



## Limberg flap a safe and reliable technique for pilonidal sinus, a single institutional experience

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### ABSTRACT:

**INTRODUCTION:** Pilonidal sinus is a common and morbid disease seen predominantly in young hairy and bulky adult male, with high recurrence rate. The management of pilonidal disease remains controversial, so our study aims to evaluate the efficiency, advantages, complications and outcomes such as wound infection, postoperative pain relief, recurrence rates, and return to work associated with wide local excision with Limberg flap reconstruction in the management of pilonidal sinus disease.

**MATERIAL AND METHODS:** This was prospective descriptive study conducted in Department of General Surgery, ESIC Medical College Teaching Hospital from March 2021 to March 2022. 20 patients with diagnosis of pilonidal sinus were included with 3 months of follow up. **RESULTS:** Total 20 patient were included in 1-year time. Mean age was 31years with 19 male patients and 1 female patient. The mean age of presentation was 31 years old (range 18–50 years old). Mean operative time was about 40 minutes (range 35-45 minutes). The mean follow-up period was 3 months.No recurrence was noted till now. **CONCLUSION;** -Limberg flap has easy learning curve with a very good and promising results with significant low recurrence rate, short hospital stay, low VAS score, early return to work, shorter complete healing duration, with high patient satisfaction and cosmetically good result, so we want to conclude that simple and recurrent pilonidal sinus treated with Limberg flap is a safe and reliable technique with good promising results.

**Key words:** modified Limberg flap , Intergluteal pilonidal sinus, discharging sinus, wide local excision

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### INTRODUCTION; -

Pilonidal sinus most commonly occurs in intergluteal region. Other site includes interdigital, umbilical region etc,. It is a common chronic inflammatory disease mainly seen in young males.Pilonidal sinus interferes with routine basic day today activity and ability to do basic work due to its high recurrence rate. For the treatment of pilonidal sinus different surgical methods have been explained, the gold standard treatment method has not yet been

described. Rhomboidexcision and Limberg flap reconstruction has an advantage over other techniques due to its low recurrence rate<sup>1</sup>.

Generally pilonidal disease presents as an abscess, cyst or single/multiple sinus tract with or without pus discharge in natal cleft upper part. Exact etiology is not known but related to the implantation of hairs into the depth of natal crease. Other factors which are contributing are poor personal hygiene, local trauma, increased sweating with sitting and friction, narrowness of



natal cleft. Pathogenesis being implantation of hair follicle leads to infection and later formation of abscess ending up in discharging sinus<sup>2</sup>.

An ideal operation should be simple and associated with minimal to no pain, should have shorter hospital stay, and should have low recurrence rate, better wound care and decrease the patient's time off-work. Limberg was a first person to describe a technique where 60° rhombus-shaped defect was closed with a transposition flap. It meets the entire requirement for being the ideal procedure for sacrococcygeal pilonidal sinus if performed according to appropriate surgical principles<sup>3</sup>.

Among these rhomboid excisions with Limberg flap inter-positioning is most commonly used. With this technique of flattening the natal cleft, a tension-free repair is made using a wide, well-vascularized flap.<sup>4</sup>

The main concern in the treatment of the patient is recurrence; the literature review suggested that it ranged from 20–40 % regardless of the technique used.

Many reasons were explained for recurrence, such as sutures in midline causing excess trauma which leads to repeated infection, accumulation of perspiration, and repeated friction with tendency of hair getting entrapped into wounds, other major cause explained were leaving behind some part tract<sup>5</sup>.

So our study was carried out to evaluate the efficiency, advantages, complications & outcomes such as wound infection, postoperative pain relief, recurrence rates, and return to work associated with rhomboid shaped wide local excision with reconstruction by Limberg flap in the management of pilonidal sinus disease.

## **MATERIALS AND METHODS; -**

This was prospective descriptive study conducted in, Department of Surgery, ESIC Medical College Teaching Hospital from March 2021 to March 2022. Total 20 patients with diagnosis of pilonidal sinus were included. Patient presented with pilonidal abscess initially incision and drainage done later elective definitive surgery carried out.

## **INCLUSION CRITERIA**

1. Patients who are willing to give written informed consent.
2. Presence of recurrent pilonidal sinus.
3. No infection at time of surgery

## **EXCLUSION CRITERIA:**

- 1] (ASA) physical status  $\geq 3$  e.g. cardiac diseases, pregnant woman,
- 2] History uncontrolled diabetes mellitus,
- 3] Patients with the unstable cardio respiratory disorder, patients with hepatic and renal insufficiency
- 4] Abnormal PT/INR, APTT, PLATELET COUNT

## **PROCEDURE**

Procedure was performed under general anesthesia. Patient placed in prone jack knife position with buttock strapped with adhesive tapes for proper exposure. Methylene blue injected to delineate sinus and to assess extent of sinus. Rhomboid incision placed and wide local excision done. Later Limberg flap raised in standard manner. i.e. by extending the incision laterally down till the fascia of gluteus Maximus muscle. The size of Limberg flap was equal to that of wide local excised rhomboid area. The fasciocutaneous flap trans-positioned medially to cover the defect without tension.





Figure 1;- pilonidal sinus with rhomboid incision marking for wide local excision



Figure 2;- after excision flap marking and Limberg flap creation



Figure 3: Limberg flap reconstruction before and after stapling

Post operatively patient advised to keep surgical site clean, and advised to avoid strenuous exercise and prolonged sitting for at least 2 weeks, advised to clean hair by cream or shaving for 1 month, and followed up for 3months.

Post-operative pain, duration of hospital stay, post-operative stay, post-operative recurrence within 3months, and duration of inability to work recorded.

#### RESULTS; -

20 patients are operated with rhomboid excision and Limberg flap reconstruction. 19 males, 1 female noted in our study (figure 4). The mean age of presentation was 31 years old (range 18–50 years old) (figure 5). Mean operative time was about 40 minutes (range 35-45 minutes). The mean follow-up period of our study was 3 months.

In our study around 70% are new case, 20% cases are recurrence, and 10% case post incision drainage case (table 1). Most of the patient has pus discharge as main complaints (90%) followed by pain over sinus (50%) (Table 2).

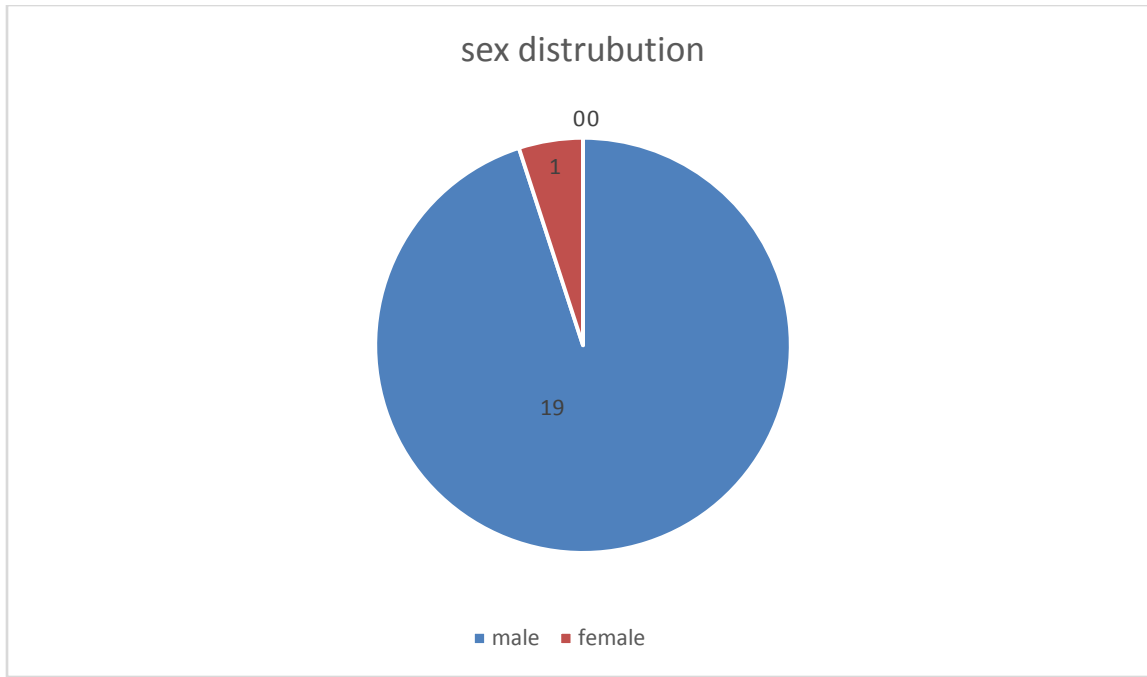
The mean operative time was ranged from 35 to 45 minutes (mean 40min). Hospital stay was

around 4 to 5 days. The stitches were removed after 12–15 days and drain removal between 7-9 days (Table 3).

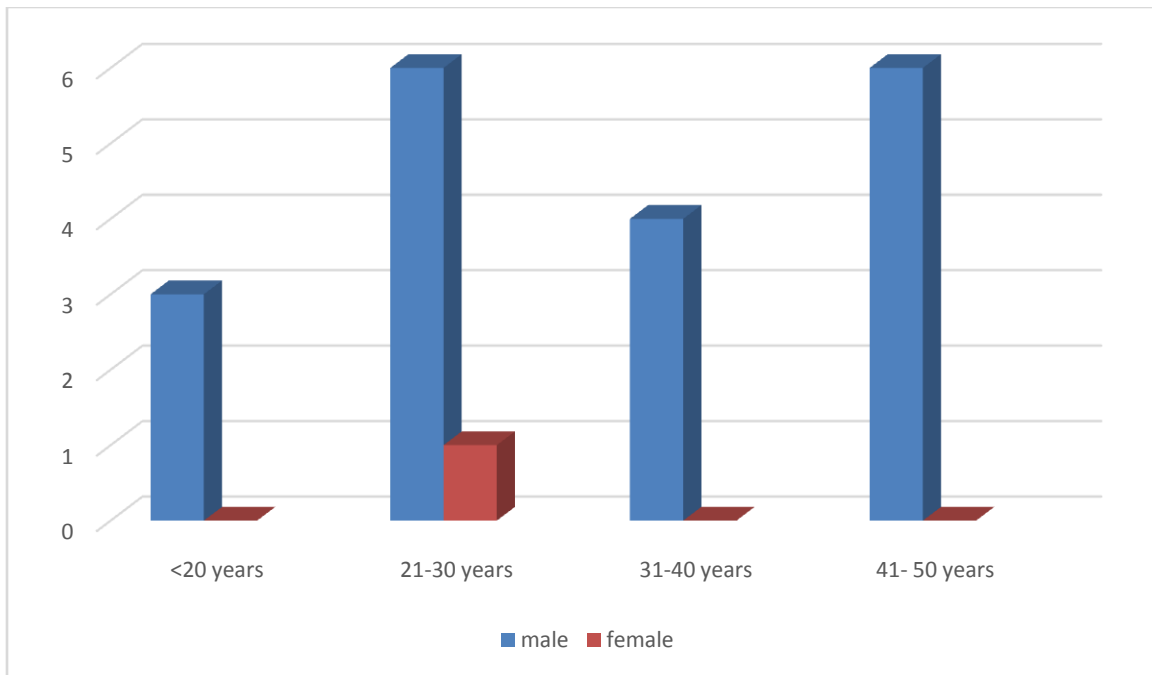
Seroma developed in one patient, which was managed by conservative measures. One patient developed necrosis at the tip of the flap, mild gaping noted in one patient treated conservatively with regular dressing, no patient developed recurrent lesion in close 3 months postoperatively follow-up, and also no patient developed infection (table 4),

The time off-work ranged from 16-19 day. The time to walk without pain ranged from 7 to 9 days (Table 5).

The histopathologies of all the sinus tracts were chronic inflammation. No evidence of TB



**FIGURE 4; - SEX DISTRIBUTION**



**FIGURE 5; - AGE DISTRIBUTION**

**TABLE1; - PILONIDAL CASES DISTRIBUTION**

Pilonidal cases distribution	numbers	percentage
primary	14	70%
recurrence	4	20%
post incision and drainage	2	10%

**TABLE 2; - CLINICAL PRESENTATION**

Complaint	Number	Percentage
(Mild/moderate) Pus discharge	18	90%
Pain	10	50%
Infection	4	20%
<b>Pilonidal abscess</b>	<b>2</b>	<b>10%</b>

**TABLE 3; - EARLY POST-OPERATIVE DATA**

	Range
Operative time	35-45 min
Hospital stay	4-5 days
Removal suture/healing period	12-15 days
Drain removal	7-9 days

**TABLE 4; - POST OPERATIVE COMPLICATION**

complications	NUMBER	PERCENTAGE
Seroma	2	10%
Infection	0	0
Necrosis at tip of the flap	1	5%
Gaping	1	5%
Recurrence	0	0

**TABLE 5; - TIME TO RESTORE NORMAL ACTIVITY**

	NUMBER OF DAYS
<b>Time off-work</b>	16-19 days
Time to walk without pain	8-10 days

**TABLE 6;- VISUAL ANALOGUE SCORE**

VAS SCORE	Mean ± SD
1	6 ± 1
3	5 ± 1
7	2 ± 1
1month	1 ± 0
3month	0



## DISCUSSION -

Pilonidal sinus was first described by Hodges. Pilonidal sinus is a chronic disease with intractable symptoms. Though, many surgical options like Excision and packing, Excision and primary closure, Marsupialisation, and Flap techniques are available, no technique fulfils all of the following criteria. Less financial cost, simple to perform, short hospital stay, minimal pain, rapid healing, short-term wound care and a low recurrence rate. As main source of the pilonidal sinus disease is Intergluteal-natal cleft and deep Intergluteal sulcus, the Limberg flap reconstruction techniques were developed which flattened the natal cleft, lateralized and fulfilled the wide local excised defect without tension whereas in primary excision it is impossible<sup>6</sup>.

Despite different procedure, no optimal treatment approach with nil recurrence has been achieved<sup>7</sup>.

So many wide range of procedure has been explained, starting from simple curettes to sophisticated flap. An ideal technique, in addition to clearing the disease should also prevent recurrence, by removal of natal cleft, removing anatomical inclination of sinus thus not leaving potential space for recurrence. However, none of the surgical strategies proven to be superior to others in every way. Pilonidal sinus most frequently seen after puberty in males, around 2<sup>nd</sup> and 3<sup>rd</sup> decade of life<sup>8</sup>.

Surgical management for this pilonidal sinus is by excising diseased tissue till sacrococcygeal fascia, but covering the defect is a matter of concern. For that one has to take into account infection and complication rates, patient's compliance, post-operative hospital stay, pain, and cosmetic outlook with preservation of bottom. Limberg reconstruction method has many advantages as the procedure is easy to design and perform, and short learning curve

and it flattens the cleft with large vascularized pedicle, and sutured without tension. This in turn maintains good hygiene, preventing maceration, reducing friction and avoiding midline scar which was main concern<sup>9</sup>.

The overall incidence in our studies is higher in males. The majority of patients seen are in second to third decade of life. All patients were given option of various surgical techniques for treatment of pilonidal sinus. Patient who agreed for Limberg flap were included.

Wound healing was faster and better in flap surgery. In our study no patient had any recurrence in 3 month follow up, few patients had tip flap necrosis and Seroma and minor infection which were treated with conservative management.

According to VAS till post 7 pain was negligible and treated with oral pain killer. And after 14 days 'pain score was nil. In most of our patients drain was removed before 10th day and reset to work within 3 weeks without discomfort.

## CONCLUSION; -

We want to conclude that wide local excision with Limberg flap reconstruction is a safe and reliable alternative to other surgical technique like wide local excision with healing by secondary intention, v-y plasty, Bascom procedure etc.

Limberg flap has easy learning curve with a very good and Promising results with significant low recurrence rate, short hospital stay, low VAS score, early return to work, shorter complete healing duration, with high patient satisfaction and cosmetically good result, so we want to conclude that simple and recurrent pilonidal sinus treated with Limberg flap is a safe and reliable technique with good promising results.

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