



Limberg Flap Procedure in Patients with Sacrococcygeal Pilonidal Sinus Disease - a single centre experience

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Abstract

Introduction:

Pilonidal disease is a very common anorectal problem that most often arises in the hair follicles of the natal cleft of the sacrococcygeal area. The management of pilonidal disease depends on its presentation and ranges from simple incision and drainage to a wide excision with extensive reconstructive procedures. The aim of the present study was to evaluate the results of patients retrospectively who were operated on with Limberg flap technique in Rajiv Gandhi government general hospital, Chennai.

Case Study:

Twenty patients with sacrococcygeal pilonidal sinus disease treated with the Limberg flap procedure between September 2017 and August 2019 at Rajiv Gandhi government general hospital were evaluated with respect to age, gender, preoperative symptoms, duration of preoperative symptoms, history of pilonidal sinus surgery, early postoperative complications, recurrence rates, and cosmetic satisfaction. During follow up period, the patients were called for follow up visit by telephone. Patient's data were evaluated from their hospital records.

Result: The patient population consisted of 18 males and 2 females. The most frequent symptom was seropurulent discharge. Post operative morbidity noted in 2 out of 20 patients. The mean length of hospital stay was 6 days. Recurrence of pilonidal sinus was noted in 1 out of 20 patients. The average period for return to work was 23 days.

Conclusion :

The Limberg flap procedure is a safe treatment alternative for the surgical treatment of sacrococcygeal pilonidal sinus disease owing to the associated low complication rate, short hospital length of stay, rapid healing, and a high patient satisfaction rate.

Keywords: Pilonidal sinus, Limberg flap, low complication rate, safe alternative.

Introduction

Pilonidal sinus disease (PSD) is a chronic inflammation and infection of the sacrococcygeal region. It often affects young adult males and produces clinic findings with abscess and discharge in sacrococcygeal region or painful sinus tract in the natal cleft. In the etio pathogenesis of pilonidal sinus

disease, it is commonly accepted that non-living hairs provoke a foreign body reaction subcutaneously, leading to abscess and sinus formation. Pilonidal sinus disease is common among young men and does not occur in childhood, which suggests an acquired etiology. Complete removal of the sinus or sinuses and proper reconstruction are required to achieve full

recovery and prevent recurrence. For this purpose, many surgical techniques and medical methods have been described. The aim of the present study was to evaluate the results of patients retrospectively who were operated on with Limberg flap technique in Rajiv Gandhi government general hospital, Chennai.

Methods:

Twenty patients with sacrococcygeal pilonidal sinus disease treated with the Limberg flap procedure between September 2017 and August 2019 at Rajiv Gandhi government general hospital were evaluated with respect to age, gender, pre operative symptoms, duration of symptoms, a history of pilonidal sinus surgery, recurrence rate and cosmetic satisfaction. During follow up period, the patients were called for follow up visit by telephone. Patient's data were evaluated from their hospital records.

Surgical Procedure:

All patients were taken into the operation under spinal anaesthesia in prone position. All of them were administered antibiotics prophylaxis with 1 g ceftriaxone through intravenous method on the operating table. The patients were placed in the jackknife position allowing better sight of the operation area, and both buttocks were retracted to the lateral using sticky tapes. The operating site was cleaned with 10% povidone-iodine solution.

Using a sterile skin-marking pen a rhomboid area of skin was marked over pilonidal sinus involving all midline pits and lateral extension if any. The flap design was mapped on the skin. The long axis of the rhomboid in midline was marked as A-C, C being adjacent to perianal skin, A placed so that all diseased tissues can be included in the excision. The line B-D transected the midpoint of A-C at right angles and is 60 % of its length. D-E was a direct continuation of the line B-D and was 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. A rhombic-shaped excision of the sinus-bearing skin and subcutaneous tissue up to the pre-sacral fascia was done by electrocautery. Then elevation of perforator-based Limberg flap (based on the superior gluteal and sacral perforators according to the study done by Koshima *et al* on a cadaver dissection) in the same manner and the level of dissection was pre muscular fascia, good haemostasis was achieved and the adhesive tapes which retracted the buttocks were released to allow suturing of the flap without tension. A right or left sided fasciocutaneous Limberg transposition flap, incorporating the gluteal fascia, was fully mobilized on its inferior edge and transposed medially to fulfil the Limberg defect. The defect thus created was closed in linear fashion. Interrupted Vicryl 2-0 sutures to include fascia and fat were placed over a vacuum drain, and then finally the skin was closed with 3-0 monofilament polyamide.

The operation produces a tension-free flap of unscarred skin in the midline. The patient was advised not to put pressure on the flap for 3 weeks. All the patients were evaluated for flap healing, seroma formation, oedema, flap necrosis, surgical site infection, pain and length of hospital stay. The objective grading of pain was done by visual analogue scale. The patients were followed at 3 and 6 months after surgery. When the drain amount fell below 30 mL/day for 3 days, it was removed. Antibiotics were continued until the end of the first postoperative week. Wound sutures were removed 10–12 days postoperatively. According to hospital records, the patients had been followed up weekly for the first 6 weeks, and then at 3- month and 6-month intervals after discharge.

Marking skin incision



Excision of pilonidal sinus tract



Raising inferior Limberg flap



Drain placement and skin suturing



A case of healthy wound



A case of flap necrosis



Results:

The patient population consisted of 18 males and 2 females. The male to female ratio was 9. Pilonidal sinus disease was found to be more common in males (Table 1). The mean age of the patients was 28 +/- 7 years (range 14-45 years). The most frequent symptom was seropurulent discharge (10 patients,

50% , Table 2). The mean duration of symptoms was 28 +/- 10 days. No patients had history of pilonidal sinus surgery done in other centres. Post operative morbidity noted in 2 out of 20 patients (10% , Table 3). Patients who developed wound gaping and discharge were treated by drainage followed by leaving the wound open for secondary healing.

Secondary suturing of the wound done once the wound became culture negative. The mean length of hospital stay was 6 days. Recurrence of pilonidal sinus was noted in 1 out of 20 patients (5%, Table 3). The follow up period was upto 6 months. The

patients were asked if they were satisfied with the appearance of the surgical scar and the cosmetic satisfaction rate was found to be 90%. The average period for return to work was 23 days (Table 4).

TABLE 1

SEX DISTRIBUTION

SEX	NUMBER OF PATIENTS
MALE	18
FEMALE	2

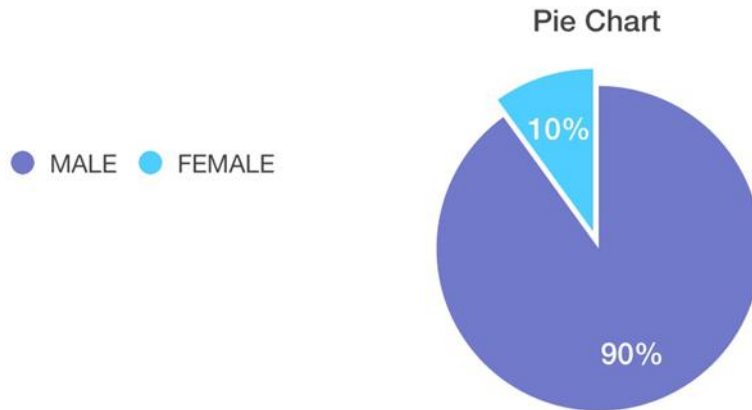


TABLE 2

PRE OPERATIVE SYMPTOMS

SYMPTOMS	NUMBER OF PATIENTS
seropurulent discharge	10
Pain	5
Local swelling	5

Interactive Chart

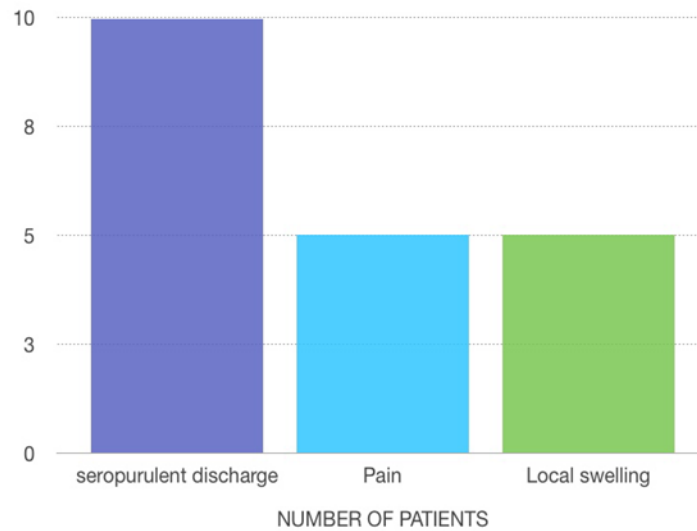


TABLE 3

POST OPERATIVE COMPLICATIONS

COMPLICATIONS	NUMBER OF PATIENTS
WOUND INFECTION	1
SEROMA	0
ABSCCESS	1
RECURRENCE	1

TABLE 4

SHORT TERM RESULTS AFTER LIMBERG FLAP

RESULTS	AVERAGE
OPERATION TIME (in minutes)	60
HOSPITAL STAY (in days)	6
DURATION OF DRAINAGE (in days)	5
POST OPERATIVE INFECTION AND ABSCESS (in %)	10
ANALGESIC USE (number of doses)	6
TIME TO WALK WITHOUT PAIN (in days)	12
TIME TO SIT WITHOUT PAIN (in days)	17
TIME OFF WORK (in days)	23

Table 5

Question Form Used In Patients Interviews At The Third Month Postoperatively

1. How many days after operation you started to sit without pain?
2. How many days after operation you started to sit without pain on toilet?
3. How many days after operation you started to walk without pain?
4. How many days after operation you started work or school?
5. How do you evaluate your operation cosmetically (VAS)?
6. Do you recommend this operation to others?

Discussion :

The ideal technique for the treatment of sacrococcygeal pilonidal sinus disease is a controversial issue. The main goal of treatment of the

sacrococcygeal pilonidal sinus disease is the selection of the most appropriate technique that causes the least number of early postoperative complications, shortens the length of hospital stay, and results in the

least number of long-term recurrences. Numerous methods have been described as surgical treatment alternatives for sacrococcygeal pilonidal sinus disease, including primary oblique excision and closure, marsupialization, secondary healing, V-Y advancement flap, Z-plasty, Limberg flap, and Karydakis flap techniques. Although several surgical methods have been defined for PSD treatment, no golden standard method is available yet. Complications that may occur as a result of surgical treatment may sometimes appear with more morbidity than the disease itself. There is still a search for optimal treatment method due to labor loss and high recurrence rate, as it affects young adult males. Extensive surgical excision is a commonly used technique in PSD treatment. The real controversy comes in about the next stage.

Marsupialization has been used in surgical pilonidal sinus treatment for many years. Marsupializing the edges of the wound is done to ensure reduction in wound size and shorten healing time. Nevertheless, it is noteworthy to mention that healing time of the patients who received marsupialization lasts up to 4 to 5 weeks, and a significant number of wound dressings is required as a result. The disadvantage led the surgeons to quit the practice of leaving the wound open, and adopt operations such as excision with primary repair. These operations are known to ensure shorter return-to work time and quick-healing compared with marsupialization, yet it is reported that they have high complication rates (wound disintegration, infection, pain). Although high wound infection rate is often linked in literature to the fact that the suture line is located at the midline, it could also be linked to the application of numerous subcutaneous sutures, placed in order to avoid possible separations in the suture line, and the tissue perfusion that decreased due to tension. This led the surgeons to flap operations that would flatten the natal cleft, keep the suture line away from the natal cleft, and reduce the tension.

Following pilonidal sinus surgery, early post operative morbidity and comfort is a vital concern. The most notable early post operative problem is wound infection. Samer et al carried out a study on 120 patients where they found that the modified Karydakis flap (MKF) group (n=460) had 2% wound infection, while the Limberg flap group (n=460) had

3%; and no significant difference was found between the groups.

Reconstruction of the defect with Limberg flap has many advantages as it is easy to perform and design, and it flattens the natal cleft with large vascularized pedicle, sutured without tension. This in turn maintains good hygiene, reducing the friction, preventing maceration, and avoiding scar in the midline. This flap procedure is found better than simple excision and closure, marsupialization, other flap procedures such as Bascombe and Karydakis.

There are many previous studies on this subject among which, Katsoulis had 25 patients, with 16 of them having complications with no recurrences and Aslam had 110 patients, with 5 of them having complications and 1 recurrence. Mentis and Urhan were other studies. Several series with the rhomboid or rhombic flap technique, including more than 50 cases, have reported recurrence rates of 1% to 7%. In our series we had a total of 20 patients among which 2 patients had complications like wound infection or flap necrosis (1) and abscess (1) which were managed subsequently. The mean pain score was 4.5 and there were fewer needs of additional analgesics apart from the standard protocol.

Conclusion :

Limberg flap for reconstruction of the defect after excision of recurrent sacrococcygeal pilonidal sinus is an effective and reliable technique, easily performed, subjectively high patient satisfaction, associated with complete cure and low incidence of post-operative complications.

References :

1. Humphries AE, James E (2010) Evaluation and management of pilonidal disease. *Surg Clin North Am* 90(1):113–124
2. Sondana K, Andersen E (1995) Patient characteristics and symptoms of in chronic pilonidal sinus disease. *Int J Colorectal Dis* 10(1):39–42
3. Hull TL, Wu J (2002) Pilonidal disease. *Surg Clin North Am* 82:1169–1185
4. Clothier PR, Haywood IR (1984) The natural history of the post anal pilonidal sinus. *Ann R College Surg England* 66(3):201–203
5. Brearley R (1955) Pilonidal sinus: a new theory of origin. *Br J Surg* 43:62–68

6. Bascom J (1980) Pilonidal disease: origin from follicles of hairs and results of follicle removal as treatment. *Surgery* 87:567–572
7. Karydakis GE (1992) Easy and successful treatment of pilonidal sinus after explanation of its causative process. *Aust NZJ Surg* 62:385–389
8. Chiedozi LC, AlRayyes FA, Salem MM, Al Haddi FH, Al-Bidwei AA (2002) Management of pilonidal sinus. *Saudi Med J* 23:786–788
9. Menten O, Bagci M, Biglin T, Ozgul O, Ozdemir M (2008) Limberg flap procedure for pilonidal sinus diseased: results of 353 patients. *Langenbecks Arch Surg* 393(2):185–189
10. Menten BB, Leventoglu S, Cihan A, Tatlicioglu E, Akin M, Oguz M (2004) Modified Limberg transposition flap for sacrococcygeal pilonidal sinus. *Surg Today* 34(5):419–423.