

# An Experience of Limberg Flap for Pilonidal Sinus

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## ABSTRACT

**Background:** Pilonidal sinus disease has been treated for a long time with conventional open excision technique. The rhomboid flap of Limberg is a transposition flap that has been pleaded for treatment of this condition.

**Study Design:** Clinical trial

**Duration & place of study:** Department of Surgery: Choudary Akram Teaching & Research Hospital, Lahore from January 2013 - December 2014.

**Methods:** We present our experience with the Limberg technique for both primary and recurrent pilonidal sinuses. Total of 54 patients, with pilonidal sinus disease were treated with rhombic excision and Limberg transposition flaps. All sinus tracts were resected en bloc, and the fasciocutaneous Limberg flap was prepared from the gluteal region and closed it with a suction drain.

**Results:** Full primary healing was obtained in 54 patients, 1 patient had epidermolysis and 2 had minor infection. But all these complications healed uneventfully. The average hospital stay was 4-5 days. Follow up period was 2 year and no recurrence.

**Conclusions:** Limberg transposition flap is a promising surgical technique

**Keywords:** PNS (Pilonidal sinus), Surgical outdoor (SOPD), Limberg Flap

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## INTRODUCTION

Pilonidal sinus (pilo means hair, nidus mean nest) means sinus containing dead hairs. Pilonidal occurs most commonly in Intergluteal<sup>6,7</sup> area (natal cleft) but also found in umbilicus<sup>1</sup>, Amputation<sup>4</sup> stump, breast<sup>3</sup>, Axilla<sup>2</sup> and interdigital region especially in barber<sup>10</sup>. The incidence is variable and is most common in hairy young men Male to female ratio is 8:1 and most frequently found in 18- 35 years of age .Pilonidal sinus usually present as a cyst or abscess or one or multiple sinuses with or without discharge mostly in intergluteal cleft. The aetiology<sup>8,10</sup> of pilonidal sinus disease has been a matter of debate. There are two theories of this origin as Congenital (ii) Acquired but now opinion is shifted towards, acquired theory. A more convincing view is that PNS is caused by repeated local trauma, poor hygiene, excessive hairiness, obesity, prolonged sitting and presence of deep natal cleft. That is why disease is more common in jeep drivers also called as jeep seat disease. Pilonidal sinus disease has been treated in many ways in the past but with frequently unsatisfactory results of recurrence and most widely accepted treatment is still not established. In this regard, low recurrences rate, shorter hospital stay, low cost, menial inconvenience and time off work are important consideration<sup>8</sup>. Surgical techniques include

lay open the tract, wide excision of tract with secondary healing<sup>5</sup>; wide excision with marsupialization excision with primary midline closure, asymmetric closure<sup>9,11</sup> and techniques involving various flaps<sup>12,13,14,15,16</sup>.

All surgical procedures have pros and cons Limberg flap is a transposition flap, first described by limbering in 1946. The advantage of this reconstruction is that: It is very easy to perform and design. It flattens the natal cleft with a wide & well vascularized pedicle that can be sutured without tension. That eventually helps in maintain local hygiene , avoids hair insertion by reducing the friction and negative pressure between buttocks .Moreover, it also reduces humidity , maceration, erosion and scar formation at the natal cleft if performed according to appropriate surgical principles. Limberg flap is a safe and reliable technique with lowest recurrence rate and complications. This study was carried out to evaluate the usefulness of limberg flap techniques to treat Pilonidal sinus in periods of two years in surgical department of Ch. Akram Teaching & Research Hospital, Lahore.

## MATERIAL AND METHODS

We performed this procedure on 54 patients from February 2013 to December 2014. Patients having primary or recurrent pilonidal sinus disease were treated by Limberg Flap technique. There was no special inclusion or exclusion criteria .Patient who had pilonidal abscess were treated first with incision

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drainage and then by Limberg Flap .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 at the skin (Fig.1) Flap is constructed by extending the incision laterally and down to the fascia of the gluteus maximum muscle. The diseased area is removed en bloc. Flap is constructed by extending the incision laterally and down to the fascia of the gluteus maximum muscle. 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 (Fig. 2). 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 (Fig. 3). Antibiotics are given for five days, initial intravenous and then oral. The suction drain is removed after 72 hrs. Sutures are removed on 14th post operative day. Patients were advised to return to normal activities after removal of stitches about 14 days but avoid excessive physical strain and sport for 6 – 8 weeks. All patients were followed up in SOPD first after every month for 3 months and then twice a year for a period of two years.

**RESULT**

Total 54 Patients were included in this study. 48 male and 6 were female age 18 -35 mean age 21.51 patients have healing without any complication. One patient has epidermolysis and 2 patients have minor infection. All these minor complications settled with conservative treatment. The length of hospital stay

was in the range of 4-5 days and most patients returned to work after 3 weeks. The stitches were removed after 14 days. There is recurrence of pilonidal sinus disease in 54 patients with follow up of two years.

Fig.1: Area to be excised is marked



Fig. 2: Excision done flap rotated



Fig.3: After completing of surgery showing tube drain



Table 1: Summary of results with Limberg flap in various studies

Authors	Patients	Hospital stay( day)	Complications%	Recurrence%
Urhan MK <i>et al</i> 2002	102	3.7	7	4.9
Mentes BB <i>et al</i> 2004	238	2-3	2	1.26
Katsoulis IE <i>et al</i> 2006	25	4.0	16	0
Akin M <i>et al</i> 2008	411	3.2	15.75	2.91
Liaqat AM 2014 (present study)	54	4-5	6	0

**DISCUSSION**

Pilonidal sinus is characteristically a blind epithelial tract (the sinus) situated in the skin of the natal cleft, a short distance behind the anus and generally containing hair<sup>8</sup>. The etiology 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<sup>8,9</sup>. Other factors affecting the incidence are increased sweating associated with sitting and buttock friction,

obesity and local trauma, Increase 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. The cleft is further prone to the collection of loose hairs, by increased sweating associated with sitting and buttock friction, poor personal hygiene, obesity, and local trauma. The hair is perceived as a foreign body<sup>5,6,10</sup>, initiates an inflammatory response and can then lead to a pocket of infection leading to abscess or sinus formation. 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. The goals of the ideal procedure for the treatment of this disease should be reliable wound healing with a low risk of recurrence, a short period of hospitalization, minimal inconvenience to the patient, and low morbidity with few wound-management problems. Also, treatment should allow the patient to resume normal daily activities as quickly as possible. The advantage of this reconstruction<sup>13,14,15,16</sup> is that it is very easy to perform and design. It flattens the natal cleft with a large, well-vascularised pedicle that can be sutured without tension. 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. The healing with secondary intention would require prolonged supervised wound care. This operation is also suitable for cases where other simpler operations have failed. The use of local flap accelerates healing. Several series<sup>13,14,15,16,17,18</sup> have been reported recently using this technique with minimal complications (Table- 1). Our results with the Limberg flap are therefore comparable with other series that have shown wound complication and recurrence rates of 0–16% and 0–5% respectively. 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.

## CONCLUSION

The results of our series support the wide excision and Limberg flap rotation as a preferred treatment of the disease. The technique can be mastered easily and provides an effective procedure for primary as well as recurrent disease. Few complications associated with it can further be reduced by meticulous skin closure and preventing skin edge inversion, especially at the lower midline. Also the flap should be wide enough to completely obliterate the midline natal cleft.

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