Antibiotics and Early Post Operative Complications of Closed Hemorrhoidectomy: A Retrospective Matched Pair Study

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Objective: *The purpose of the present study was to compare early post-operative complications and length of hospital stay of hemorrhoidectomy patients between those who had and had not received metronidazole perioperatively.*
Research design: *Retrospective, matched pair case-control study.*
Material and Method: *Medical records of all hemorrhoidal patients hospitalized between January 2000 and December 2005 were reviewed. Hemorrhoidectomy patients who had and had not received metronidazole perioperatively during this period were matched based on demographic data. Demographic data including bodyweight and number of hemorrhoidectomies of both groups were collected. Length of hospital stay and immediate post-operative complications (bleeding, urinary retention, and wound dehiscence at 2nd and 4th week), the total dosages of pethidine, acetaminophen, and NSAIDs were analyzed and compared by the McNemar and the Wilcoxon Signed Rank Test.*
Results: *Of 1,184 patients who completed the follow-up protocol, 88 patients (male: female = 31:57) who had received metronidazole could be matched by gender, age, NSAIDs used, number of hemorrhoids resected and operation in the same period with 88 patients (male:female = 31:57) who had not. There were six (6.8%) and seven (8%) patients with urinary retention in the metronidazole group and non-antibiotic group respectively. One patient in each group (1.1%) experienced bleeding that ceased spontaneously. The length of hospital stay was 1.14 $\pm$ 0.35 (ranged 1-2) and 1.11 $\pm$ 0.35 (ranged 1-3) days in the metronidazole and the non-antibiotic group respectively, showing no significant difference (p = 0.683). There was no significant difference in the total dosages of pethidine given postoperatively, which was 1.06 $\pm$ 0.83 and 1.03 $\pm$ 0.78 mg/kg in the metronidazole and the non-antibiotic group respectively (p = 0.747). At the 2nd week, there were two wound dehiscences (2.25%) in each group. At the 4th week, no more new wound dehiscence was detected and all were completely healed without stricture.*
Conclusion: *There was no benefit of metronidazole on closed hemorrhoidectomy with respect to post-operative complications, length of hospital stay, and total analgesics used.*

Keywords: *Hemorrhoid, Hemorrhoidectomy, Wound dehiscence, Metronidazole*

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Many modes of therapy have been advocated for the treatment of symptomatic hemorrhoids including injection sclerotherapy, rubber-band ligation, infrared photocoagulation, bipolar diathermy, and surgical hemorrhoidectomy[1].

Hemorrhoidectomy remains the definitive procedure for treating hemorrhoidal disease[2] and is one of the most commonly performed anorectal operations. However, although it is considered a minor procedure, the post operative course is protracted and the

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postoperative complications such as urinary incontinence, bleeding, wound dehiscence and infection are not negligible[3].

More recently, preoperative and postoperative antibiotics (metronidazole) have been studied to determine their effect on decreasing pain, wound disruption, bacterial colonization and infection of the surgical site[4].

So far, there have been no studies on the effect of metronidazole in closed hemorrhoidectomy. At King Chulalongkorn Memorial Hospital, the authors perform closed hemorrhoidectomy (modified Fansler's technique) under local anesthesia for both urgent and elective operations. In the present study, the authors compared the total dosage of analgesics, length of hospital stay and the post-operative complications between the patients who had and had not received metronidazole in a matched pair case-control fashion.

Material and Method

All patients with the diagnosis of hemorrhoids hospitalized at King Chulalongkorn Memorial Hospital, Bangkok, Thailand from January 2000 to December 2005 were identified through an International Classification of Disease-10 code (ICD-10) search of medical records. The indication for surgery was 3rd or 4th degree hemorrhoids with or without external components. The inclusion criterion was age more than 18 years. The exclusion criteria were pregnancy; perianal infection or fecal incontinence; comorbidity such as cardiac, hepatic, renal, respiratory, and psychologic diseases; allergy to anesthetic drugs; immunocompromised states; inflammatory bowel disease or hematological disorders; use of anticoagulants; concomitant anal disease (fistula, fissure, abscess, Crohn's disease, ulcerative colitis, rectal cancer); and a previous history of anorectal surgery, including previous hemorrhoidectomy or fistula surgery.

Patients with hemorrhoids undergoing urgent and elective hemorrhoidectomy who had and had not received metronidazole during this period were matched and studied by retrospective chart review. Demographic data, the number of hemorrhoidectomies, operative data, length of hospital stay, immediate post-operative complications (bleeding, urinary retention and wound dehiscence at 2nd and 4th week), the total dosage of pethidine, acetaminophen and NSAIDs used were recorded on a data collecting form.

Patients were placed in prone jackknife position. Operations were carried out under local perianal anesthesia by the modified Nivatvongs's technique[5,6] with 0.5% xylocaine and adrenaline 40 ml (1% xylocaine with adrenaline 20 ml plus sterile water 20 ml), each 10 ml was slowly injected at 3, 6, 9 and 12 o'clock. Shaftless Fansler's anoscope, external diameter 3.2 cm was inserted to expose the anal canal. Hemorrhoidal tissue was excised with Metzenbaum scissors, starting perianally, dissecting into the anal canal and removing the whole hemorrhoidal plexus and completely closed with vicryl 4-0 in rapid, continuous fashion. With this technique, the internal sphincter was saved because the large size anoscope stretched the sphincter and the tissue was always cut just superficial to the internal sphincter, the resection was limited to the working area of the anoscope and allowed safe approximation. Procedures were performed by colorectal staff and fellows.

Post-operative analgesia was achieved with oral acetaminophen, NSAIDs and pethidine intramuscularly as requested. Metronidazole, 500 mg three times a day, was given to patients in the antibiotic group for 7 days after using the surgery. Patients were advised to clean the wound with running water after toilet and to wear a sanitary pad. Follow-up was scheduled at the 2nd and 4th week after operation.

Definitions

Urinary retention: Full urinary bladder requiring urinary catheterization.

Bleeding: Continued or massive bleeding requiring surgical intervention, blood transfusion or hospital readmission.

Infection: Post-operative local abscess, cellulitis, sepsis that required antibiotics or surgical treatment.

Wound dehiscence: Wound disruption wider than 2 mm.

Statistical analysis

Data were collected and analyzed with statistical software (SPSS version 13.0, SPSS inc., Chicago, IL). Continuous or ordinal variables were summarized as mean $\pm$ standard deviation and range. Categorical variables were summarized as number and percentages. Comparisons between variables were carried out using the McNemar and the Wilcoxon Signed Rank Test. For all comparisons, statistical significance was defined as a p-value of less than 0.05 or less.

Results

From January 2000 to December 2005, 88 patients (male:female = 31:57) who had received metron-

idazole and 88 matched patients in the non-antibiotic group were enrolled in the present study. There were 62 men and 114 women; the mean age ± standard deviation was 51.9 ± 13.3 (range 27-82) years (Table 1). All patients in both groups had symptomatic grade three or four hemorrhoids with skin tags or combined hemorrhoids and underwent elective or emergency hemorrhoidectomy. There was no difference in the demographic data between the two groups, six (6.8%) and seven (8%) patients experienced urinary retention in the metronidazole and the non-antibiotic groups respectively. One patient in each group (1.1%) had post-operative bleeding that ceased spontaneously (Table 2). The total dosages of pethidine given to the patients were not significantly different between the two groups, which were 1.06 ± 0.83 and 1.03 ± 0.78 mg/kg in the metronidazole and the non-antibiotic groups respectively (p = 0.747) (Table 3).

At the 2nd week, there were two wound dehiscences (2.25%) in each group. At the 4th week, no more new wound dehiscence was detected and all wounds were completely healed. There was no significant difference in all complications (urinary retention, bleeding, wound dehiscence at the 2nd and 4th week) between the two groups. The aim of the present study was to evaluate the short-term outcomes; long-term outcomes will not be discussed. The length of hospital stay was 1.14 ± 0.35 (ranged 1-2) and 1.11 ± 0.35 (ranged 1-3)

Table 1. Demographic data

	Metronidazole (n = 88)	Non-antibiotic (n = 88)	p-value
Sex (male : female)	31:57	31:57	0.999
Emergency : Elective	13:75	13:75	0.999
NSAIDS : non-NSAIDs	32:56	32:56	0.999
Age (years) (mean ± SD)	51.9±13.3	51.9±13.3	0.999
Number of hemorrhoids resected (mean ± SD)	2.42±1.04 (range 1-5)	2.19±0.91 (range 1-4)	0.116
Bodyweight (kilograms) (mean ± SD)	63.98±10.14 (range 45-80)	65.07±10.28 (range 43-80)	0.642

Table 2. Post-operative complications

	Metronidazole (n = 88) (%)	Non-antibiotic (n = 88) (%)	p-value
Urinary retention	6 (6.8%)	7 (8%)	0.999
Bleeding	1 (1.1%)	1 (1.1%)	0.999
Wound dehiscence at the 2nd week*	2 (2.25%)	2 (2.25%)	0.999

* During the 4th week, no more new wound dehiscence was detected and all wounds were completely healed

Table 3. Post-operative analgesics and length of hospital stay

	Metronidazole (mean ± SD)	Non-antibiotic (mean ± SD)	p-value
Pethidine (mg/kg)	1.06±0.83	1.03±0.78	0.747
Acetaminophen (tablets)	5.61±1.13 (range 4-8)	5.70±1.23 (range 4-8)	0.606
Length of hospital stay (days)	1.14±0.35 (range 1-2)	1.11±0.35 (range 1-3)	0.683

days in the metronidazole and the non-antibiotic groups respectively, showing no significant difference ($p = 0.683$).

Discussion

The single most important challenge after surgical hemorrhoidectomy is the management of post-operative pain. Post-operative pain likely comprises of two major components: first, discomfort from the surgical incision and tension in the uniquely sensitive anoderm and perianal skin; and second, discomfort from tissue inflammation resulting from bacterial infiltration of the wound. Prevention of bacterial colonization of the hemorrhoidectomy site has received little attention.

The bacterium most commonly identified was *Escherichia coli*, followed by *Staphylococcus aureus* and *Staphylococcus epidermidis*. *Pseudomonas aeruginosa*, *Enterococcus faecalis*, *Klebsiella pneumoniae*, *Proteus vulgaris*, and *Proteus mirabilis* have also been identified[7]. Brook[8] retrospectively studied by pus aspiration from infected hemorrhoids in 19 patients with infected hemorrhoidectomy wounds. Anaerobic bacteria only were recovered in six (32%) specimens, aerobic bacteria only in one (5%), and mixed aerobic and anaerobic bacteria in 12 (63%). Sixty-eight isolates were recovered: 39 anaerobes (2.1 isolates per specimen) and 29 aerobes (1.5 per specimen). The predominant anaerobes were *Bacteroides* spp. (13 isolates, including 10 *Bacteroides fragilis* groups) and 13 *Peptostreptococcus* spp. The predominant aerobes were *Escherichia coli* (7), *Proteus* spp. (5), group D *streptococci* (4), and *Pseudomonas* spp. (3).

Metronidazole has been shown to reduce post-operative pain on days 5, 6, and 7 after open (Milligan-Morgan) hemorrhoidectomy. This is thought to be because of the prevention of secondary infection of the wounds. However, wound dehiscence secondary to infection may occur after the closed technique, which would reduce the proposed benefit of wound closure[9].

In the present study, there were no significant differences in any complications (urinary retention, bleeding, wound dehiscence at the 2nd and 4th week) after closed hemorrhoidectomy. The total dosages of pethidine, acetaminophen and NSAIDs given to the patients also showed no significant difference between the two groups. The reason for these results may be that the wound edges are sutured in closed hemorrhoidectomy, which facilitates more rapid healing and may cause less pain than open hemorrhoidectomy[10,11]. Therefore, the antibiotics might not decrease painful sensation, analgesics, urinary retention, wound infection and dehiscence, and length of hospital stay significantly. Another reason may be that the sample size and hence the number of outcomes of interest were too small for the differences to be statistically significant.

Conclusion

In the present study, prophylactic antibiotics do not seem to have an effect on closed hemorrhoidectomy in terms of post operative complications, length of hospital stay, and total analgesics used. However, the effect of antibiotics on post operative complications should be further studied in a large, randomized control trial.

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ยาปฏิชีวนะกับผลการผ่าตัดริดสีดวงทวารและภาวะแทรกซ้อนเบื้องต้น

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***วัตถุประสงค์**: เพื่อศึกษาและเปรียบเทียบผลการรักษา ภาวะแทรกซ้อนเบื้องต้นและระยะเวลาในการรักษาตัวในโรงพยาบาลของผู้ป่วยที่ได้รับการทำผ่าตัดริดสีดวงทวาร ระหว่างกลุ่มผู้ป่วยที่ได้และไม่ได้รับยาปฏิชีวนะ metronidazole*

***รูปแบบการศึกษา**: การศึกษาย้อนหลังโดยการเปรียบเทียบข้อมูลแบบจับคู่*

***วัสดุและวิธีการ**: ศึกษาจากประวัติผู้ป่วยในที่ได้รับการวินิจฉัยว่าเป็นโรคริดสีดวงทวารและได้รับการทำผ่าตัดทั้งแบบฉุกเฉินและมาผ่าตัดตามตารางปกติ ในโรงพยาบาลจุฬาลงกรณ์ตั้งแต่เดือนมกราคม พ.ศ. 2543 ถึง เดือนธันวาคม พ.ศ. 2548 โดยจับคู่ข้อมูลผู้ป่วยระหว่างกลุ่มที่ได้และไม่ได้รับยาปฏิชีวนะได้แก่เพศ อายุ น้ำหนัก จำนวนหัวริดสีดวงทวารที่ได้รับการผ่าตัดและช่วงระยะเวลาที่ทำการทำผ่าตัด หลังจากนั้นนำข้อมูลทั้ง 2 ชุดมาเปรียบเทียบกันในด้านผลการรักษา ระยะเวลาในการรักษาตัวในโรงพยาบาลและภาวะแทรกซ้อนเบื้องต้น เช่น แผลมีเลือดออก ภาวะปัสสาวะคั่ง และแผลแยกที่ช่วง 2 และ 4 สัปดาห์ จำนวนยาบรรเทาอาการปวดที่ได้รับ*

***ผลการศึกษา**: ในช่วงระยะเวลาที่ศึกษามีผู้ป่วยได้รับการวินิจฉัยว่าเป็นโรคริดสีดวงทวารและได้รับการทำผ่าตัดทั้งแบบฉุกเฉินและมาผ่าตัดตามตารางปกติ 1,440 ราย ผู้ป่วยที่มาตรวจติดตามหลังการผ่าตัดที่ 2 และ 4 สัปดาห์ มี 1,184 ราย ในจำนวนนี้มีผู้ป่วยที่ได้รับยาปฏิชีวนะ metronidazole 88 ราย (ชาย:หญิง = 31:57) และอีก 88 ราย ไม่ได้รับ (ชาย:หญิง = 31:57) ที่สามารถจับคู่ข้อมูลที่มีเพศ อายุ น้ำหนัก จำนวนหัวริดสีดวงทวารที่ได้รับการผ่าตัดและช่วงระยะเวลาที่ทำการทำผ่าตัดตรงกัน อายุเฉลี่ยเท่ากันทั้ง 2 กลุ่มคือ 51.9 $\pm$ 13.3 ปี ได้รับการทำผ่าตัดทั้งแบบฉุกเฉิน 13 รายและมาผ่าตัดตามตารางปกติ 75 รายในแต่ละกลุ่มพบภาวะปัสสาวะคั่งในกลุ่มผู้ป่วยที่ได้ยาปฏิชีวนะ 6 ราย และกลุ่มผู้ป่วยที่ไม่ได้รับยาปฏิชีวนะ 7 ราย พบแผลมีเลือดออกหลังผ่าตัดกลุ่มละ 1 รายแต่สามารถหยุดได้เอง ระยะเวลาในการรักษาตัวในโรงพยาบาลเท่ากับ 1.14 $\pm$ 0.35 และ1.11 $\pm$ 0.35 วันและปริมาณยาแก้ปวด pethidine ที่ได้รับเท่ากับ 1.06 $\pm$ 0.83 และ1.03 $\pm$ 0.78 มิลลิกรัมต่อน้ำหนักตัว 1 กิโลกรัม ในกลุ่มที่ได้และไม่ได้รับยาปฏิชีวนะ ตามลำดับ ซึ่งไม่มีความแตกต่างอย่างมีนัยสำคัญทางสถิติ การตรวจติดตามหลังการผ่าตัดที่ 2 สัปดาห์ พบว่าผู้ป่วยมีแผลแยกกลุ่มละ 2 ราย ซึ่งเมื่อติดตามไปถึง 4 สัปดาห์ พบว่าผู้ป่วยทั้ง 4 ราย แผลหายสนิท และไม่พบแผลแยกในผู้ป่วยรายอื่นอีก*

***สรุป**: ยาปฏิชีวนะ metronidazole ไม่มีผลต่อผลการรักษา ภาวะแทรกซ้อนเบื้องต้น ปริมาณยาบรรเทาอาการปวดที่ได้รับ และระยะเวลาในการรักษาตัวในโรงพยาบาลของผู้ป่วยที่ได้รับการทำผ่าตัดริดสีดวงทวาร*