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Original Research Article

Limberg flap for pilonidal sinus: an institutional study

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ABSTRACT

Background: Pilonidal sinus disease is a common disorder affecting the gluteal cleft and it is notoriously recurrent. Limberg flap is a well-known surgical modality for the treatment of pilonidal sinus. This study aims at studying the surgery in a single institution.
Methods: This is a prospective study of 17 limberg flaps done from 2013 to 2016. The various demographic, clinical and surgical data are studied and compared to other studies.
Results: In this study, 17 patients of sacrococcygeal pilonidal disease underwent rhomboid excision and limberg flap reconstruction. The mean duration of symptoms was 6.52 months (2-13 months), and the mean operative time was 67.05 min with a range from 60 to 90 min. The mean post-operative stay was 6.05 days (3 to 10 days).
Conclusions: Recurrence is known and hence surgery with flap coverage not only decreases the recurrence rates, but it also makes the stay short by eliminating daily dressing. Limberg flap is an easy and efficient way with less and manageable complication.

Keywords: Flap, Limberg, Pilonidal, Rhomboid, Sinus, Sacrococcygeal

INTRODUCTION

Pilonidal means “nest of hairs” in Latin. Sacrococcygeal pilonidal disease is a fairly common disease with an incidence rate of 26 per 100,000 population.[1,2] Even though the commonest location is the sacrococcygeal region, it can be rarely seen in the umbilical, axilla and interdigital (in barbers) and other areas.[3] It is twice as common in males than in females making males in their thirties the most commonly affected subset.[1] Clinically the pilonidal disease consists of cyst, abscess or sinuses in the natal fold, with discharge being a common presenting symptom.[4]

This condition was first described by Mayo in 1833, who believed it to be of congenital aetiology, but over the years it’s been proposed that pilonidal disease is more likely acquired, and is caused by local trauma, poor hygiene in a hirsute person with deep natal cleavage.[5,6]

The treatment of pilonidal sinus is often unsatisfactory because of its high recurrence rate.[7] Multiple techniques ranging from simple excision with or without closure, to complex flap procedures have been attempted. There is no gold standard treatment method at present. Limberg described the rhomboid flap for the first time in 1946.[8] It has since gained popularity in pilonidal disease as it is easy to reproduce, and it flattens the deep gluteal cleft. Limberg flap as a way to cover wide excision of the sinus and openings has been proven to be better than primary closure, or other flap coverage methods.[8,9] Hence this study was conducted to evaluate the usefulness of limberg flap in pilonidal disease.

METHODS

The study was performed in the surgical third unit of SDM College of Medical Sciences and Hospital, Dharwad, India from June 2013 to June 2016. A total of

17 cases were done in the time period. An informed written consent was obtained prior to surgery.

Inclusion criteria

- Sacrococcygeal pilonidal disease
- Age between 18 and 60 years
- Primary or recurrent disease
- Consent given

Exclusion criteria

- Unfit for surgery
- Unwilling
- Infection/abscess

All patients were prospectively evaluated for age, gender, indication of surgery, duration of symptoms, comorbidities, location of sinus, operative time, postoperative stay and complications.

Surgery was performed under spinal anaesthesia with patient positioned prone on a cushion bed with their buttocks strapped using an adhesive plasters so as to spread them apart.

Once positioned, the surgical area was painted with povidone iodine. The rhomboid flap was marked so as to be able to excise all of the pits and sinuses enbloc. Care was also taken to leave minimum midline scar (Figure 1).

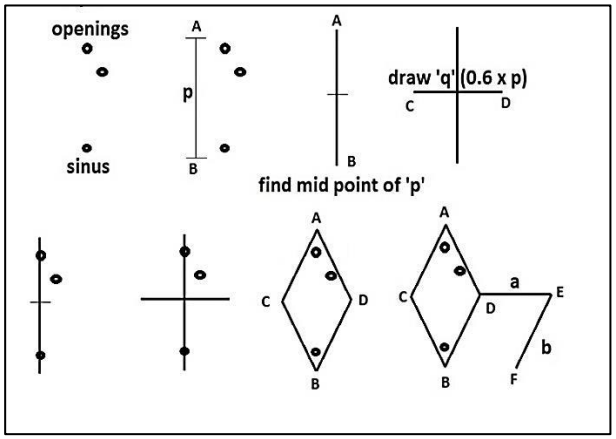

Figure 1: General schematic of creating a limberg flap.

The flap was marked in the following way, a vertical line AB was drawn just to the left of midline so as to incorporate the midline sinus and the distal most opening, the length (p) was noted, midpoint of this line was marked and a perpendicular line CD of length q (60% of p) was drawn at the midpoint so as to transect the previous line. Once all four corners were identified, a rhomboid ADBC was drawn. The horizontal diagonal CD was extended till E, where DE equals AC. The line EF was drawn parallel to DB with length equalling AD.

Once the flap was drawn the incisions were taken and deepened using electrocautery till the fascia over sacrum and the fascia over gluteal muscles was reached, so as to remove the sinus and all the lateral openings enbloc. Tissue thus removed was sent for histopathological examination.

The flap was mobilised off of the fascia over gluteal muscles so as to be able rotate it without tension. A suction drain (size 16F) was always placed before closure. Once rotated the flap was sutured in place using absorbable sutures. Skin was approximated using fine nylon suture with vertical mattress sutures with utmost care being given for epithelial approximation and prevention of step formation (Figure 2).

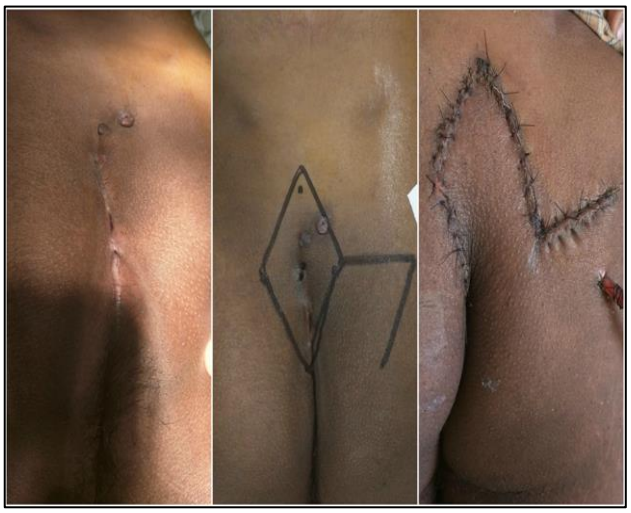

Figure 2: Photographs of the midline sinus with lateral pits, flap design and post-op healing.

Post operatively patient was advised to lie prone for 24 to 36 hours, then on laterally for the next two days. He/she was allowed to lie supine after that. Mobilisation was encouraged as early as possible, but prolonged sitting was discouraged. Drain output was documented every day and it was removed once the drain was less than 20ml/24hrs. Patient was discharged on the day of drain removal. Sutures were removed on the 10th postoperative day.

RESULTS

In this study, 17 patients of sacrococcygeal pilonidal disease underwent rhomboid excision and limberg flap reconstruction. Mean age of the patient was 25.41years, with a range from 18 to 38 years. Out of the 17, 16 (94.1%) were male and 1 (5.8%) was female. There were 12 (70.58%) with single midline sinus whereas 5 (29.41%) with multiple midline sinuses. Among comorbidities, 8 (47.05%) had hirsute nature, 1(5.8%) was obese and 5 (29.41%) were smokers. 3 (17.64%) presented to us with itching, 4 (23.52%) with pain and 10 (58.8%) had discharge. The mean duration of symptoms was 6.52 months (2-13 months), and the mean operative

time was 67.05min with a range from 60 to 90 min. the mean post-operative stay was 6.05days (3 to 10 days). (Table 1).

Table 1: General, demographic and clinical data.

Variable	Value
Age	25.41 years (18-38)
Gender	
Male	16 (94.1%)
Female	01 (5.8%)
Number of sinuses	
Single midline	12 (70.58%)
Multiple midline	5 (29.41%)
Comorbidities	
Hirsute nature	8 (47.05%)
Obesity	1 (5.8%)
Smoking	5 (29.41%)
Symptoms	
Itching	3 (17.64%)
Pain	4 (23.52%)
Discharge	10 (58.8%0
Duration of symptoms	6.52 months (2-13)
Operative time	67.05 min (60-90)
Post op stay	6.05 days (3-10)

Table 2: Complications.

Hematoma	0
Superficial skin necrosis	3 (17.64%)
Wound gaping	0
Wound infection	1 (5.8%)
Seroma	2 (11.70%)
Flap necrosis	0
Recurrence	0

Out of the 17 cases that were operated, 3(17.64%) developed superficial skin necrosis at the tip of the rhomboid flap (<1cm), 2 (11.70%) developed seroma postoperatively which resolved with conservative treatment, and 1(5.8%) type-1 diabetic female developed wound infection which was treated by laying open of a single suture and allowing to heal by secondary intention. None of them required any surgical intervention. No recurrences were noted in the follow up period ranging from 3 months to 2 years (Table 2).

DISCUSSION

Pilonidal sinus is a chronic bothersome disease that frequently affects males in their 2nd or 3rd decade. It's not only a cosmetic problem but can also lead to loss in work hours because of its recurring nature.[1,2,10] It occurs because of subcutaneous accumulation of hair causing inflammation and infection. Many non-operative techniques have been tried and since abandoned as their surgical alternatives have proven themselves much better.[11,12] Among the surgical options the flap coverage procedures provide immediate closure and place the scar away from the midline hence probably causing reduced recurrence and do away with prolonged dressings. Limberg flap is preferred as it's easy to create and is well vascularised. It effectively obliterates dead space and scar in the midline and hence is best suitable for chronic sinuses with multiple midline and lateral sinuses. There is also reduced recurrence and complications associated with it than other flaps.[13]

Present study is comparable with multiple other similar studies. We had a total of 17 patients with a mean duration of stay of 6.05 days, and a complication rate of 29.41%, with no recurrence yet. Katsoulies IE et al had a total of 25 patients with hospital stay of 4.0 days and complication rate of 16%.[14] Akin M. et al had a total of 411 patients with mean hospital stay of 3.2 days and a complication rate of 15.75% with recurrence rate of 2.91%. Srikanth KA et al has 30 patients, mean hospital stay of approximately 10 days and a complication rate of 20%.[15]

The results are also similar in the demographic parameters of age, sex, sinus location and comorbid conditions. We would like to acknowledge that the number of patients though small in relation to some studies is still significant enough to draw some basic conclusions.

CONCLUSION

Pilonidal sinus disease is a common but recurring problem in young males, with most of them being hirsute and some requiring sitting for prolonged periods of time during their jobs. Recurrence is known and hence surgery with flap coverage not only decreases the recurrence rates, but it also makes the stay short by eliminating daily dressing. Limberg flap is an easy and efficient way with less and manageable complication. It is especially useful in cases where there are multiple sinuses and lateral openings. The reduced stay and less recurrence rate means that the patient can go back to productive life early.

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