

# Effectiveness of Limberg Flap in Recurrent Chronic Pilonidal Sinus Disease

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## ABSTRACT

*Objective* To describe outcome of Limberg flap in chronic recurrent pilonidal sinus disease.

*Study design* Case series.

*Place & Duration of study* This study was done at Surgical Unit-III, Liaquat University Hospital, Hyderabad (LUMHS) from February 2005 to March 2012.

*Methodology* Through sampling of convenience all patients irrespective of age and gender with chronic recurrent pilonidal sinus disease were included.

*Results* During the study period 25 patients were enrolled. Two patients were lost to follow-up and were excluded from final analysis. All 23 patients were males, with mean age of 27 year. The mean operative time was 52 minutes and mean hospital stay of 7 days. None of the patients developed flap failure. No recurrence was noted for a mean follow up period of 10 months (range 9-12 months)

*Conclusion* The Limberg flap for recurrent chronic pilonidal sinus disease was safe and easy to perform procedure with minimum morbidity and early recovery.

*Key words* Recurrent pilonidal sinus, Limberg flap, Rhomboid excision.

## INTRODUCTION:

Chronic pilonidal sinus was first described by Anderson more than a century back.<sup>1</sup> It is characterized by the presence of epithelial tract (the sinus) situated at natal cleft (the pit) and containing tuft of hairs, hence the name given pilonidal sinus, which in Latin means “nest of hairs”. The disease affects young adults, with male preponderance and occurs most commonly at natal cleft although can also occur in axilla, interdigital clefts, suprapubic region, peri-umbilical region and even at external genitalia.<sup>2-5</sup>

Many theories have been postulated to discuss the causes of high recurrence and include an unrecognized sinus tract at the time of previous excision, or more importantly an intergluteal cleft

anatomy that leads to the accumulation of perspiration, hairs and repeated friction due to rolling action of buttocks promoting the hairs to grow.<sup>6,7</sup> This incites the tissue reaction and reappearance of sinuses.

Patients with recurrent pilonidal disease present a challenge for the surgeons. Tissue loss, presence of fibrous tissue and previous attempts for excision limits the surgical options. An ideal procedure for this disease is expected to produce the higher rates of cure, with minimal morbidity in terms of decrease hospital stay, fewer “off the work” days of convalescent and minimum wound management problems.

The techniques developed to treat recurrent pilonidal sinus generally involves a flap procedure that achieves primary closure away from midline and obliterates the natal cleft. In this study, we present our experience with Limberg flap in the management of recurrent pilonidal sinus disease in terms of its technical details, the analysis of advantages and results.

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**METHODOLOGY:**

This prospective case series was conducted on patients with recurrent pilonidal sinus disease from February 2005 to March 2012 at Liaquat University Hospital, Hyderabad. All patients with recurrent pilonidal sinus disease were included. Patients with systemic or local comorbidities that may adversely affect the flap, were excluded.

All the patients were operated under spinal anesthesia. All patients received injection cefuroxime 1.5gm just after induction of block. Patients were placed in prone jack-knife position and rhombus shaped area of excision along with flap was mapped with a skin marker. All the sinus tracts were excised en block deep till the pre-sacral fascia in the midline and gluteal muscles laterally. A flap was then fashioned from left buttock incorporating the skin, subcutaneous fat and gluteal fascia and stitched in place (figure I, II). Patients received injection metronidazole in postoperative period along with injection cefuroxime for two days. Drains were removed on the 4-6<sup>th</sup> postoperative day and discharged at 7<sup>th</sup> post-operative day. Skin stitches were removed usually on 14<sup>th</sup> post-operative day. Patients were advised to maintain hygiene and keep the area shaved for a minimum of three months. A follow-up done in outpatient clinic at 2<sup>nd</sup>, 4<sup>th</sup>, 12<sup>th</sup> weeks postsurgery and then after completion of one year. The operative time, wound complications, hospital stay, "off the work" period and recurrence rate were recorded and analyzed using descriptive statistics.

**RESULTS:**

There were 25 patients enrolled in the study of whom two were lost to follow-up and hence were excluded from final analysis. Of the remaining 23 patients, all were males. The mean age of patients was  $27 \pm 4.71$  year (range 18-36 year). Majority of the patients had history of excision with secondary healing as the primary procedure. The mean operative time was  $52 \pm 9.95$  minutes (range 40-80 minutes). The mean hospital stay was  $7 \pm 2.14$  days (range 4-14 days). Most of the patients had uneventful recovery whereas some developed minor wound complications. None of the patients had complete or partial loss of flap. The mean "off the work" period was  $19.6 \pm 9.1$  days (range 10-40 days). By the end of one year follow up, so far none of the patients has returned with recurrence.

**DISCUSSION:**

Pilonidal sinus is a well recognized entity afflicting young and healthy individuals. It not only results in high morbidity rate because of its tendency to persist



Fig I: Proposed area of excision and flap to be fashioned marked.



Figure II: After excision and rotation of flap.

and recur again and again but also decreases the productive power. There are reports of development of squamous cell carcinoma in longstanding cases. Davis et al suggested that it takes about two decades to develop this malignancy if this disease persists.<sup>8</sup> Also some fatal complications such as necrotizing fasciitis and toxic shock syndrome have also been reported in international literature.<sup>9</sup> In the present study, only male patients were recruited by chance who presented with recurrent disease. This finding is in conformity with overall male predominance with this condition.<sup>10</sup> The mean age in our series was 27 year, this correlates well with national and international literature.<sup>11, 12</sup>

There is considerable controversy regarding the optimal treatment of this common disease. Surgical interventions are generally preferred against conservative treatment. However, a long list of surgical techniques reflects the inability to find an efficient mode of treatment approved by all surgeons.

Surgical treatment combines excision of the sinus tracts with or without marsupialization, primary closure or different flap procedures. Eryilmaz et al have advocated rhomboid excision and the Limberg flap procedure, especially in patients with recurrent or extensive disease.<sup>13</sup> The low recurrence rates, shorter hospital stay and reduced duration of incapacity for work achieved may outweigh the disadvantages related to an unfavourable cosmetic appearance following rhomboid excision and Limberg flap closure.

Postoperative complications in the form of seroma, epidermolysis at the tip of the flap and surgical site infection are well recognized. In the present series, only 5 of our patients had epidermolysis at wound edges, most marked at tip of the flap. This may be attributed to a larger free flap to fill the extensive defect or faulty technique. El khadrawy also reported the similar rate of this complication in his work.<sup>14</sup> In our study the duration of hospital stay as well as mean convalescent period was longer, 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.<sup>15,16</sup> Recurrence is the biggest problem in the treatment of pilonidal sinus. Different studies have shown variable rates of recurrence for individual procedures like 21.4 to 100 % for incision and drainage, 5.3 to 33 % for the excision-open packing technique, 6.8 to 8 percent for marsupialization and 3.3 to 11% for Z-plasty.<sup>17-21</sup> The rate of recurrence after Limberg flap is reported as 0-2%.<sup>23, 24</sup>

The rhomboid flap aims to fit and fill in the larger defect that results from the extensive excision of recurrent sinus tracts. This relocates hair follicles away from midline. It also obliterates the natal cleft and thereby addresses the etiopathological factor behind the recurrence. In the present study, none of the patients have reported back with recurrence. This is in contrast with recurrence rate of 10% reported by El khadrawy.<sup>14</sup> No recurrence is also reported in various series.<sup>11,21,22</sup> The possible reason behind this could be the extensive excision that is done in cases of recurrent disease.

The ideal procedure for the treatment of recurrent pilonidal sinus disease therefore has to be multidimensional. It must excise all the tracts, fill in the cavity, achieves a primary closure with minimum wound complications. Also, it must minimize patient's morbidity and inconvenience in terms of longer hospital stay and loss of work days. Limberg flap

procedure is one of such procedures.

#### CONCLUSIONS:

The Limberg flap was found safe, effective and reliable technique in the treatment of recurrent pilonidal disease as it was easy to perform associated with minimum morbidity and low recurrence rate.

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