



Rhomboid Excision and Limberg Flap for Pilonidal Sinus Disease: A Clinical Study

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ABSTRACT

Introduction: Pilonidal sinus is an acquired disease of young adults especially males in the age group of 15 to 40 years. The multiplicity of treatments available for this condition (surgical /non surgical) are testimony to the lack of satisfaction found with each.

Objectives: To study the advantages of rhomboid excision and Limberg flap in pilonidal sinus disease

Material and Methods: It was the prospective study of 25 patients who were diagnosed to have pilonidal sinus (primary or recurrent). All the patients included in the study underwent rhomboid excision and Limberg flap by the same team. The post operative course of each patient was studied. Immediate complications of the procedure like wound infection, seroma, post operative pain and hospitalization time were recorded. Patients were followed up to 6 months for recurrence.

Result: Males were predominantly affected and female to male ratio 1:7. Mean age of the patient were 32.4 yrs. Most of the patients involved in work pertaining to prolonged sitting. Out of 25 patients, 4 patient developed wound infection. Flap tip necrosis was observed in one patient and prolonged drainage was present in 3 patients (average 18 days). We encounter one recurrence in 6th month follow up.

Conclusion: Primary and recurrent pilonidal sinus is very effectively managed by this procedure with minimum complications and very low recurrence rate.

Keywords: Pilonidal sinus, Rhomboid excision, Limberg flap, wound infection.

Introduction

The pilonidal sinus probably was first described by Mayo in year 1833 and first reported by Anderson in 1847¹. Warren in the year 1854 reported a case of an abscess containing hair in the natal cleft. Hodges in 1880 was the first to use the term "pilonidal" from Latin "pilus" It was common among jeep drivers in the Second World

War that it became known as "Jeep bottom. The estimated incidence was 26 per 100 000 people affecting men twice as often as women². The incidence rate of pilonidal disease is approximately 0.7%^{4,5,6}. The multiplicity of treatment modalities available for this condition are testimony to the lack of satisfaction found with each. The disease as such is not life threatening,

majority of people affected by pilonidal sinus disease are in the 15 to 30 year age group and a considerable amount of time may be lost from school or employment as a result of the disease or its treatment. There has been a debate regarding the best treatment for pilonidal diseases for many years. An ideal operation should be simple, should not need prolonged hospital stay, should have low recurrence rate, and should be associated with minimal pain, wound care and decrease the patient's time off-work³. In 1946, Limberg first described a technique for closing a 60° rhombus-shaped defect with a transposition flap. It meets the entire requirement for being the ideal procedure for sacrococcygeal pilonidal sinus if performed according to appropriate surgical principles. Literature study showed that this flap reconstruction is easy, safe and superior with low risk of complication and recurrence^{11,12,13}.

Hence, this study was performed in our setup to evaluate the usefulness of Limberg flap procedure in sacrococcygeal pilonidal sinus, patient compliance, complications, and long-term recurrence rates following the procedure.

Materials and Methods

This was a prospective study conducted in a surgical unit of a tertiary teaching hospital after getting approval from the institutional ethical committee. Duration of study was from august 2014 to July 2016 and it consisted of 25 patients of either gender between the age group of 20 to 50 years who gave consent were included. Demographic profile and detailed history of all the patients with clinical examinations and investigation were noted. All the patients were operated for pilonidal sinus disease by rhomboid excision and limberg flap. The postoperative course and complication was noted and treated accordingly for pain, flap edema, flap tip necrosis, seroma formation and prolonged drainage. Follow up of the patients were done for six month for recurrence. All the clinical data of each patient was recorded in the pre-coded clinical Performa.

The result of the study was statistically analyzed in the EPI info software.

Surgical details

Limberg rhomboid flap^{7,8,9,10}

Anaesthesia: regional / general anaesthesia

Position of patient: prone position with buttocks apart

Procedure detail: The rhomboid flap starts by excising all existing sinuses down to the presacral fascia using a rhombic incision. Rhombic area of skin and subcutaneous fat excised which includes both midline clefts and any lateral sinus extensions. Long axis of the rhomboid is in the midline. Linear measurements are useful.

Rhomboid

Line A-C drawn.

Point C adjacent to the perineal skin.

Point A placed so that all diseased tissue can be included in the excision.

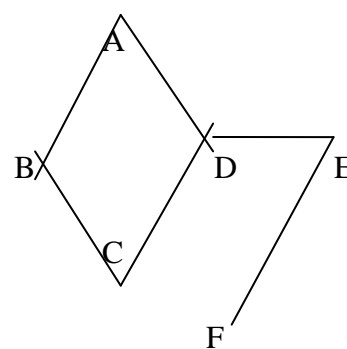
Line B-D transects the mid-point of A-C at right angles and was 60% of its length.

Flap:- D-E was a direct continuation of line B-D and was of equal length to the incision

B-A, to which it was be sutured after rotation.

E-F was parallel to D-C and of equal length.

After rotation it was sutured to A-D.



The flap consisted of skin and fat and was constructed by extending the incision to the gluteal muscle fascia. The skin was approximated after insertion of a vacuum drain.

Results

Distribution of gender in pilonidal sinus

Predominant population was male with sex ratio of female to male was 1:7

Table 1

Gender	Number of patients (N)	Percentage (%)
Male	22	88%
Female	3	12%
Total	25	100%

Age group wise distribution of patients in pilonidal sinus

Patients between the age group 2nd to 4th decade were most commonly affected.

Mean age of patients were 32.4yr with range 20-45

Table 2

Age group in years	No. of patients (N)	Percentage (%)
20-30 years	11	44%
31-40 years	12	48%
41-50years	2	8%
Total	25	100%

Occupation

It was seen in people who have a work pertaining to prolonged duration of sitting

Table 3

Occupation	No. of patients (N)	Percentage (%)
Student	4	16%
Shop keeper	9	36%
Field worker with bike	3	12%
Factory worker	3	12%
Clark	6	24%
Total	25	100%

Clinical features

The most common symptom was discharge

Table 4

Symptoms	No. of patients (N)	Percentage (%)
Discharge	25	100%
Pain or discomfort	15	60%
Swelling	7	28%
Past intervention	3	12%

Examination Finding

All patients presented had sinus and discharge on and off

Table 5

	No. of patients (N)	Percentage (%)
Discharge	25	100%
Tenderness	10	40%
Induration	7	28%
Past intervention	3	12%
Sinus	25	100%

Complications

Commonest complication observed was seroma formation

Table 6

Complication	No. of patients (N)	Percentage (%)
Seroma formation	3	27.28%
Flap edema	4	36.36%
Flap tip necrosis	1	9.09%
Wound dehiscence	1	9.09%
Prolonged drainage	2	18.18%
Total	11	100%

Discussion

Pilonidal sinus is a common disorder of the sacrococcygeal region. In India, the prevalence is 0.26%^{14,15}. It affects mostly young populations and leads to interference in education and absentees in working place for prolonged time period. The etio-pathogenesis of pilonidal sinus disease is controversial varying from congenital to more accepted hormonal and acquired theory. Occurrence of the disease is mostly depends on the ‘invader’ consisting of loose hair, ‘a force’ that causes hair insertion and ‘vulnerability’ of the skin to hair insertion in natal cleft^{16,17,18,19}. Diagnosis is mostly clinical. There is no effective single most procedure available which will be free of complication and recurrence^{20,21}. The procedure, rhomboid excision and Limberg flap have less incidence of recurrence, less morbidity, less duration of hospital stay and good patient compatibility made the procedures popular and acceptable with minimal cosmetic disfigurement²². Definitive treatment is best provided when the patient initially presents to the surgeon

to prevent loss of time from work and distress to the patient.

Recurrence was the main problem associated with all surgeries described which ranged from 21.4% to 100% for incision and drainage, 5.5%–33% for excision and open packing, 8% for marsupialisation, 3.3%–11% for Z plasty²⁴. Limberg flap procedure flattened the internal cleft and tissue can be approximated without tension thus avoiding the scar in the midline^{22, 23}.

Present study consisted of 25 patients with sacrococcygeal pilonidal sinus. Three patients were previously treated by surgery. Two underwent excision and primary suturing and one with marsupialization. All these patients, primary and recurrent underwent Rhomboid excision and Limberg flap reconstruction under spinal anesthesia. Negative suction drain was kept in all the patients. In our study, males were most commonly affected than female with male to female ratio 7:1. The other studies also confirm that the disease is predominant in males^{9, 25}. Mean age of the patient was 32.4 years. Two patients in our study were above the age of 40 years but the disease was appeared in thirty. The other studies also coincide with the same findings¹¹. Considering the etiology of the disease, our patient also subjected to sit for prolonged period of time. Most predominant symptoms were discharge. The complications that were noted were seroma formation, wound infection, flap tip necrosis, wound dehiscence. Wound dehiscence was allowed to granulate and then sutured secondarily. Our two patients had prolonged drainage of drain for three weeks which reduced gradually.

The incidence of complications in the western literature for Limberg flap is 8.33%²⁶ The complication rate in present study was 25.64% which is significantly higher but except wound dehiscence in 1 and prolonged drainage in 2 patients all other complications healed in due course of time. Average hospital stay was 2 week as most of the patients were discharged after suture removal on 10th or 12th day. Follow up

was done for 6 months on monthly basis and we encounter one recurrence in fourth month

Conclusion

Rhomboid excision and limberg flap is simple, safe and effective procedure for treatment of pilonidal sinus. The learning curve is short and the procedure can be easily mastered. The procedure avoid scar in midline and thus it helps in maintaining good hygiene, reduces friction, prevents maceration, flattens the natal cleft without cosmetic disfigurement and low complications as well as recurrence rate.

References

1. Anderson AW. Hair extracted from an ulcer; Boston Medical and Surgical Journal 1847; 36:74.
2. Sondena K, Andersen E, Nesvik I, Soreide JA. Patient characteristics and symptoms in chronic pilonidal sinus disease. Int J Colorectal Dis 1995 Feb;10(1):39-42.
3. Solla JA, Rothenberger DA. Chronic pilonidal disease. An assessment of 150 cases. Dis Colon Rectum 1990 Sep;33 (9):758-61.
4. W. H. Palmer "Pilonidal disease A new concept of pathogenesis" Diseases of the Colon and Rectum. 1959; Vol.-2; No.-3: Pg. 303-307.
5. Davage "The origin of sacrococcygeal pilonidal sinuses:based on an analysis of four hundred sixty–three cases" American Journal of Pathology. 1954; Vol.-30:Pg.1191–1205.
6. Brearly. R. "Pilonidal sinus:a new theory of origin." British Journal of Surgery. 1955; Vol.-43:Pg.62–68.
7. Hull T.L. et al."Pilonidal disease." Surgery Clinics of North America. 2002; Vol.82: Pg.1169-85.
8. Koray Topgül, et al. "Long-term results of limberg flap procedure for treatment of pilonidal sinus: a report of 200 cases."

- Diseases of the Colon and Rectum. November 2003; Vol.-46 (11): Pg.1545-1548. May 2004; Vol.34; No.5: Pg.419-423.
9. Omer Menten, et al. "Limberg Flap Procedure for Pilonidal Sinus Disease-Results of 353 Patients" *Langenbecks Archives of Surgery*. March 2008; Vol.-393; No.2.: Pg. 185-189.
 10. Murat Akin, et al. "Rhomboid Excision and Limberg Flap in the Management of Pilonidal Sinus-Long Term Results of 411 cases" *Colorectal Disease* Vol.9999 Issue 999A May 2008.
 11. Srikanth K. Aithal C. S. Rajan, and Narender Reddy Limberg Flap for Sacrococcygeal Pilonidal Sinus a Safe and Sound Procedure *Indian J Surg*. 2013 Aug; 75(4): 298– 301.
 12. Akca T, Colak T. Primary closure with Limberg flap in treatment of pilonidal sinus-randomized clinical trial. *BJS*. 2005;5074:1081–1084. doi: 10.1002/bjs.5074
 13. Azab AS, Kamal MS, Saad RA, About AL, Atta KA, Ali NA. Radical cure of pilonidal sinus by a transposition rhomboid flap. *BJS*. 1984;71(2):154–155. doi: 10.1002/bjs.1800710227
 14. Chiedozi L C, Al-rayyes F A, Saleem M Mand Al-Hadi F H (2002), "Management of Pilonidal sinus", *Saudi Med J*, Vol. 23, pp. 786-788.
 15. Armstrong J H and Barcia P J (1994), "Pilonidal Sinus Disease (The conservative approach)", *Arch Surg*, Vol. 129, pp. 914-917.
 16. Surrell J A (1994), "Pilonidal Disease", *SurgClin North Am*, Vol. 74, pp. 1309-1315.
 17. da Silva J H (2000), "Pilonidal Cyst: Cause and Treatment", *Dis Colon Rectum.*, Vol. 43, pp. 1146-1156.
 18. Allen-Mersh T G (1990), "Pilonidal Sinus: Finding the Right Track for Treatment", *Br JSurg*, Vol 77, pp 123-132.
 19. Karydakos G E (1992), "Easy and Successful Treatment of Pilonidal Sinus After Explanation of Its Causative Process", *Aust N Z J Surg* , Vol. 62, pp. 385-389.
 20. Petersen S, Koch R, Stelzner S *et al.* (2002), "Primary Closure Techniques in Chronic Pilonidal Sinus: A Survey of the Result of Different Surgical Approaches", *Dis Colon Rectum*, Vol. 45, pp. 1458-1462.
 21. Al-Khamis A, McCallum I, King PM, *et al.* (2010), "Healing by Primary Versus Secondary Intention After Surgical Treatment For Pilonidal Sinus", *Cochrane Database Syst Rev*, Vol. 20, p. 1.
 22. Walid G E and Kaled S (2012), "Clinical Trial Comparing Open Excision and Primary Closure With Modified Limberg Flap in Treatment of Uncomplicated SPD", *AJM* , Vol. 48, pp. 13-18.
 23. Can M F, Sevinc M M, Hancerliogullari O, *etal.* (2013), "Multicenter Prospective Randomized Trial Comparing Modified Limberg Flap Transposition and Karydakos Flap Reconstruction In Patients With Sacrococcygeal Pilonidal Disease", *Am J Surg* , Vol. 200, pp. 318-327.
 24. Jethwani U, Singh G, Mohil RS, Kandwal V, Chouhan J, Saroha R, et al. Limberg flap for pilonidal sinus disease: our experience. *OA Case Reports* 2013 Aug 08;2(7):69.
 25. Shreeraz Shakoore et al. "Pilonidal sinus: Flooding the Aristotelian middle" *Pakistan Journal Of Medical Sciences* October – December 2008. Part II. Vol.-24: No.-6; Pg.845-846.
 26. Akmal Jamal et al. "Open excision with secondary healing versus rhomboid excision with Limberg transposition flap in the management of sacro coccygeal pilonidal disease" *Journal of Pakistan Medical Association*. March 2009. Vol.-59 (3); Pg.- 157-160.