

Comparison of the Rhomboid Fasciocutaneous Transposition Flap with Primary Simple Closure in the Treatment of Uncomplicated Pilonidal Disease

SV Hosseini¹, M Aghebati², A Rezaianzadeh^{1,3*}

1. Gastroenterohepatology Research Center, Department of Colorectal Surgery,
2. Department of Surgery,
3. Department of Epidemiology, School of Public Health, Shiraz University of Medical Science, Shiraz, Iran.

ABSTRACT

BACKGROUND

Pilonidal disease is a common condition that affects younger people in which over half of the affected patients present with a sacrococcygeal abscess. This study was performed to compare the outcome of excision and primary closure with that of rhomboid excision and flap procedure in patients with uncomplicated pilonidal disease.

METHODS

A total of 90 consecutive patients with pilonidal disease were randomly divided into: group 1 who underwent the rhomboid fasciocutaneous transposition flap procedure (n=45) and group 2 who underwent excision and primary closure (n=45). Length of hospital stay and postoperative complications, which included surgical site infection, seroma and hematoma, as well as the time to resumption of work and early recurrence were compared for all patients.

RESULTS

Duration of hospital stay ($p<0.001$) and time to resumption of work ($p<0.001$) was less for group 1. During a median follow-up of 12 months, no recurrence was detected in patients in group 1 whereas six patients developed recurrence in group 2 ($p=0.013$).

CONCLUSION

Rhomboid fasciocutaneous transposition flap procedure, with its acceptable long-term results and shorter hospital stay, is preferable to simple excision and primary closure in the treatment of uncomplicated pilonidal disease.

KEYWORDS

Pilonidal disease; Simple closure; Rhomboid flap

* Corresponding Author:

Abbas Rezaianzadeh, MD
 Assistant Professor of Gastroentero-
 hepatology Research Center,
 Department of Epidemiology, School
 of Public Health, Shiraz University of
 Medical Sciences, Shiraz, Iran.
 E-mail: rezaina@sums.ac.ir
 Tel: +98 711 6474263
 Fax: +98 711 6474263
 Received: 28 November 2008
 Accepted: 1 April 2009

INTRODUCTION

Pilonidal disease is a common condition that affects younger people which causes discomfort that may interfere with education or employment, sometimes for prolonged periods.

The etiology is uncertain, but is related to the implantation of loose hair into the depth of the natal crease. The affecting factors are the nature of the hair itself, the force of implantation and the vulnerability of the skin.¹

More than half of the affected patients present with sacrococcygeal abscess. A number of surgical treatment options exist, including: simple incision and drainage, lying open, marsupialization, excision and primary closure, or rhomboid excision and the Limberg flap procedure.²⁻⁵

Simple excisional techniques are associated with high morbidity and recurrence related to the continuing presence of the natal cleft.

Recurrence rates of 7-42% have been reported following excision and primary closure,^{6,7} while a number of studies have reported a recurrence rate of 0-3% after rhomboid excision and Limberg flap repair.⁸⁻¹¹

However, there have been few randomized clinical studies to compare the rhomboid fasciocutaneous transposition flap procedure with other conventional procedures in the treatment of uncomplicated pilonidal disease. The aim of this study was to perform a randomized clinical trial to compare the rhomboid fasciocutaneous transposition flap procedure with excision and primary closure in the treatment of uncomplicated pilonidal disease.

MATERIALS AND METHODS

From March 2007 to March 2008, 90 patients with symptomatic uncomplicated pilonidal disease were enrolled. Patients with malnutrition, immune suppression, current chemotherapy and steroid therapy treatments, metabolic diseases including diabetes mellitus, infected pilonidal sinuses, and those who had undergone a previous surgery were excluded from the study.

The study was approved by the Shiraz University Ethics Committee. After obtaining written informed consent, patients were randomly allocated to undergo either the rhomboid fasciocutaneous transposition flap procedure (group 1, n=45) or excision and primary closure (group 2, n=45) by means of a computer-generated table of random numbers.

The randomization was carried out by an independent computer consultant. All patients were operated under general anesthesia. The operative field was shaved and cleaned with antiseptic povidone-iodine solution. In group 1, the lesion was excised

with a vertical elliptic incision to the level of the sacrococcygeal fascia. After the placement of deep 0 polyglactin sutures (Vicryl; SUPA, Tehran, Iran), the subcutaneous tissue was approximated with 3/0 polyglactin interrupted subcutaneous sutures (Vicryl; SUPA, Tehran, Iran) and the skin edges were closed with 3/0 polypropylene interrupted mattress sutures (Propilen; SUPA, Tehran, Iran). In group 2, as Figure 1 shows, the lesion was excised with a rhomboid-shaped incision with each side equal in length. After extension of line cb and axis db, line be was created equidistantly between lines bc and bd, with a length equal to the sides of the rhomboid excision.



Fig. 1: Rhomboid fasciocutaneous transposition flap.

Line ef was drawn parallel to the ac axis, and was also of the same length. The depth of the rhomboid excision was extended to the gluteal fascia at lines be and ef. The rhomboid flap (cbef) was then rotated from the gluteal fascia to the excised area (abcd) without tension. Subcutaneous tissue and the skin were sutured separately with interrupted sutures.

At the end of the procedure, a closed suction drain was inserted. Methylene blue was not used to identify the tracks in either group. A single dose of prophylaxis antibiotic was used immediately prior to the incision. Postoperative wound care that included regular shaving of the operative field and hygienic measures was performed for all patients.

Skin sutures were removed on the tenth postoperative day. Length of hospital stay, duration of inability to work, postoperative complications (infection, seroma, and hematoma) and postoperative recurrence were recorded. When the drain was removed and intramuscular analgesia was not needed, the patients were discharged from the hospital. Duration of inability to work was defined as the time from the date of surgery to the date on which the patient returned to normal activities, including employment and leisure activities.

A questionnaire was used to assess the duration of recovery. The patients were visited one week and one month after surgery, and then each three months for at least 23 months during the follow-up period.

The incidence of recurrence was recorded. All statistical analyses were performed with the Statistical Package for Social Sciences version 15.0 (SPSS Inc., Chicago, IL, USA). The results were expressed as mean value \pm standard deviation. The

chi-square or Fisher's exact test was applied for comparison between frequencies. All tests were two-sided. The level of significance was set at $p < 0.05$.

RESULTS

Group 1 consisted of 41 male and 4 female patients with a mean age of 24 years (range=16-32 years), and group 2 consisted of 39 male and 6 female patients whose mean age was 23.6 years (range=17-34 years).

Table 1: Comparison between two study groups regarding demographic and surgical findings.

	Group 1 (n=45)	Group 2 (n=45)	p-value
Age	24.3 \pm 3.9	23.6 \pm 3.5	0.692
Male: Female ratio	41:4	39:6	0.370
Surgical site infection	1 (2.2%)	5 (11.1%)	0.101
Seroma	1 (2.2%)	2 (4.4%)	0.51
Early recurrence	0 (0.0%)	6 (13.3%)	0.013
Duration of healing	8.16 \pm 0.36	12.9 \pm 1.2	<0.001
Duration of hospital stay	1.53 \pm 0.5	3.21 \pm 0.8	<0.001
Duration of inability to work	11.7 \pm 0.7	18.6 \pm 1.4	<0.001

No patient was lost to follow-up and all patients were evaluated. There were no significant differences between the two groups with respect to age and sex ($p=0.370$, $p=0.692$ respectively; Table 1). An infection at the surgical site was observed in one (2.2%) patient in group 1 and in five (11.1%) patients in group 2 ($p=0.101$). One patient (2.2%) in group 1 and two patients (4.4%) in group 2 developed seroma ($p=0.51$).

None of the patients in group 1 developed recurrence while recurrence was seen in six patients (13.3%) in group 2 ($p=0.013$). The mean duration of healing was 8.16 (8-9) days in group 1 and 12.9 (12-14) days in group 2 ($p < 0.001$).

The median duration of hospital stay was longer in group 2 ($p < 0.001$). The median duration of inability to work was 11.7 (8-12) days in group 1 and 18.6 (15-20) days in group 2 ($p < 0.001$).

DISCUSSION

The main purpose of treatment for pilonidal disease is to provide a high chance for cure with minimal discomfort as well as low complication and recurrence rates, while at the same time avoiding a prolonged hospital stay and ensuring a short

duration of inability to work.¹²

Surgical therapy combines excision of the sinus tracts with or without marsupialization, primary closure or rhomboid fascioutaneous transposition flap procedure. Eryilmaz et al.¹⁰ advocated the rhomboid fasciocutaneous transposition flap procedure, especially in patients with recurrent or extensive disease. In spite of the disadvantages related to an unfavorable cosmetic appearance following the rhomboid fasciocutaneous transposition flap closure; the low recurrence rates, shorter hospital stay and faster return to work are preferable outcomes for this procedure.

Postoperative complications include wound infection and seroma in patients undergoing the rhomboid fasciocutaneous transposition flap procedure and do not differ from those who undergo simple closure.

A wound infection rate of 1.5-6% has been reported in different studies,¹⁰⁻¹³ and in the present study the infection rate was 2.2% in group 1 and 11.1% in group 2. Lee et al.² have reported a 10% rate of wound dehiscence. In this study, the duration of hospital stay was shorter in patients treated with the rhomboid fasciocutaneous transposition flap procedure,

in keeping with the findings of both Urhan et al.¹⁴ and Bozkurt and Tezel,¹⁵ who have reported the mean length of hospital stay as 3.7 and 4.1 days, and the mean time to return to normal activity as 7 and 17.5 days, respectively.

In contrast, excision and primary closure includes prolonged wound healing and delays return to work. Our results confirmed a significantly shorter time to return to work in individuals treated with the rhomboid fasciocutaneous transposition flap.¹⁶

Akca et al. found less postoperative pain, earlier mobilization, shorter duration of hospital stay and time to resumption of work along with fewer postoperative complications in patients undergoing the Limberg flap procedure when compared to those who underwent simple closure.¹⁶ Recurrence after therapy of pilonidal disease is usually noticed within the first three years.¹⁶⁻¹⁸

The present study indicates that recurrence may be minimized with the rhomboid fasciocutaneous transposition flap. No recurrence has been observed in group 1, whereas the recurrence rate was 13.3% in group 2. Other authors have reported recurrence rates of 0-3% with the rhomboid fasciocutaneous transposition flap.¹¹

We have previously shown a lower recurrence rate in those who underwent drainage and primary wound closure as compared to the excision and secondary wound healing in complicated pilonidal disease.¹⁹ In conclusion, the rhomboid fasciocutaneous transposition flap procedure, with its acceptable long-term results and shorter hospital stay is preferable to simple excision and primary closure in the treatment of uncomplicated pilonidal disease.

ACKNOWLEDGMENT

We wish to thank the Gastroenterohepatology Research Center for their cooperation.

CONFLICT OF INTEREST

None declared.

REFERENCES

- Karydakos GE. Easy and successful treatment of pilonidal sinus after explanation of its causative process. *Aust N Z J Surg* 1992;**62**(5):385-9.
- Lee HC, Ho YH, Seow CF, Eu KW, Nyam D. Pilonidal disease in Singapore: clinical features and management. *Aust N Z J Surg* 2000;**70**:196-8.
- Manterola C, Barroso M, Araya JC, Fonseca L. Pilonidal disease: 25 cases treated by the Dufourmentel technique. *Dis Colon Rectum* 1991;**34**(8):649-52.
- Morell V, Charlton BL, Deshmukh N. Surgical treatment of pilonidal disease: comparison of three different methods in fifty-nine cases. *Mil Med* 1991;**156**:144-6.
- al-Hassan HK, Francis IM, Neglen P. Primary closure or secondary granulation after excision of pilonidal sinus? *Acta Chir Scand* 1990;**156**(3):695-9.
- Sondenaa K, Nesvik I, Andersen E, Natas O, Soreide JA. Bacteriology and complications of chronic pilonidal sinus treated with excision and primary suture. *Int J Colorectal Dis* 1995;**10**:161-6.
- Iesalniaks I, Furst A, Rentsch M, Jauch KW. Primary mid-line closure after excision of a pilonidal sinus is associated with a high recurrence rate. *Chirurg* 2003;**74**(5):461-68.
- Azab AS, Kamal MS, el Bassyoni F. The rationale of using the rhomboid fasciocutaneous transposition flap for the radical cure of pilonidal sinus. *J Dermatol Surg Oncol* 1986;**12**(12):1295-9.
- Mentes BB, Leventoglu S, Cihan A, Tatlicioglu E, Akin M, Oguz M. Modified Limberg transposition flap for sacrococcygeal pilonidal sinus. *Surg Today* 2004;**34**(5):419-23.
- Eryilmaz R, Sahin M, Alimoglu O, Dasiran F. Surgical treatment of sacrococcygeal pilonidal sinus with the Limberg transposition flap. *Surgery* 2003;**134**(5):745-9.
- Kapan M, Kapan S, Pekmezci S, Durgun V. Sacrococcygeal pilonidal sinus disease with Limberg flap repair. *Tech Coloproctol* 2002;**6**(1):27-32.
- Allen-Mersh TG. Pilonidal sinus; finding the right track for treatment. *Br J Surg* 1990;**77**(2):123-32.
- Topgul K, Ozdemir E, Kilic K, Gokbayir H, Ferahkose Z. Long-term results of Limberg flap procedure for treatment of pilonidal sinus: a report of 200 cases. *Dis Colon Rectum* 2003;**46**(11):1545-8.
- Urhan MK, Kucukel F, Topgul K, Ozer I, Sari S. Rhomboid excision and Limberg flap for managing pilonidal sinus: results of 102 cases. *Dis Colon Rectum* 2002;**45**(5):656-9.
- Bozkurt MK, Tezel E. Management of pilonidal sinus with the Limberg flap. *Dis Colon Rectum* 1998;**41**(6):775-7.
- Akca T, Colak T, Ustunsoy B, Kanik A, Aydin S. Randomized clinical trial comparing primary closure with the Limberg flap in the treatment of primary sacrococcygeal pilonidal disease. *Br J Surg* 2005;**92**(9):1081-4.
- Kronborg O, Christensen K, Zimmermann-Nielsen C. Chronic pilonidal disease: a randomized trial with a complete 3-year follow-up. *Br J Surg* 1985;**72**(4):303-4.
- Aydede H, Erhan Y, Sakarya A, Kumkumoglu Y. Comparison of three methods in surgical treatment of pilonidal disease. *Aust N Z J Surg* 2001;**71**(6):362-4.
- Hosseini SV, Bananzadeh AM, Rivaz M, Sabet B, Mosallae M, Pourahmad S, et al. The comparison between drainage, delayed excision and primary closure with excision and secondary healing in management of pilonidal abscess. *Int J Surg* 2006;**4**(4):228-31.