ORIGINAL ARTICLE

Rhomboid excision with Limberg Flap a novel treatment for Sacrococcygeal Pilonidal Sinus

FAISAL SHABIR, BAHZAD AKRAM KHAN, MUHAMMAD AZEEM MIAN

ABSTRACT

Background: Pilonidal sinus is a disease of young adults having single or multiple blind tracks lined by granulation tissue containing tuft of shed hair. Natal cleft is the commonest site; rarely involves umbilicus, axilla and inter-digital cleft. It has various methods of its treatment. The modalities of treatment vary from conservative medical management to complex surgical procedures.
Aim: To study the outcome of Rhomboid excision and Limberg's flap closure for the treatment of Sacrococcygeal Pilonidal sinus.
Methods: A total of 60 patients of pilonidal sinuses were selected for this study. After initial workup, they were operated under general anesthesia in prone position by Rhomboid excision and Limberg's flap technique with a closed suction drain and were followed up for next twelve months (after one week, two weeks, six months and twelve months) for surgical complications of the treatment (like flap edema, postoperative infection, wound dehiscence) and duration of hospital stay.
Results: The infection rates were observed to be 10% in Limberg's flap and 26.6% in primary closure group. Whereas the recurrence rate were only 3.3% in Limberg's flap as compared to 13.3% in primary closure group. Because of its low complication rate and acceptable long term results, rhomboid excision and the Limberg's flap procedure is preferable to simple excision and primary closure in the treatment of sacrococcygeal pilonidal disease.
Conclusion: The Limberg's flap procedure is an easy and effective technique. Patient comfort, quick healing time, short hospital stay, early return to full activity, and low complication and recurrence rates are the important advantages of this procedure.
Keywords: Pilonidal sinus, Primary closure, Rhomboid excision, Limberg's flap

INTRODUCTION

A sinus is a channel often allowing drainage of fluid or pus. Pilonidal sinus arises from chronic inflammation and pressure involving a hair-bearing region. A tract develops connecting the skin surface with a collection of hairs, cell debris and keratinizing epithelial tissue.

The disease more commonly affects the young adults between 17-38 years of age[1]. It causes discomfort that may interfere with daily life or employment, sometimes for prolonged periods. The etiology is uncertain, but relates to the implantation of loose hair in to the depth of the natal cleft. Factors that influence this are the nature of the hair itself, the force of implantation and the vulnerability of the skin. So the obese individuals having deeper intergluteal grooves and with excessive hair are found to be more affected[2,3]. It appears most frequently in the Sacrococcygeal (natal cleft) region. However, rarely it may be located in the axilla, umbilicus, pubis, intermammarian region, scalp, ear, amputation stumps, genital tracts of both men and women, interdigital webs of hairdressers, and hands of farmers who shear sheep[4].

Patients present with pain, swelling and discharge when these sinuses become infected[5]. Despite surgical therapy, dating back more than a century, management remains controversial. The management of pilonidal sinus is frequently unsatisfactory. No current method satisfies all the necessary requirements for the ideal treatment, namely rapid healing, no hospital admission, minimal patient inconvenience, and low recurrence.

Conservative non-operative management, closed methods, laying open of the track, wide excision and open drainage, wide excision and primary closure, and limited excision, are the methods currently used[6]. Simple excisional techniques are associated with high morbidity and recurrence owing to the continuing presence of the natal cleft. Recurrence rates of 7–42 percent have been reported following excision and primary closure[7,8].. Studies have shown that Rhomboid excision and Limberg's flap closure can be performed for managing primary or recurrent pilonidal sinus with a low complication rate, short hospital stay, short time to return to normal activity, and good long-term results[9].

Department of Surgery, Mayo Hospital, Lahore
Correspondence to Dr. Faisal Shabbir, Senior Registrar
Email: sdrfaisal@yahoo.com

The majority of procedures for treatment can be classified in one of the four categories 1. incision and drainage, 2. Excision and healing by secondary intention 3. excision and primary closure and 4. excision with reconstructive flap techniques.

Limberg's procedure: A rhombus is classically defined as an oblique-angled equilateral parallelogram, whereas a rhomboid differs in that it has uneven adjacent sides. Transposition flaps are useful when the size or shape of a lesion does not permit direct closure using a standard fusiform incision. The technique of skin flap elevation is simple. The elevated flap requires sufficient subcutaneous fat, and dissection must be carried past its base to prevent an elevated bump when it is transposed. Rhomboid (Limberg) flap, single or multiple, can be applied widely with extreme safety and good cosmetic results. After successful flap design and implementation, monitor the flap for viability as early recognition of ischemia is important in preventing subsequent flap necrosis, thus flap failure. Assessment of bleeding from the flap after stabbing it with a small needle is believed to be one of the most reliable methods of clinical assessment[10].

The objective of the study was to observe outcome of Rhomboid excision and Limberg's flap closure for treatment of Sacrococcygeal Pilonidal sinus in terms of complication rates, hospital stay, time to return to normal activity, infection, recurrence and good long-term results.

METHODOLOGY

This study was conducted at Surgical Department of Mayo Hospital Lahore that is a tertiary care teaching institute affiliated with King Edward Medical University, Lahore. Duration of study was three years from 2009 to 2012. A total of 30 patients were included in the study. Patients with sacrococcygeal pilonidal sinus with age of more than 13 years were included in the study. Patients with recurrent pilonidal sinus were excluded from the study. Study hypothesis was local transpositional Limberg flap closure in the treatment of sacrococcygeal pilonidal disease is superior to other treatment modalities. Patients were admitted through outpatient department and a detailed data was noted including demographic information like name, age, sex, weight, socioeconomic status and profession. The patients were asked about the symptoms, duration and severity and examined for the level of the problem and any previous surgical treatment for pilonidal sinus. Data was collected on a Proforma. After initial workup, they all were operated under general anesthesia in prone position. Patients were followed up for next twelve months (after one week, two weeks, six months and twelve months) for surgical complications of the treatment (like flap edema, postoperative infection, wound dehiscence), duration of hospital stay, duration of postoperative drain and return (the post operative day) to normal physiology. All this information was collected through a specially designed proforma. Data was analyzed by entering the data in SPSS version 17.

RESULTS

Thirty patients of sacrococcygeal pilonidal disease were included. The patients shown in table were divided in three age groups. The first age group had patients of 18-30 years 27(90%), in the second had ages between 31-40 years 2(6.7%, and in the third group, patients aged 41-50 years 1(3.3%). The patients included in this study were 27 males (90%) and 3 females (10%). The male to female ratios were 9:1.

The presenting complaints, frequencies and percentages are shown in table 1. There were discharging sinuses reported in 23 patients (76.7%), 3 patients (10%) complained of swelling and 4 patients (13.3%) had pain. One patient was smoker (3.3%) and 7 patients were obese (23.3%).

Table 1: Frequency distribution of patients according to presenting complaints (n = 30)

Presenting complaints	n	%age
Discharging sinus	23	76.7
Swelling	3	10.0
Pain	4	13.3

According to local findings, 4 patients (13.3%) had redness, 3 patients (10%) had swelling, 30 patients (100%) had discharge (purulent), 26 patients (86.7%) had tuft of hairs, 27 patients (90%) had multiple number of tracts and 25 patients (83.3%) had multiple external openings were noted in modified Limberg's flap procedure as shown in table-2 . In subjects who underwent modified Limberg's procedure there were 2 patients (6.6%) who had infection and 1 patient (3.3%) had recurrence. The mean hospital stay was 1.63 days after Limberg's flap procedure. Average time period for return to work was 13.4 days.

Table 2: Frequency distribution of patients according to local findings (n = 30)

Local finding	n	%age
Redness	4	13.3
Swelling	3	10.0
Purulent discharge	30	100.0
Tuft of hairs	26	86.7
Multiple tracks	27	90.0
Multiple external openings	25	83.3

Fig. 1-A: Limberg's flap

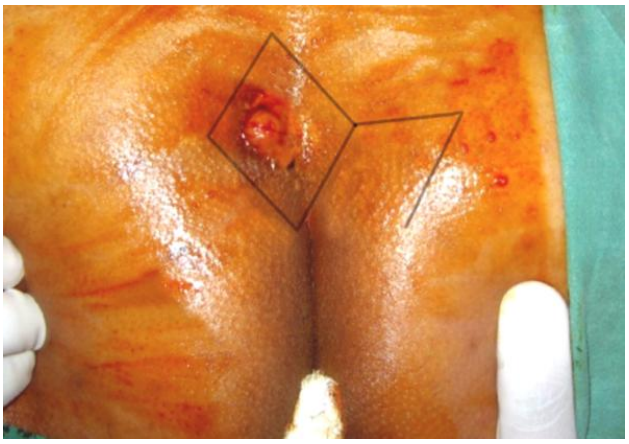

Fig. 1-B: Transposition of flap

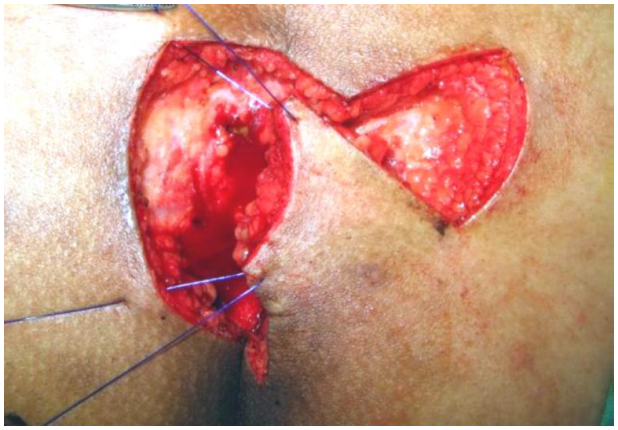

Fig. 1-C: Final view of Limberg's flap

DISCUSSION

In this study, all the patients were less than 40 years of age except one. Mean ages were 23.5 years. It is postulated that the disease is related with male sex hormones, therefore, a disease of young male[11]. Nevertheless, some studies have shown age more than 40 years[12,13].

Male to female ratio, in different studies has been observed as follows; Bukhari et al, 12.3:1 in Limberg's flap and 13.8:1 in primary closure and Saleem and Al-Hashimi, 11:1 in Limberg's flap and 13.2:1 in primary closure[14,15]. Whereas, in the present study the ratio is 14.1:1 in primary closure, which is comparable with other studies. In this study the complications included wound infection in 6.6% cases reported and recurrence rate of 3.3%. Other studies reported recurrence rates of up to 5% which are comparable to our study.

Ertan et al reported on 100 consecutive cases and observed shorter hospital stay, earlier healing, shorter time of work, lower ratios of complications, lower pain perception and improved general health, are the main advantages of modified Limberg's flap in pilonidal surgery[16]. All together these parameters add to patients comfort and satisfaction after surgical treatment. Another study done by Akca et al showed that morbidity developed in 24 patients treated by after Limberg's flap procedure 3 patients had morbidities (infection 2 and flap edema 1)[17].

Katsoulis et al performed a study with Limberg's flap procedure and they found wound complication rate was 16%, while in 2002, study conducted in 102 cases by Urhan et al showed that three patients developed seroma (2.9%), two patients (1.96%) had wound dehiscence, and one patient had purulent discharge from the wound[7,12]. Mentes and their colleagues analyzed using 353 patients Limberg flap procedure for pilonidal sinus disease which revealed no wound dehiscence and flap necrosis in any patient while 3.2% patients had recurrences at the end of the follow up period[18].. Eryilmaz et al performed a study in 2003 in which they observed wound complications and recurrence in 6% and 3%, respectively[19]. Milito and his colleagues conducted a study on two hundred sixteen patients with excision and rhomboid flap transposition from 1986 to 2004 for pilonidal sinus which showed flap necrosis in 5 patients (2.3%), post operative infection in 2 patients (0.9%), 4 patients (1.8%) had a seroma, and recurrences occurred in 5 patients (7.4%)[20]. In 2006, Lodhi et al in their study use of Limberg flap in the treatment Pilonidal sinus; on thirty patients found out wound complications in 3(10%) patients and no recurrence was noted[21]. In this series there was only one recurrent sinus in modified Limberg's group, which represents an overall recurrence rate of 3.3% during the study period.

Misiakos et al noted hospital stay of 1 to 2 days for Limberg's flap; in Jaschke et al studied the mean hospital stay was 7.9 days, where as Milito et al concluded hospital stay of 3.1±0.30 days. In our study mean hospital stay was 1.6days which is shorter than other studies.

CONCLUSION

Although this study had a small number of patients and short follow up period, it can be concluded that for primary sacroccocygeal pilonidal sinus disease Rhomboid excision with Limberg transposition flap is an effective treatment in terms of its low complication rate, a short hospital stay, the short time to return to normal activity, low recurrence rate, patient comfort and good long-term results. This procedure has good postoperative results and is a comfortable surgical method for the patient.

REFERENCES

1. Shah A WA, Malik A. Recurrence rates in pilonidal sinus surgery comparison of two techniques (Karydakis versus conventional open excision). Pak Journal Medical and Health Sci. 2009;3:41-8.
2. Rafi Y BT, Rehman HA, Rafiq K, Chaudhary AM. Pilonidal disease: a conservative approach to the problem. Ann of KEMU. 2001;7:83-4.
3. Cubukcu A, Gonullu NN, Paksoy M, Alponat A, Kuru M, Ozbay O. The role of obesity on the recurrence of pilonidal sinus disease in patients, who were treated by excision and Limberg flap transposition. International journal of colorectal disease. 2000;15(3):173-5. Epub 2000/08/23.
4. Chaudhary ZA AM, Rafi Y, Syed AS, Chaudhary AM. Primary closure after pilonidal sinus excision. Ann KEMU. 1997;2:9-10.
5. Adanali G, Senen D, Tuncel A, Ibrahimoglu D, Erdogan B. Squamous cell carcinoma developing in a pilonidal sinus. Plastic and reconstructive surgery. 2002;110(5):1367-8. Epub 2002/10/03.
6. Mohamed HA KI, Adly S. Comparison between three therapeutic modalities for non-complicated pilonidal sinus disease. The surgeon : journal of the Royal Colleges of Surgeons of Edinburgh and Ireland. 2005;3(2):73-7.
7. Urhan MK, Kucukel F, Topgul K, Ozer I, Sari S. Rhomboid excision and Limberg flap for managing pilonidal sinus: results of 102 cases. Diseases of the colon and rectum. 2002;45(5):656-9. Epub 2002/05/11.
8. Sondenaa K, Nesvik I, Andersen E, Natas O, Soreide JA. Bacteriology and complications of chronic pilonidal sinus treated with excision and primary suture. International journal of colorectal disease. 1995;10(3):161-6. Epub 1995/01/01.
9. Chintapatla S, Safarani N, Kumar S, Haboubi N. Sacrococcygeal pilonidal sinus: historical review, pathological insight and surgical options. Techniques in coloproctology. 2003;7(1):3-8. Epub 2003/05/17.
10. Lober CW, Mendelsohn HE, Fenske NA. Rhomboid transposition flaps. Aesthetic plastic surgery. 1985;9(2):121-4. Epub 1985/01/01.
11. Golladay ES WC. Pediatric pilonidal disease: a method of management. Southern medical journal. 1990;83(8):922-4.
12. Katsoulis IE, Hibberts F, Carapeti EA. Outcome of treatment of primary and recurrent pilonidal sinuses with the Limberg flap. The surgeon : journal of the Royal Colleges of Surgeons of Edinburgh and Ireland. 2006;4(1):7-10, 62. Epub 2006/02/08.
13. Memon F BNPS. Pilonidal excision, primary closure with wound drainage. PJS. 2005;10:18-20.
14. Seleem MI A-HA. Management of pilonidal sinus using fibrin glue: a new concept and preliminary experience. Colorectal disease : the official journal of the Association of Coloproctology of Great Britain and Ireland. 2005;7(4):317-22.
15. Bukhari AJ BA, Khan AZ, Abid KJ. Treatment of pilonidal sinus. Comparison of primary closure Karydakis technique wide local excision. Annals KEMU. 2003;9:74-6.
16. Ertan T, Koc M, Gocmen E, Aslar AK, Keskek M, Kilic M. Does technique alter quality of life after pilonidal sinus surgery? American journal of surgery. 2005;190(3):388-92. Epub 2005/08/18.
17. 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. The British journal of surgery. 2005;92(9):1081-4. Epub 2005/08/04.
18. Mentes O, Bagci M, Bilgin T, Ozgul O, Ozdemir M. Limberg flap procedure for pilonidal sinus disease: results of 353 patients. Langenbeck's archives of surgery / Deutsche Gesellschaft fur Chirurgie. 2008;393(2):185-9. Epub 2007/09/28.
19. 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. Epub 2003/11/26.
20. Milito G GM, Gallinela MM, Crocoli A, Spyrou M, Farinon AM. Modified Limberg's transposition flap for pilonidal sinus. Long term follow up of 216 cases. Annali italiani di chirurgia. 2007;78:227-31.
21. Lodhi FB IS, Shafiq M, Hussain R. . Pilonidal sinus; use of Limberg flap in the treatment. Professional Med J. 2006;29:469-71.