IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 5 Ser. 3 (May. 2019), PP 64-70
www.iosrjournals.org

Limberg Flap Reconstruction for Pilonidal Sinus

[1.]Dr.P.Saravanakumar , [2.]Dr.V.Jayaprakash
[1]*MS-Assistant Professor, Department of General surgery-Govt. Mohan Kumaramangalam Medical college and Hospital –Salem-Tamilnadu –India.*
[2]*MS-Assistant Professor, Department of General surgery-Govt. Mohan Kumaramangalam Medical college and Hospital –Salem-Tamilnadu –India.*
Corresponding Author: Dr.P.Saravanakumar

Abstract: *Pilonidal sinus is a relatively common condition affecting men twice as often as women. The estimated incidence is 26 per 100,000 people. The management of pilonidal sinus disease remains controversial, and gold standard treatment modality has yet to be established. Limberg Flap Reconstruction is a safe and reliable technique in the treatment of sacrococcygeal pilonidal sinus disease, with low complication and recurrence rates if performed according to appropriate surgical principles.*
Methods: *This is a Prospective study on 52 patients between April 2016 to April 2019 at Department of General surgery-Govt Mohan Kumaramangalam Medical college and Hospital -Salem. Patients having primary or recurrent pilonidal sinus disease underwent this operation.*
Results: *Fifty-Two patients had this surgery. Among them, 38 (73%) were males and 14 (27%) were female. The mean age was 31, (Range: 17–45 years). 14 (26.9%) presented with recurrent sinus and 5 of them had previous surgery on more than one occasions. Fifty patients (96%) had full primary healing without any complication. Two (4%) patient had minimal epidermolysis of flap corners. One (1.92%) had slight gaping of wound edges. However, all three healed completely with conservative treatment. The mean length of hospital stay was 2.45 (Range: 1–5days) and most patients returned to work within 3 weeks.*
Conclusion: *Limberg flap is very effective for pilonidal disease with low complication rates, short hospitalisation, low recurrence rates, earlier healing and shorter time off-work. The surgery can be easily mastered. We recommend Limberg flap as preferred surgery for cases of Pilonidal sinus.*
Keywords*: Pilonidal sinus, Rhomboid flap, Limberg's Flap.*

Date of Submission: 26-04-2019 Date of acceptance: 11-05-2019

I. Introduction

Pilonidal sinus is a relatively common condition affecting men twice as often as women. The estimated incidence is 26 per 100,000 people. It is most frequently seen in the sacrococcygeal region. However, it has also been described in the axilla, suprapubic area, periumbilical zone and between the fingers of the hand in the barbers. [1-2] It usually presents as a cyst, abscess, or one or more sinus tracts with or without discharge in the upper part of the natal cleft. Hair tufts within the sinus, seen in about 60% of the cases, are now considered important secondary outcome in the evolution of the sinus. The most important predisposing factors for the development of pilonidal sinus are the existence of a deep natal cleft and the presence of hair within the cleft. A deep natal cleft is a favourable environment for sweating, maceration, bacterial contamination, and penetration of hairs. [3] Thus, for treatment and prevention, these causative factors must be eliminated. Male gender, obesity, smoking, family tendency, poor body hygiene, sinus size, and the surgical procedures performed have been sustained in a number of studies as primary riskfactors for postoperative complications and recurrence. [4] The management of pilonidal sinus disease remains controversial, and gold standard treatment modality has yet to be established. The simplest is incision and drainage, laying open, open excision, excision and primary closure. The more complex ones include Bascom's, Kardaykis and a rhomboid excision with Limberg flap. Limberg procedure is a safe and reliable technique in the treatment of sacrococcygeal pilonidal sinus disease, with low complication and recurrence rates if performed according to appropriate surgical principles. In this prospective study, the experience with Limberg Flap technique in treatment of pilonidal sinus disease is presented

II. Material And Methods

This is a Prospective study on 52 patients between April 2016 to April 2019 at Department of General surgery-Govt Mohan Kumaramangalam Medical college and Hospital -Salem. Patients having primary or

recurrent pilonidal sinus disease underwent this operation. Patients who had pilonidal abscess had incision and drainage first with before the definite treatment.

These patients were advised to return to normal activities after removal of stitches, after about 10 days, but to avoid excessive physical strain and strenuous sports for following 3 to 4 weeks. Follow up of all patients was performed on outpatient basis, every month for first six months and then six monthly for a period of twelve months.

Surgery is performed either in general or spinal anaesthesia. Patient is placed in jack-knife position with buttocks strapped for wide exposure. After adequate shaving and skin preparation, area to be excised is carefully marked and flap lines are mapped on the skin (Figure-1).

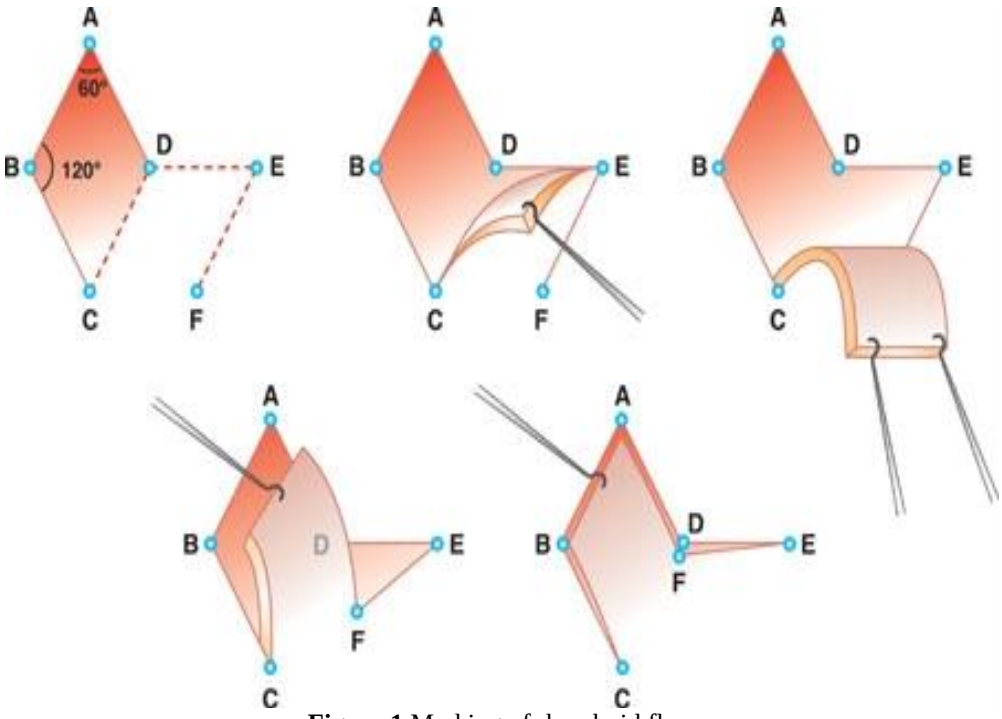

Figure 1 Marking of rhomboid flap.

The long axis of the rhomboid was in the midline and its shape determined by angles of 60 degrees at A and C and 120 degrees at B and D. Accuracy is essential for success, and the rhomboid of tissue to be excised and the flap was measured and marked with indelible pen at the start of surgery. First, the line A–C was drawn and its length measured. C should be adjacent to the perianal skin, and A was placed so that all diseased tissue included in the excision. The line B–D transected the midpoint of A–C at right-angles and was 60 per cent of its length. It was this ratio of lengths which determined the correct shape to the rhomboid. The flap was planned so that D–E was a direct continuation of the line B–D and of equal length to the incision B–A to which it was sutured after rotation. E–F was parallel to D–C, and of equal length. After rotation, it was sutured to A–D.

Operative steps:

1. Surgery was performed under general anaesthesia or regional anaesthesia.
2. After adequate skin preparation, Patients were placed in prone jack-knife position with buttocks strapped with adhesive tapes for wide exposure.
3. The extent of the sinus was assessed by injecting methylene blue into all sinuses to outline its cavity.
4. The rhomboid area to be excised was marked and flap lines were mapped on the skin (Fig. 2).

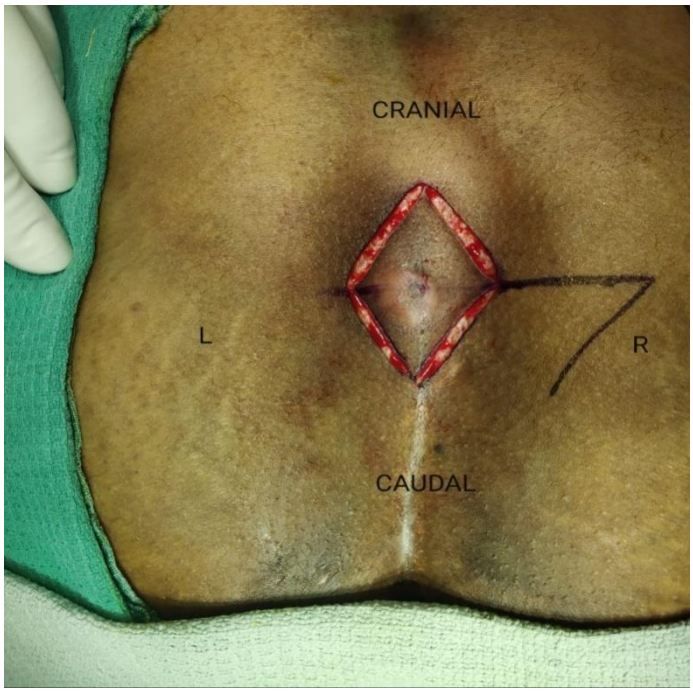

Figure 2: Marking of skin for excision and limberg flap.

5. The rhomboid skin incision (with each side equal in length) was deepened to the pre-sacral fascia centrally and to the gluteal fascia laterally (Fig. 3).

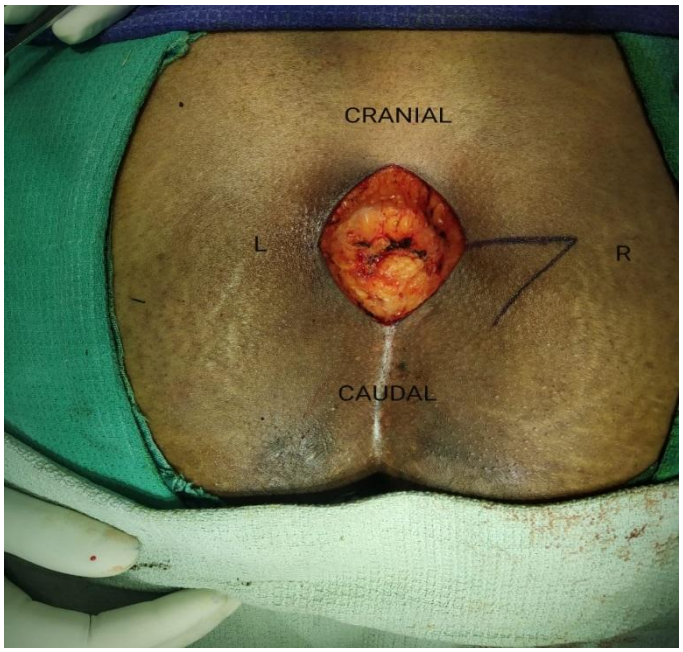

Figure 3: Flap with sinus excised.

6. Under the guidance of methylene blue, all sinuses were excised enbloc without incising outpocketings of the sinus cavity
7. After excision, the Limbergfasciocutaneous flap was prepared by extending the incision laterally down to the fascia of the gluteus Maximus muscle (Fig. 4,5).

Figure 4: Fasciocutaneous flap raised.

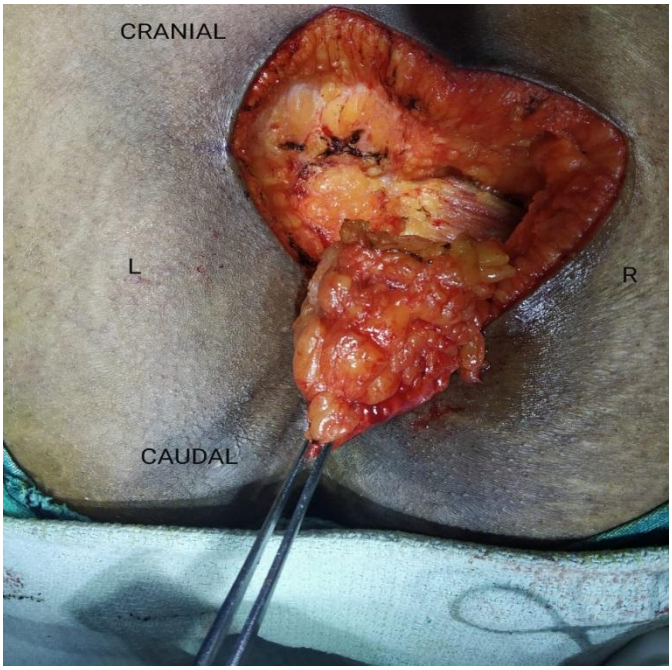

Figure 5: Fasciocutaneous flap raised with Gluteus Maximus muscle exposed

8. The size of the prepared flap was equal to that of the rhomboid area. Thefasciocutaneous flap was transposed medially to cover the rhomboid defect created by excision of the sinus without any tension.
9. Haemostasis was achieved by the use of electrocautery
10. A single multiple-hole, closed suction drain was inserted underneath the flap.
11. Subcutaneous tissue was approximated with interrupted vicryl 2-0 suture. The skin was closed with interrupted prolene 3-0 suture (Fig. 6).

Figure 6 : Flap stitched.

12. Antibiotics are given for 5 days initially intravenous subsequently oral.
13. Drain was removed after 48–72 hours.
14. Alternate sutures were removed on 10th postoperative day (POD). Rest of the sutures were removed on the 12th POD.
15. Postoperatively patients were advised, to avoid prolonged sitting or exercise for two weeks. Hair removal either by shaving or by hair removal cream was advised for at least 1 month.
16. Patients were followed up in OPD monthly for 6 month

Important points for successful flap

- ❖ To prevent wound infection gauzes placed on the sinus openings are not used elsewhere
- ❖ Cautery is used in cutting mode in the superficial area then used in coagulation mode in deep area (skin perfusion)
- ❖ Excessive hemostasis, especially on the flap, impairs wound healing
- ❖ To avoid contamination diseased tissue is held by folding the edges inward
- ❖ Pressacral fascia should left in place
- ❖ Flap stabilization stiches are passes through thepresacral fascia
- ❖ Following excision, the gap filled with sterile gauze
- ❖ Limberg flap-the incision down to the gluteus Maximusmuscle. fascial tissue on thismuscle is included in flap
- ❖ Flap manipulation must be atraumatic, as much as possible.
- ❖ The prepared skin flap base is fixed to the presacral fascia
- ❖ Vacuum drain is placed between the presacral fascia and flap
- ❖ Deep subcutaneous tissue is secured with 2-0 vicryl,superficial subcutaneous tissue secured with 3-0 vicryl
- ❖ Skin closed with 3-0 prolene: not over–tighten, not tying knots on the flap
- ❖ Intergluteal sulcus sutures should be placed lastly to additional prevention for the contamination.

III. Results

Fifty-Two patients had this surgery. Among them, 38 (73%) were males and 14 (27%) were female. The mean age was 31, (Range: 17–45 years). 7 (26.9%) presented with recurrent sinus and 3 of them had previous surgery on more than one occasions. Fifty patients (96%) had full primary healing without any complication. Two (4%) patient had minimal epidermolysis of flap corners. One (1.92%) had slight gaping of wound edges. However, all three healed completely with conservative treatment. The mean length of hospital stay was 2.45 (Range: 1–5days) and most patients returned to work within 3 weeks.

Table 1: Demographics of patients

Demographic characteristics	Characteristics
Age (years	31 (17–46)
Gender Male Female	 38(73%) 1(27%)
Duration of symptoms (months)	4.8 (1–8
Operative time (minutes)	38 (24-58min)
Pain score (VAS)	3.25 (3-5)
Postoperative hospital stay (days)	2.45 (1-5)

Table 2: Complications

S. No	Complication	Number (%)
1	Seroma	2(3.8)
2	Infection	1(1.92)
3	Necrosis at tip of the flap/Epidermolysis	2(3.8)
4	Gaping	1(1.92)
5	Recurrence	-

IV. Discussion

Sacrococcygeal pilonidal disease occurs in the midline. Increased depth of the intergluteal sulcus leads to an anaerobic media and increased anaerobic bacterial content. [5-6]

Also, the vacuum effect created between heavy buttocks is thought to play an additional role in pilonidal disease development. The vacuum effect sucks the anaerobic bacteria, hair, and debris into the subcutaneous fat tissue. If these factors responsible for the development of the disease are not eliminated, they will play a major role in the development of disease recurrence as well. [7-8]

Although many surgical and nonsurgical treatment methods have been described, the ideal treatment method has not yet been established for pilonidal disease. Complete excision of the sinus is widely practiced, but controversy remains about what to do with the wound after excision. [9]

Excision and packing, excision and primary closure, marsupialization, and flap techniques are surgical procedures that have been developed for treatment of pilonidal sinus.

The problems related to a continuing natal cleft after pilonidal sinus surgery has prompted surgeons to discover techniques to eliminate the gluteal furrow. Bascom hypothesized that infection starts in the hair follicles, which have open orifices that initiate the development of infection and sinus. He recommended excision of the midline pits with lateral open drainage of any associated abscess [3]. Karydakis used an asymmetric excision and primary closure to prevent hair penetration into the natal cleft. [10-11]

With this technique, the natal cleft is flattened, and the incisional line and scar are transferred laterally from the midline. To eliminate natal cleft and wound tension, various plastic reconstructive techniques such as Z-plasty, W-plasty, V-Y plasty and various flap techniques have been used. [12]

However, adipo-fasciocutaneous flap, classic Limberg flap, and modified Limberg flap techniques are the most recently favouredtechniques. Compared with open packing and marsupialization, excision and primary closure is known to provide quicker healing and quicker return to work. Most patients return to work in 3 to 4 weeks. [13] However, a high complication rate has been reported because of tissue tension, although some surgeons have reported good results after primary closure. [14-15]

Flap techniques have been associated with lower infection and recurrence rates, shorter hospital stay, and better aesthetic results. With this technique, the internal cleft can be flattened, and tissue can be approximated without tension.

The importance of the post-operative wound care should also be stressed. Exercise or sitting down on the wound should be avoided for two weeks and the patient has to return slowly to normal activities. Hair removal either by shaving the edges of the wound is mandatory. This has to be continued at least until complete healing of the wound, but preferably on a long-term basis. [16]

The advantages of Limberg flap reconstruction:

Flattens the natal cleft with a large well-vascularised pedicle that can be sutured without tension.
Midline dead space and scar is avoided.
Useful in complex sinuses with multiple pits where radical excision leaves large defect.
Easy to perform, learn and design.
Useful in recurrent pilonidal disease.
Reduces hospital stay and time to resume normal activities.

V. Conclusion

Limberg flap is very effective for pilonidal disease with low complicaion rates, short hospitalisation, low recurrence rates, earlier healing and shorter time off-work. The surgery can be easily mastered. We recommend Limberg flap as preferred surgery for cases of Pilionidal sinus.

References

[1]. McCallum I, King PM, Bruce J. Healing by primary versus secondary intention after surgical treatment for pilonidal sinus. Cochrane Database Syst Rev 2007(4): CD006213.
[2]. Sondenaa K, Andersen E, Nesvik I, Soreide JA. Patient characteristics and symptoms in chronic pilonidal sinus disease. Int J Colorectal Dis 1995; 10(1):39–42.
[3]. Bascom J. Pilonidal disease: origin from follicles of hairs and results of follicle removal as treatment. Surgery 1980; 87:567–72.

[4]. Onder A, Girgin S, Kapan M, Toker M, Arikanoglu Z, Palanci Y et al. Pilonidal sinus disease: risk factors for postoperative complications and recurrence. Int Surg. 2012 Jul-Sep; 97(3): 224-9.
[5]. Marks J, Harding KG, Hughes LE, et al. Pilonidal sinus excision – healing by open granulation. Br J Surg 1985; 72:637–40.
[6]. Miocinovic M, Horzic M, Bunoza D. The prevalence of anaerobic infection in pilonidal sinus of the sacrococcygeal region and its effect on the complications. Acta Med 2001; 55:87–90.
[7]. Akinci OF, Bozer M, Uzunkoy A, et al. Incidence and etiological factors in pilonidal sinus among Turkish soldiers. Eur J Surg 1999; 165:339–42.
[8]. Karydakis GE. The etiology of pilonidal sinus. Hellenic Armed Forces Med Rev 1975; 7:411–6.
[9]. Corman ML. Colon and rectal surgery. 2nd ed. Philadelphia: Lippincott, 1989:297–304.
[10]. Karydakis GE. Easy and successful treatment of pilonidal sinus after explanation of its causative process. ANZ J Surg 1992; 62:385–9.
[11]. Kitchen PR. Pilonidal sinus: experience with the Karydakis flap. Br J Surg 1996; 83:1452–5.
[12]. Nessar G, Kayaalp C, Seven C. Elliptical rotation flap for pilonidal sinus. Am J Surg 2004; 187:300–3.
[13]. Khaira HS, Brown JH. Excision and primary closure of pilonidal sinus. Ann R CollSurgEngl 1995; 77:242–4. [14]Morell V, Brian LC. Surgical treatment of pilonidal disease: comparison of three different methods in fiftynine cases. Mil Med 1991; 156:144–6.
[14]. Holm J, Hultén L. Simple primary closure for pilonidal sinus. ActaChirScand 1970; 136:537–40.
[15]. Hull TL, Wu J. Pilonidal disease. SurgClin North Am 2002; 82:1169–85.
[16]. Katsoulis IE, Hibberts F, Carapeti EA. Outcome of treatment of primary and recurrent pilonidal sinuses with the Limberg flap. Surgeon 2006; 4(1):7–10, 62.
[17]. Akin M, Gokbayir H, Kilic K, Topgul K, Ozdemir E, Ferahkose Z. Rhomboid excision and Limberg flap for managing pilonidal sinus: long-term results in 411 patients. Colorectal Dis 2008; 10:945–8.
[18]. 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; 45:656–9.
[19]. Mentes BB, Leventoglu S, Cihan A, Tatlicioglu E, Akin M, Oguz M. Modified Limberg transposition flap for sacrococcygeal pilonidal sinus. Surg Today 2004; 34:419–23.
[20]. Aslam MN, Shoaib S, Choudhry AM. Use of Limberg flap for pilonidal sinus - a viable option. J Ayub Med Coll Abbottabad. 2009; 21(4):31-3.
[21]. El-Khadrawy O, Hashish M, Ismail K, Shalaby H. Outcome of the rhomboid flap for recurrent pilonidal disease. World Journal of Surgery. 2009 May 1; 33(5):1064-8.

Dr.P.Saravanakumar. "Limberg Flap Reconstruction for Pilonidal Sinus." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 5, 2019, pp 64-70.