

Limberg Flap Reconstruction for Pilonidal Sinus

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Abstract

Background: 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 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.

Methods: This is a Prospective study on 52 patients between Jan 2012 to Dec 2015 at Plastic surgery Department at a tertiary care hospital. 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. One hundred and seven patients (97.27%) 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, Bascom procedure

1. 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 favorable 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 risk

factors 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

2. Material and methods

This is a Prospective study on 52 patients between Jan 2012 to Dec 2015 at Plastic surgery Department at a tertiary care hospital. 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 anesthesia. Patient is placed in jackknife 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).

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.

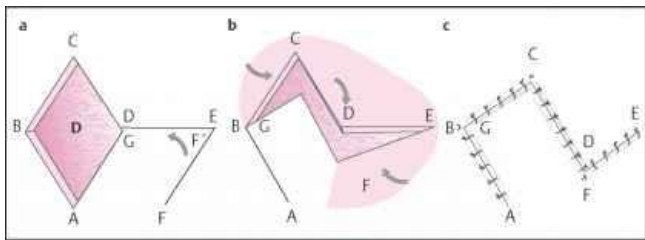


Figure 1 Marking of rhomboid flap.

The rhomboid incision including the sinus and its extensions is made down to the pre-sacral fascia. Flap is constructed by extending the incision laterally and down to the fascia of the gluteus maximus muscle. The diseased area is removed en bloc. Flap should be exactly of the same angles and length of the defect made by the excision. Thus a rhombic shaped fasciocutaneous flap is developed. The flap is transposed into the rhombic defect without tension. Suction drain is placed in the wound cavity, through a separate stab incision. Subcutaneous tissue is approximated with interrupted 2/0 vicryl. Skin is closed with mattress interrupted stitches with prolene 3/0. Antibiotics are given for five days, initial intravenous and then oral. The suction drain is removed on after 48 hrs. Sutures are removed on 10th post operative day.



Figure 2: Recurrent Pilonidal sinus



Figure 3: Perioperative After excision and flap marking



Figure 4: Flap elevation and inset.



Figure 5: Immediate Post op



Figure 6: Scar at end of 6months

3. 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.

Table 1: Demographics of patients

| Demographic characteristics | Characteristics |
|------------------------------------|-----------------|
| Age (years) | 31 (17–46) |
| Gender | |
| Male | 38(73%) |
| Female | 14(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 | Infecton | 1(1.92) |
| 3 | Necrosis at tip of the flap/Epidermolysis | 2(3.8) |
| 4 | Gaping | 1(1.92) |
| 5 | Recurrence | - |

4. 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]. Karydakakis 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 favored techniques. 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]

Table 3: Comparison with other studies

| Patents (no.) | Hospital stay (days) | Complication (%) | Recurrence (%) | Reference |
|---------------|----------------------|------------------|----------------|---------------|
| 25 | 4.0 | 16 | - | [17] |
| 411 | 3.2 | 15.75 | 2.91 | [18] |
| 102 | 3.7 | 7 | 4.9 | [19] |
| 238 | 2–3 | 2 | 1.26 | [20] |
| 110 | 3.0 | 5 | 1 | [21] |
| 40 | 5–11 | 40 | 10 | [22] |
| 52 | 2-3 | 11.4 | - | Current study |

The advantages of Limberg flap reconstruction are:

- 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.

5. 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.

Conflict of Interest:None to disclose

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