain, meanwhile spinal anesthesia had a significantly greater incidence of urinary retention (32% vs. 9.6%, $p < 0.05$). However, there were only 48 (60%) of the total 80 subjects who underwent hemorrhoidectomy and the results probably were confounded by the difference of surgical procedures and the discrepancy of extent of surgery between both groups.

In order to increase the validity, the present study intended to address and control many known factors influencing the treatment outcomes beforehand such as in the process of randomization. Patients were stratified by gender in order to have an equal propor-

tion of male and female within groups as possible. In addition the randomization procedure in the present study aimed to distribute unknown influencing factors on outcome measurement. Because of the subjective nature of pain, the authors considered the total number of analgesic pills and analgesic injections as an objective assessment of pain in accordance with the visual analogue scale (VAS).

The present study revealed that the local anesthesia was able to provide adequate pain control and adequate relaxation of anal canal for hemorrhoidectomy. A small amount of pain difference during early postoperative period seems unlikely to bear clinical importance from a clinical perspective. However, local anesthesia may not be appropriate for a patient whose mounds of buttocks are high and rise almost straight up from the anal verge. Even under spinal anesthesia, surgery in this type of patient is difficult due to inability to gain adequate exposure. Therefore, local anesthesia should only be done in selected cases.

The reported incidence of urinary retention following hemorrhoidectomy, averaging around 15 percent, has a range from less than one percent to as high as 52 percent of patients[5-9]. The mechanism of urinary retention has not been well established, but the possible explanation is that the postoperative anal pain stimulus activates a sympathetic nerve that causes a bladder outlet obstruction and micturition difficulties[10,11]. Additional explanation is a reduced tension of the detrusor muscle as a result of an intraoperative anal dilatation and the stimulation of the sympathetic nerve caused by pain[12]. Since, hemorrhoidectomy involves the same nerve supply of the anal and urethral sphincter muscles, then urethral spasm reflex or depressed detrusor muscle function could be easily induced after surgery. The incidence of urinary retention that required urinary catheterization in the present study was 8.8% in the LA group which was very much higher than 0.2% in the study of Argov. S and Levandovsky. O[1] which used 20 ml local anesthesia, composed of 0.5% bupivacaine hydrochloride with adrenalin and 2% lidocaine hydrochloride in equal amounts with the addition of some bicarbonate.

The present study revealed that the type of anesthesia was the only factor associated with postoperative urinary retention. Therefore, Local perianal nerve block is a good alternative mode of anesthesia for hemorrhoidectomy because this technique has a high success rate and high patient satisfaction. Patients who underwent hemorrhoidectomy under local perianal nerve block had lower incidence of postoperative voiding problems and required less analgesic injection.

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การศึกษาทางคลินิกแบบสุ่มเปรียบเทียบระหว่างการฉีดยาชาเฉพาะที่และการฉีดยาชาเข้าไขสันหลังในการผ่าตัดริดสีดวงทวารหนักแบบปิด

สหพล อนันต์นำเจริญ, ปิยพันธุ์ ชีรานนท์, ชินกฤต บุญญอัศดร

วัตถุประสงค์: *ศึกษาประสิทธิภาพของการระงับปวด ระดับอาการปวด ผลข้างเคียงต่าง ๆ ภายหลังการผ่าตัด และระดับความพึงพอใจของผู้ป่วย ภายหลัง การผ่าตัดริดสีดวงทวารหนักแบบปิด เปรียบเทียบระหว่างวิธีฉีดยาชาเฉพาะที่บิวพิวาเคนรอบทวารหนัก กับ การฉีดยาชาเข้าช่องไขสันหลัง*

วัสดุและวิธีการ: *ผู้ป่วยจำนวน 67 รายที่เข้ารับการผ่าตัดริดสีดวงทวารหนัก ระหว่างเดือนธันวาคม พ.ศ. 2549 ถึงเดือนพฤศจิกายน พ.ศ. 2550 ได้รับการสุ่มเพื่อให้ยาชาระงับปวดแบบ ฉีดยาชาบิวพิวาเคนเข้าช่องไขสันหลัง (SA) 33 ราย และฉีดยาชาเฉพาะที่รอบทวารหนัก(LA) 34 ราย ทำการวัดระดับอาการปวดที่เวลา 6 และ 24 ชั่วโมงหลังผ่าตัดโดยใช้ visual analogue scale (VAS) บันทึกปริมาณ ยาแก้ปวดที่ได้รับภายใน 24 ชั่วโมงหลังการผ่าตัด ภาวะแทรกซ้อนต่าง ๆ หลังผ่าตัดตลอดจน ประเมินระดับ ความพึงพอใจของผู้ป่วยต่อวิธีการให้ยาชาระงับปวดทั้งสองวิธี*

ผลการศึกษา: *ในผู้ป่วยที่ได้รับการการฉีดยาชาบิวพิวาเคนเข้าช่องไขสันหลังพบว่าเกิดภาวะความดันเลือดต่ำ 5 ราย (15.2%) เปรียบเทียบระดับอาการปวดระหว่าง วิธีฉีดยาชาเฉพาะที่รอบทวารหนัก(LA) กับ การฉีดยาชาเข้าช่องไขสันหลัง (SA) ที่เวลา 6 ชั่วโมง (LA: 39 vs. SA: 50 โดย VAS; p =0.09) และ 24 ชั่วโมง (LA: 31 vs. SA: 35 โดย VAS; p = 0.35) หลังการผ่าตัด ไม่มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ หลังการผ่าตัดกลุ่มผู้ป่วยที่ได้รับการฉีดยาชาเข้าช่องไขสันหลัง ต้องการยาฉีดระงับปวดมากกว่ากลุ่มผู้ป่วยที่ได้รับการฉีดยาชาเฉพาะที่ (p =0.03) และมีปัญหาปัสสาวะไม่ออกและมีปัสสาวะคั่งซึ่งต้องสวนปัสสาวะทิ้งมากกว่ากลุ่มผู้ป่วยที่ได้รับการฉีดยาชาเฉพาะที่รอบทวารหนักอย่างมีนัยสำคัญทางสถิติ (SA: 30.3% vs. LA: 8.8%, p = 0.03)*

สรุป: *การผ่าตัดริดสีดวงทวารหนักโดยการฉีดยาชาบิวพิวาเคนระงับปวดเฉพาะที่เป็นวิธีที่สามารถใช้ได้ค่อนข้างปลอดภัยในทางปฏิบัติ มีข้อได้เปรียบกว่าการการฉีดยาชาเข้าช่องไขสันหลังกล่าวคือพบปัญหาปัสสาวะไม่ออกน้อยกว่า และผู้ป่วยต้องการยาฉีดระงับปวดภายหลังการผ่าตัดน้อยกว่า*