

LIMBERG FLAP RECONSTRUCTION FOR PILONIDAL SINUS: OUR EXPERIENCESuresh Chandu¹, Ramya Y²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: OBJECTIVE: to study the outcome of Limberg flap reconstruction in pilonidal sinus disease. **STUDY DESIGN:** Prospective study. **MATERIALS AND METHODS:** 32 patients with pilonidal sinus disease underwent rhomboid excision with Limberg flap. Duration of operation, postoperative pain, duration of hospital stay and postoperative complications were noted. Follow up of all patients was performed on an out-patient basis. **RESULTS:** There were 30 males (93.75%) and 2 females (6.25%), with a mean age of 28 years. The mean duration of symptoms was 6 months. Mean operative time was about 45 minutes. Mean pain score (VAS scale), was 3.65. The mean length of hospital stay was 4 days and most patients returned to work within 3 weeks. Three patients presented with post-operative complications of which one patient had recurrence (3%). **CONCLUSION:** Limberg flap technique is an effective procedure for pilonidal sinus disease associated with fewer complications and an easily mastered technique.

KEYWORDS: Pilonidal sinus, Rhomboid excision, Limberg flap.

INTRODUCTION: Pilonidal sinus is a common condition which causes significant morbidity. Men are affected twice as often as women and the condition is most frequent in the third decade of life. It is most commonly seen in the sacrococcygeal region,¹ which usually presents as a cyst, abscess, or one or more sinus tracts with or without discharge in the upper part of the natal cleft.²

It is caused by local trauma, poor hygiene, excessive hairiness, and presence of deep natal cleft.^{3,4} The management involves surgical or nonsurgical treatment modalities. Surgical techniques include laying the track open, wide excision with open wound, wide excision with marsupialization, excision with primary midline or asymmetric closure and techniques involving various flap procedures.

Limberg procedure is a safe and reliable technique in the treatment of sacrococcygeal pilonidal sinus disease. When performed according to the appropriate surgical principles, it is associated with lower complication and recurrence rates.⁵ This study was carried out to evaluate the usefulness of Limberg Flap technique in treatment of pilonidal sinus in our setup.

MATERIALS AND METHODS: From July 2013 to June 2014, 32 patients with pilonidal sinus disease were operated by rhomboid excision with Limberg flap in the department of general surgery, Victoria Hospital. Patients with primary & recurrent pilonidal sinus disease underwent this operation. The clinical presentation included chronic discharging sinus, pain or recurrent abscess formation.

An informed consent was taken. All patients underwent operation in the prone position under spinal anesthesia. Duration of operation, postoperative pain, duration of hospital stay and postoperative complications were noted. Patients were advised to return to normal activities after removal of stitches, after about 10 days. Follow up of all patients was performed on an out-patient basis.

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OPERATIVE TECHNIQUE: Surgery was performed under spinal anesthesia. Patient was placed in jackknife position with buttocks strapped. After adequate shaving and skin preparation, area to be excised and the flap lines were mapped on the skin (Figure-1).

The rhomboid incision including the sinus and its extensions was made down to the pre-sacral fascia. Flap was constructed by extending the incision laterally and down to the fascia of the gluteus maximus muscle (Figure 2). The diseased area was removed en bloc. Thus a rhombic shaped fasciocutaneous flap was developed. The flap was transposed into the rhombic defect without tension (Figure-3).

Suction drain was placed in the wound cavity, through a separate stab incision. Subcutaneous tissue was approximated with absorbable suture material. Skin was closed with non-absorbable suture material (Figure-3). Antibiotics were given for five days, initial intravenous and then oral. The suction drain was removed after 48 hrs. Sutures were removed on 10th post-operative day.

RESULTS: The present study consisted of 30males (93.75%) and 2 females (6.25%), with a mean age of 28 years (range 20–36 years) out of which two patients presented with recurrent disease which was previously managed by wide excision with primary closure. The mean duration of symptoms was 6months (range 3-9 months).

Mean operative time was about 45 minutes (range 40-50 minutes). Pain score, as calculated by VAS (visual analogue scale), had a mean of 3.65 (range 3-5). The mean length of hospital stay was 4 days (range 3-5 days) and most patients returned to work within 3 weeks. 28 patients (87%) had full primary healing without any complication.

Two (6%) patients developed wound infection. One patient had necrosis of flap tip (3%). One patient had recurrence (3%) due to improper hygiene, who later underwent conservative management for the same. The distribution of patients according to demographic characteristics, history of the disease, operative time and postoperative outcome has been described in Figure 4 and Table 1-3.

DISCUSSION: Pilonidal sinus is characteristically a blind epithelial tract (the sinus) which is most commonly seen in the sacrococcygeal region¹ and also been described in the axilla, suprapubic area, periumbilical zone and between the fingers of the hand⁶. The aetiology and pathogenesis of pilonidal sinus is still a matter of debate.

According to present view it is basically caused by excessive hairiness, poor hygiene and humidity.⁷ Increased depth, narrowness of the natal cleft and the friction movements of the buttocks paves the way for loose hair to collect and insert in deep cleft.⁶ The hair is perceived as a foreign body, initiates an inflammatory response and can then lead to a pocket of infection leading to abscess or sinus formation.⁸ Patient usually presents with pain, abscess in the natal cleft or discharging sinus by spontaneous rupture of the abscess.

In our study, majority of patients presented with painful discharging sinus (75-87%). So a patient presenting with signs of infection and abscess formation should be treated initially with antibiotics and abscess drainage which later on should be managed by definitive technique. The surgical treatment should intend towards removing all the sinus tracts as well as the predisposing factors that contribute in the formation of pilonidal sinus.

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The goals of the ideal procedure for the treatment should be reliable wound healing, a low risk of recurrence, a short period of hospitalization, minimal inconvenience to the patient, and low morbidity with few wound-management problems.^{9,10} Also, treatment should allow the patient to resume normal daily activities as quickly as possible.

Recurrence is the main problem associated with all surgeries described, which ranged from 21-100% for incision and drainage, 5.5-33% for excision and open packing, 8% for marsupialization, 3.3-11% for Z plasty.^{11,12} Flap techniques have been associated with lower complication and recurrence rates. The advantage of Limberg flap reconstruction is that it is very easy to perform and design. It flattens the natal cleft that eventually helps in maintaining local hygiene, avoids hair insertion by reducing the friction between buttocks, reducing humidity, maceration, erosions and scar formation at the natal cleft.

Any midline dead space is eliminated and a midline scar is avoided. It is a particularly useful technique for complex sinuses with multiple pits and extended tracts where radical excision leaves a large defect.¹⁰ This operation is also suitable for cases where other simpler operations have failed. The use of local flap accelerates healing. The rhomboid flap of Limberg is a transposition flap that has been advocated for treatment of this condition. In 1946, Limberg first described a technique for closing a 60° rhombus shaped defect with a transposition flap. It is a series of communicating equilateral triangles, with all angles meeting at 60°.

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. Several series have been reported recently using this technique with minimal complications. Our results with the Limberg flap are therefore comparable with other series that have shown wound complication of 0-16% and recurrence rates of 0-5%.^{2, 6-8, 10}



Fig. 1: The area to be excised was marked



Fig. 2: Rhomboid excision of the sinus with flap transposition



Fig. 3: Flap reconstruction

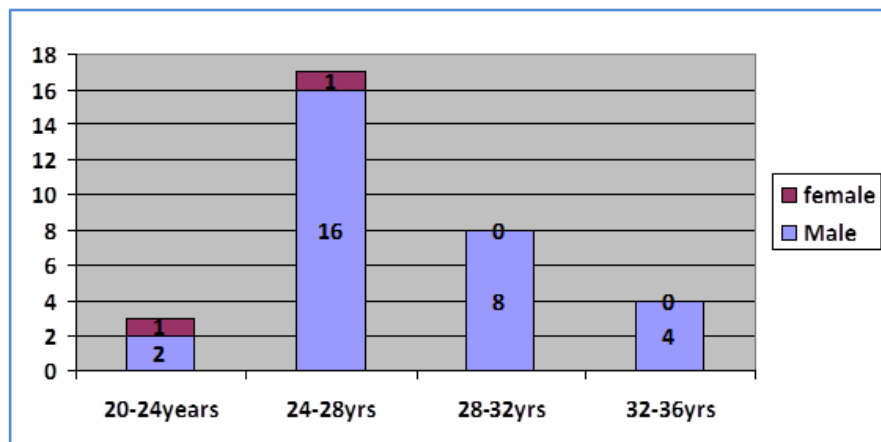


Fig. 4: Patient demographics

Clinical presentation	Number of patients (%)
Pain	28 (87.5%)
Discharge	25 (78%)
Abscess	6 (18.75%)

Table No. 1: Modes of Presentation

	Range
Operative time	40-50 minutes
Pain score (VAS)	3-5
Hospital Stay	3-5days
Drain removal	2 nd -4 th day
Suture removal	10 th day

Table No.2: Operative Data

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	Number of patients (%)
Wound infection	2 (6%)
Flap necrosis	1(3%)
Recurrence	1(3%)
Table no. 3: Postoperative complications	

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