

Research Article

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Limberg flap reconstruction following rhomboid excision of the sacrococcygeal pilonidal sinus

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ABSTRACT

Background: Pilonidal sinus disease has been treated with various techniques. There is still no consensus about treatment. However, a long list of surgical techniques available reflects the inability to find an ideal procedure for the treatment. The rhomboid flap of limberg is a transposition flap that has been advocated for treatment of this condition. The objective of this study was to evaluate the limberg flap reconstruction for pilonidal sinus in terms of complications, hospitalization time, days to return to work and recurrence in Indian rural setup.

Methods: Patients with simple, complex and recurrent pilonidal sinus were included in the study. Patients presenting with acute abscess were excluded. Patients were followed for a period of three year to report the recurrence.

Results: Total 26 patients, with pilonidal sinus disease were treated with rhomboid excision and limberg transposition flaps. All sinus tracts were resected en bloc, and the limberg flap was prepared from the gluteal region and transposed to fill the defect. There were 22 males (80%) and 4 females (20%) with a mean age in males 28.6 years and in females 21.6 years. The mean duration of symptoms was 10.4 months. Mean operative time was about 70.57 minutes. Full primary healing was obtained in 20 patients, 6 patients presented with post-operative complications. Minor infection occurred in 4 patients. 3 patients had minimal necrosis of flap edge and partial gaping of flap. 2 patients developed seroma. But all these complications required no additional treatment except secondary suturing in one patient. The average hospital stay was 4 days. Most patients returned to work within 3.23 weeks. Follow up period was 3 year and no recurrence reported.

Conclusions: Limberg flap following rhomboid excision of the sinus area is worth to be considered as the surgical treatment of choice for sacrococcygeal pilonidal sinus disease.

Keywords: Pilonidal sinus, Recurrent pilonidal sinus, Limberg flap, Rhomboid transposition flap, Fasciocutaneous flap

INTRODUCTION

Pilonidal sinus is a common disease of the young adults. Most frequently seen in the sacrococcygeal region. Estimated incidence is 26 per 1, 00,000 people.¹ It generally presents as an abscess, cyst or sinus tracts with or without purulent discharge in the presacral region. Men affected more often than women, rarely seen before puberty as well as after the age of 40 years.²

Pilonidal sinus is not a major problem in terms of surgical techniques. However, considering the age group and gender it affects, it is a grave disease that can cause a significant loss in labor and earning and can cause disruption of the educational activities. Literature suggested the various surgical methods to treat sacrococcygeal pilonidal sinus disease like good hygiene of the area with clipping of hairs, wide excision of the area and packing, excision and primary closure, marsupialization, and newer flap procedures, but none is widely accepted.³ Recurrence ranged from 1-40 %

regardless of the technique used.⁴ It is the main concern in the treatment. Poor body hygiene, obesity, smoking, Male sex ,family tendency, sinus number, and the surgical procedures performed have been confirmed in a number of studies as primary risk factors for postoperative complications and recurrence.⁵

Limberg in 1946 first designed Limberg rhomboid flap for sacrococcygeal pilonidal sinus. He described a technique for closing a 60° rhomboid shaped defect with a transposition flap which was sutured away from the midline.⁴ This flap was easy to perform. It avoids scarred skin in the midline, reducing sweating, maceration and erosions in the natal cleft. Literature suggest that reconstruction by limberg flap following rhomboid excision of the sinus area had better outcome compared to primary closure and other flap procedures with very low complication and recurrence rates.^{4,6}

Hence we conducted a study in our rural setup to evaluate the usefulness of limberg flap procedure in sacrococcygeal pilonidal sinus, complications, long-term recurrence rates and patient compliance following the procedure.

METHODS

A prospective study was done in surgery department of MIMSR Medical College and hospital, Latur, Maharashtra, India from August 2011 to November 2012. All patients with simple, complex and recurrent pilonidal sinus were included in the study. Patients presenting with acute pilonidal abscess were excluded from the study. Shaving of the surgical area was done just before surgery, and broad spectrum antibiotics given to all patients intravenously just before induction. All procedures were done under regional anesthesia. Patient was placed in prone Jackknife position. Buttocks were retracted laterally with adhesive tape.

Rhomboid ABCD including the pilonidal sinuses was marked such that the all the sinus fall within the perimetry of rhomboid. The long axis of the rhomboid A-C marked in midline, C being close to perianal skin, A placed so that all diseased tissues can be included in the excision. The line B-D transects the midpoint of A-C at right angles and is 60 % of its length. D-E is a direct continuation of the line B-D and is of equal length to the incision B-A, to which it will be sutured after rotation. E-F is parallel to D-C and of equal length. After rotation E-F sutured to A-D. (Figure 1) The area ABCD with all equal sides was excised in a rhomboid fashion down to presacral fascia and laterally up to gluteal fascia. (Figure 2) The limberg fascio-cutaneous flap was raised and transposed to completely cover the defect. (Figure 3) Subcutaneous tissue was approximated with vicryl 3-0 and skin was approximated by interrupted ethilon 3-0 stitches.

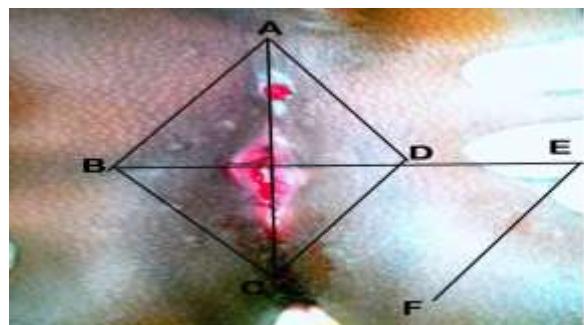


Figure 1: Marking of rhomboid excision and flap.



Figure 2: Excision done flap being raised.



Figure 3: Final outcome after surgery.

Vacuum drain was kept. Antibiotics were given for 3 days initially intravenously followed by oral route for 7 days. Operative time was recorded from the time of incision to the end of wound closure. Postoperative hospital stay was noted with the day of surgery being day zero. There were no restrictions on postoperative activity, although patients were advised not to lie on their backs for the first two days. Drain was removed when the output was below 10 ml/24 hours. The patients were reviewed on 5th and 10th postoperative days for wound examination. Stitches removed on day 10. The hygiene and regular shaving of the presacral area and buttocks was advised. Patients were followed in the outpatient department once a month for first three month followed by every three month for year and every six month for next year.

RESULTS

The study consisted of 26 patients. Majority were males 22 (80%) and 4 females (20%), with a mean age in males 28.6 years and in females 21.6 years (range 18-39 years). The mean duration of symptoms was 10.4 months (range 3-25 months). Mean operative time was about 70.57 minutes (range 44-100 minutes). Admission was usually for 4 days (range 3 to 7 days). The mean duration of post-operative stay in the hospital was 3.4 days in patients without complications. Hospital stay was increased to average 6.5 days in patients who had some complications. Average time taken to return back to routine work was 3.23 weeks (range 3-5 weeks). The overall complication rate was 23.07% (n=6). Twenty patients (76.92%) had full primary healing without any complication. Three (11%) patients had minimal epidermolysis of flap edges. Four (15%) patient developed wound infection, three (11.5%) of these four patient developed wound dehiscence. However two healed completely with conservative treatment on an out-patient basis. One patient required secondary suturing which was done after 10 days. Two patient developed seroma which was asymptomatic and hence no intervention was required. None of the patients developed flap necrosis. None of the patient has had recurrence over three year follow up period.

DISCUSSION

Pilonidal sinus disease is an acquired condition affecting young adults with high rate of morbidity that leads to long term loss of labor and earnings. Our patients were also in the young age with a mean age in males 28.6 years and in females 21.6 years and majority of them were males 22 (80%).² Our patients presented late to the hospital for surgery the mean duration of symptoms was 10.4 months (range 3-25 months). This may attribute to rural area to which patients belong and poverty in the region.

There is still no consensus about treatment of pilonidal sinus disease. Surgical treatment is preferred over conservative treatment. However, a long list of surgical techniques available reflects the inability to find an ideal procedure for the treatment approved by all surgeons.⁷ The goals of the ideal procedure should include short hospital stay, rapid healing of wound, less painful postoperative period, low risk of recurrence, low morbidity with few wound-management problems and allow the patient to resume normal daily activities as early as possible.⁸ No technique fulfills all of these criteria. Since the source of the disease is thought to be natal cleft and deep intergluteal sulcus, the aims of the

flap techniques should be natal cleft flattening, lateralization and fulfilling the defect without tension. Reconstruction of the defect with limberg flap has many advantages as it is easy to design, perform and learn even by general surgeons. It flattens the natal cleft with large vascularized pedicle, sutured without tension. Midline dead space and scar is avoided. This eventually helps in maintaining good local hygiene, reducing the friction between buttocks, preventing maceration. The use of this local flap accelerates healing.

Postoperative complications of this procedure like surgical site infection, epidermolysis at the tip of the flap, flap necrosis, seroma, and hematoma are well known.⁹ In the literature, the rate of these wound-related complications after Limberg flap varies from 4.7% to 15.9%. The complication rates have been reported to reach 15.9% in a small series and fall to as low as 4.7% in a large series.¹⁰ In the present series, only 4 of our patients had wound infection. Three patients had epidermolysis at wound edges, most marked at tip of the flap. This may be because of a larger size flap to fill the extensive defect in recurrent cases of pilonidal sinus disease.¹¹ El-khadrawy also reported the similar rate of this complication in his work. In our study mean operative time was about 70.57 minutes (range 44-100 minutes). We noted that patients with recurrent disease and with multiple sinuses took more time for the operation. In our study the duration of hospital stay was usually for 4 days (3 to 7 days). The mean duration of post-operative stay was 3.4 days in patients without complications whereas hospital stay was increased to average 6.5 days in patients who had some complications. In our study Mean time to return to normal activity was 3.23 weeks (range 3-5 weeks). Patients who had complications took more time to return to normal activity. This is in contrast with the findings of Urhan et al and Bozkurt and Tezel, who reported the mean length of hospital stay as 3-7 and 4-1 days, and the mean time to return to normal activity as 7 and 17-5 days, respectively.^{12,13} Recurrence is the main concern associated with all surgeries described for treatment of pilonidal sinus. This ranged from 21.4% to 100% for incision and drainage, 5.5%-33% for excision and opens packing, 8% for marsupialization, 3.3%-11% for Z plasty, 4% to 25% after primary closure.¹⁴ Recently number of series have been reported using this technique with minimal complications (Table 1). Our results with the limberg flap are therefore comparable with other series in the context of recurrence rate of 0-5%. But overall complication rate (23.07%) is on higher side in our study when compared to others which range from 0-16%.^{12,15,16} In our series we have not recorded any recurrence after three years of follow up.

Table 1: Summary of results with Limberg flap technique in various series.

Authors	Patients (n)	Hospital stay (days)	Complications (%)	Recurrence (%)
Urhan MK et al ¹⁸	102	3.7	7	4.9
Katsoulis IE et al	25	4	16	-
Akin M et al ¹⁶	411	3.2	15.75	2.91
Our series	26	4	23.07	-

CONCLUSION

The technique of reconstruction by limberg flap following rhomboid excision of the sinus area is worth to be considered as the surgical treatment of choice for sacrococcygeal pilonidal sinus disease.

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Ethical approval: The study was approved by the institutional ethics committee

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