



OUTCOME OF MODIFIED LIMBERG FLAP RECONSTRUCTION IN THE MANAGEMENT OF UNCOMPLICATED SACROCOCCYGEAL PILONIDAL SINUS DISEASE

General Surgery

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ABSTRACT

Aim is to study the outcome of Modified Limberg flap reconstruction in the treatment of uncomplicated Sacrococcygeal Pilonidal sinus disease.

Objective is to determine the outcome of Modified Limberg flap surgery in the Pilonidal sinus disease with regards to Postoperative pain, Wound infection, Hospital stay and recurrence. **Conclusion** The Modified Limberg flap procedure is associated with lower incidence of midline maceration and wound recurrence rate when compared with reported results for conventional Limberg procedure.

KEYWORDS

Pilonidal sinus, Modified Limberg flap

INTRODUCTION:

Pilonidal sinus disease is an acquired condition seen usually in young and hirsute males. It was first described by Herbert Mayo in 1833, as a sinus containing hair follicles. Pilonidal disease is derived from Greek word 'pilus' meaning hair and 'nidus' meaning nest. It is characterized by chronic inflammation in one or more sinuses in the midline of the natal cleft which contains hair and debris. So, it is the sinus containing a free tuft of hairs. Pilonidal disease includes pilonidal sinus, cyst, and pilonidal abscess. It mostly affects Sacro-coccygeal area but can also affect the digital clefts, axilla and at the umbilicus.

Sacrococcygeal pilonidal sinus is a common condition and usually affects adult males under 45 years. The pathogenesis has always been controversy ranging from congenital to acquired theory. Nowadays trend has changed towards the acquired theory.

Patients usually presents with chronic infective discharge or acute attack of abscess. The main symptoms include localized pain, swelling and seropurulent discharge. Main problem after pilonidal sinus disease surgery is recurrence, and recurrence rates that range from 3 to 46% depending on the technique used are reported in literature. Due to the recurrent nature of the disease, it has got high morbidity. There are a number of operative and non-operative methods of treatment, no single procedure has been widely accepted as the gold standard treatment.

Sacrococcygeal region is the commonest area affected by pilonidal sinus, extra natal sites affected by Pilonidal sinus disease are finger webs in, perineum, suprapubic area, ear, amputation stump, axilla, chest wall and umbilicus. A dimple in the post anal region will have the same significance as at other sites like cheeks, chin, sacral region or knees.

Anatomically these denotes a local fixation of skin by dense collagenous fibres to underlying bone or fascia. Hence these dimple formation together with other factors will be important in the development of Pilonidal suppuration. The triad of post anal dimple, loose bits of hair and faecal residue is very important for the prophylaxis of individuals who are prone to Pilonidal suppuration. The dense collagen attaching the deep surface of the skin to the subjacent coccygeal and sacral periosteum is noted to prevent spread of the disease.

Clinical Presentation

Patients can present with acute, chronic, recurrent pilonidal disease or asymptomatic. In case of an acute pilonidal sinus abscess, the most important symptom is pain. Chronic or recurrent Pilonidal disease can present with discharging sinus, pain, itching which are intermittent. These sinus are predominantly located in midline natal cleft of Sacro-coccygeal region. commonly seen in persons having excessive hairs in that region and those who spends most of their life time in chair. occurs predominantly in males compared to females.

Waxing and waning phase: This is due to spontaneous drainage from the secondary sinus and when it gets reinfected leading to spontaneous rupture. Bacteroides and anaerobic cocci were most commonly reported in culture accounting for 77%, aerobic organisms in 4% and both were cultured in about 17%. Most commonly pilonidal sinus will track towards cephalic direction but rarely towards the anus, presenting as sepsis in the perianal region. In long standing pilonidal sinus, malignant transformation of sinus tract (squamous) have also been reported. These have a poor prognosis with high recurrence rate. Pain and foul smelling purulent discharge from the sinus opening were the most common presentation in about 70–80%. In India, the incidence of Pilonidal sinus disease is approximately 1.1%.

SEX: Pilonidal sinus disease affects twice in males compared to females. This male preponderance is due to their hirsute nature.

AGE: It mainly affects young adults of working age group. Pilonidal disease often affects men between the ages of 16-25 years.

Diagnosis: made by palpating the indurated region beneath the skin and epithelialized follicular opening in the sacrococcygeal region.

Prognosis: Pilonidal sinus disease carries an excellent prognosis with nil mortality unless squamous cell carcinoma develops, although abscess recurrence is common.

MANAGEMENT:

For the purpose of management, clinical presentation of the disease can be categorized into 3 types.

1. Acute pilonidal abscess
2. Chronic pilonidal sinus disease
3. Complex or recurrent pilonidal disease.

Various flap techniques have revolutionized the management of Pilonidal disease, because least recurrence, less morbidity and duration of hospital stay, good technique, cosmetically better with good patient satisfaction. It includes Rhomboid, V-Y advancement, Z-plasty and Myocutaneous flaps. Although the Limberg flap technique has become a popular surgical choice in the recent years, it is associated with some problems like incision site skin, maceration, and recurrence. Modified Limberg flap has been designed to eliminate midline maceration and recurrence.

METHODS:

This prospective study on Pilonidal sinus disease was conducted in the department of general surgery, Gandhi hospital from November 2020 to June 2022 after getting approval from ethical committee. The nature of disease, methodology of the study, type of surgery and the risks involved were clearly explained to the patient while getting informed consent. Pilonidal sinus were subjected to excision and Modified Limberg flap procedure done. All the information which

was collected from the patients and their case records were kept confidential.

Study Design:

Prospective observational study

Study Population:

12 patients of uncomplicated sacrococcygeal pilonidal sinus fulfilling the inclusion criteria from Gandhi hospital during the period of 2 years from November 2020 to June 2022 were included in this study.

Inclusion Criteria:

12 patients with age group between 20-60 years with uncomplicated sacrococcygeal pilonidal disease.

Exclusion Criteria:

Patients with Infections or abscesses in the pilonidal sinus.
Recurrent pilonidal disease
People with immunodeficiency disorders, diabetes mellitus, neurological disorders
Those who are under 20 and above 60 yrs age

Operative Technique:

The patients were hospitalized 1 day prior to surgery. The gluteal region was shaved and an enema for rectal cleansing was carried out 4-6 h before surgery. Patients were operated upon under spinal or general anaesthesia. Monocef (1 g) was given to all patients for prophylaxis before surgery. An adhesive tape was used to part the buttocks. Appropriate sterilization of the surgical area with povidone-iodine solution was done and parts draped under sterile aseptic precautions. The patients were placed in the jack-knife position.

Methylene blue (2-4 ml) was injected through the most prominent external opening of the sinus. All sinus tracts were resected en bloc with a rhomboid-shaped excision, using a surgical blade and electrocautery. The inferior apex of the excision was placed about 1-2 cm lateral to the midline. A Limberg flap, containing skin, subcutaneous tissue, and fascia of the gluteal muscle, was prepared with meticulous haemostasis and a vacuum drain was placed down to the presacral fascia.

The Limberg flap was sutured with deep and interrupted 2-0 vicryl sutures to the edges of the defect. The subcutaneous tissue was approximated with 4-0 interrupted sutures. The skin was closed with 3-0 polypropylene sutures. The lower pole of rotated flap was located approximately 2 cm lateral to intergluteal cleft. This procedure makes a tension free flap of unscarred skin away from midline.

Postoperative follow-up:

Patients were asked to return to the clinic on the 4th postoperative day. Drains were removed when the daily drainage decreased to less than 20 ml.

The skin sutures were removed on the 14th postoperative day. In case of secondary wound infection or hematoma, the wound was drained by removing few sutures with regular dressing and covered with appropriate broad spectrum antibiotics.

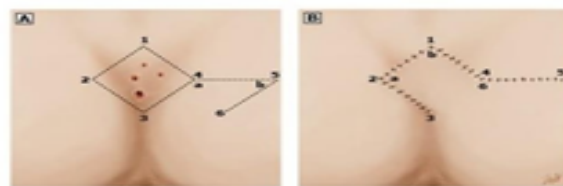
Operation time, early post op complications, post-operative pain score on day 1 and day 4, duration of hospital stay was recorded. In further follow up, day of suture removal and day of return to work or physical activity was also noted.

After 1 month, all these patients were reviewed for delayed complications regarding status of wound healing. Further long term follow up till 1 year was performed for recurrence of the disease and recorded.

A-Rhomboid incision marked B- Rhomboid excision and preparation of free flap.



Limberg flap



RESULTS

1. **Sex incidence:** In our study out of 12 patients 3(25%) are females and 9 (75%) are male patients

2. **Age Incidence:** 8 patients are between 21-30 years (66.67%), 3 are between 31-40 years(25%) 1 patient 41-60 (8.3%). MEAN $\pm$ SD :29.67 $\pm$ 6.68 years

Table – 1. Age Incidence Comparison

Age	Present Study	Surabhi P sai ⁽¹³⁾	Baki Eaci et al. ⁽¹⁵⁾
Mean $\pm$ SD	29.67 $\pm$ 6.68 yrs	29.48 $\pm$ 5.12 yrs	25.6 $\pm$ 6.3 yrs
Range	22- 35	20-39	18-38

3.Occupational preponderance:

Table – 2 Occupational Preponderance

OCCUPATION	No.of Patients	Percentage (%)
Driver	4	33.3
Shop keeper	1	8.3
Engineer	1	8.3
Students	2	16.6
Clerk	1	8.3
Agriculturist	1	8.3
Factory worker	1	8.3
Tailor	1	8.3
TOTAL	12	100

4. Clinical Presentation:

3 Patients presented with pain, 8 with discharge and 1 patient with swelling.

Table – 3 Clinical Presentation Comparison

Symptom	Present study	Surabhi P sai ⁽¹³⁾	Sondena et al. ⁽¹⁶⁾
Pain	3 (25%)	46 (92%)	35%
Intermittent discharge from sinus	8 (66.7%)	13 (26%)	66%
Swelling	1 (8.3%)	36 (72%)	50%

5. Duration Of Surgery:

Mean duration of surgery is 63.08 minutes and standard deviation of 3.34

Early Post Op Complications :

Table 4- Early Post Op Complications

EARLY POST OP COMPLICATIONS	MLF
NIL	6 (50%)
BLEEDING	1 (8.3%)
INFECTION	2 (16.6%)
HEMATOMA	1 (8.3%)
FLAP NECROSIS	1(8.3%)
DISCHARGE	1 (8.3%)
WOUND DEHISCENCE	0 (0%)

6. HOSPITAL STAY: Mean duration is 3.42 days and standard deviation of 0.640.

7. RETURN TO THE WORK OR PHYSICAL ACTIVITY: Mean duration of 13 days and standard deviation of 1.78.

8. ONE YEAR FOLLOW UP: Only one patient (of 12 total patients) presented with recurrence.(8.3%)

CONCLUSION

In our study of 12 patients of pilonidal sinus who presented with various presentations the following observations were made. Pilonidal disease is a disease predominantly affecting young male adults and with occupation involving prolonged sitting. The modes of presentation vary from asymptomatic to painful discharging sinus or swelling. Conservative management along with definitive surgical treatment forms the main aim of management of pilonidal disease. Wound complications as well as recurrence are still important

problems in patients operated upon for Pilonidal sinus disease. The Modified Limberg flap procedure is associated with lower incidence of midline maceration and wound recurrence rate when compared with reported results for conventional Limberg procedure. It is also associated with less hospital stay, early return to work and less postoperative wound complications. Hence it can be effectively used in the surgical management of Pilonidal sinus disease.

DISCUSSION

Pilonidal sinus disease is a benign condition affecting skin, subcutaneous tissues. Although it causes significant discomfort to the patients, they don't seek medical attention unless until complications arises. This disease is more prevalent in males due to overgrowth, distribution of hairs and their occupation. occurs mostly in the late teens and early twenties due to the hormone levels. But in females due to early onset of maturity, this disease occurs early. In our study, the mean age at presentation is 29 years. As the Pilonidal sinus is more common in patients who spent lot of time in sitting and working in close to vibration machinery. Our study also reflects the same. In our study, patients with Pilonidal sinus disease most commonly presents with intermittent discharge from sinus (66%) and pain (25%) in the gluteal region. 8 % of patients in our study were also admitted with swelling in the midline cleft which was often intermittent in nature. This disease if not adequately treated by definitive surgery will have high rates of recurrence. The mean duration of surgery was 63.08 minutes in the Rhomboid excision with Modified Limberg flap reconstruction. In our study, 50% had no early postoperative complications, serous discharge was seen in 8%, wound infection in 16%, hematoma in 8% and flap necrosis was noticed in 8% patients. In our study, the mean first postoperative pain score was 4.67. Similarly the mean postoperative pain score on fourth day was 0.83. Similar pain scores were also reported by Akca et al.⁽¹⁷⁾ In our study, 67% had moderate pain and 33% had mild pain on POD-1. 75% had no pain and 17% had mild pain and 3% had moderate pain on POD-4. In our study, the mean hospital stay was 3.42 days. In our study, the mean day of return to work was 14 days. In a study by Abdelraheem O et al⁽¹⁸⁾, the mean day of return to work was 18 days in Limberg flap group compared to 22 days in primary closure group. In our study wound healing is determined by the day of suture removal which was 14 days. In another study by A. Tavassoliet al⁽¹⁹⁾, it was 12.3 days in the flap group and 15.5 days in the primary repair group. In our study after 1 month of follow up, it was found that 67% of patients had healthy scar, 16.7% had wound gaping and 16.7% had hypertrophic scar. In our study after 1 year of follow up, it was found that 92% had no recurrence and 8% had recurrence. In another study by Abdelraheem O et al⁽¹⁸⁾, there was a 3.3% of recurrence in Limberg flap group compared to 20% in primary closure group (p- 0.035). In the study of Akca et al., recurrence rate was higher in the primary repair than the Limberg flap group.

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