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## Limberg flap versus primary closure in the treatment of sacrococcygeal pilonidal sinus

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### Abstract

Pilonidal sinus describes a spectrum of clinical presentations, ranging from asymptomatic hair-containing cysts and sinuses to large symptomatic abscesses of the sacrococcygeal region that have some tendency to recur. This study was undertaken in S.B.K.S.M.I.R.C., Piparia, Baroda to compare the results of rhomboid excision followed by Limberg flap with that of excision and primary closure in patients diagnosed with pilonidal sinus. A total of 100 patients with pilonidal disease were randomly divided into group A who underwent excision and primary closure (n=50) and group B who underwent the rhomboid transposition flap procedure (n=50). Length of hospital stay and postoperative complications in two groups were compared. Duration of hospital stay ( $P<0.001$ ) and time to resumption of work ( $P<0.001$ ) was less for group B, and postoperative complications were fewer in group B ( $P<0.05$ ). Therefore Limberg flap procedure is better than the simple excision and primary closure for the management of sacrococcygeal pilonidal disease.

**Keywords:** Pilonidal sinus, Limberg, rhomboid, primary closure

### Introduction

Pilonidal disease is described back as far as 1833, when Mayo described a hair-containing cyst located just below the coccyx. Hodge coined the term "pilonidal" from its Latin origins in 1880, and, today, pilonidal disease describes a spectrum of clinical presentations, ranging from asymptomatic hair-containing cysts and sinuses to large symptomatic abscesses of the sacrococcygeal region that have some tendency to recur. It commonly affects young and middle-aged male patients<sup>[1]</sup>. For more than hundred years, surgeons have been treating this disease by various treatment modalities, including simple incision and drainage, laying open, marsupialization, excision and primary closure, or rhomboid excision with Limberg flap procedure<sup>[2]</sup>. The aim of this study was to compare the Limberg flap procedure and the primary closure in the treatment of pilonidal sinus.

### Patients and Methods

The study was conducted between year July 2019- June 2020, whereby 100 patients with pilonidal sinus in the sacrococcygeal area were seen and included in the study. After obtaining written informed consent, patients were randomly (using table of random numbers) allocated to undergo either excision and primary closure (group A, n=60) or rhomboid excision and the Limberg flap procedure (group B, n=60). All patients were operated under spinal anesthesia. Methylene blue dye was used intraoperatively to stain the sinus so as to delineating the course and extensions of the sinus and thus achieving thorough debridement by excising all stained tissue to prevent recurrence.

In group A, a vertical elliptic incision was made that was deepened to reach up to the sacrococcygeal fascia and the lesion was excised. After achieving hemostasis, a suction drain was put in and wound was closed back primarily.

In group B, a rhomboid-shaped incision was made, with each side equal in length, around the mouth of the sinus. The incision was deepened and the lesion was excised (Fig 1). The rhomboid flap was then rotated from the gluteal fascia to the excised area without tension (Fig 2). Using interrupted sutures, the subcutaneous tissue and the skin were sutured.

Skin sutures were removed on the tenth postoperative day. Length of hospital stay, duration of inability to work, postoperative infection and wound dehiscence were recorded.

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Duration of inability to work was defined as the time from the date of surgery to the date on which the patient returned to normal activities, including employment.

The results were expressed as mean value  $\pm$  standard deviation. The chi-square test was applied for comparison between frequencies. All tests were two sided. The level of significance was set at  $P < 0.05$ .



**Fig 1:** A rhomboid shaped incision made around pilonidal sinus extending into gluteal area for limberg flap



**Fig 2:** Rhomboid Flap rotated and sutured to cover the excised lesion

## Results

Group A consisted of 41 male and 9 female patients with a mean age of 26 (16–40) years, and group B comprised 43 male and 7 female patients with a mean age of 24 (17–42) years. There were no significant differences between the two groups with respect to age and sex ( $P > 0.05$ ). The operating time was longer in group B. Morbidity developed in 13 patients in group A (infection in 7 patients; wound dehiscence in 6 patients) and in 4 patients in group B (infection in 3 patients and wound dehiscence in 1 patient) ( $P < 0.05$ ). The median duration of hospital stay was longer in group A ( $P < 0.001$ ). The median duration of inability to work was 20 days in group A and 9 days in group B ( $P < 0.001$ ).

	Group A	Group B	P value
Operation time (minutes)	60	80	$< 0.001^*$
Total hospital stay(days)	6	3	$< 0.001^*$
Wound Infection	7	3	$0.028^{**a}$
Wound Dehiscence	6	1	$0.042^{**b}$
Inability to work postoperatively (days)	20	9	$< 0.001^*$

\*Mann–Whitney U test

\*\*Chi-square test

Confidence interval: <sup>a</sup> 0.54–0.97, <sup>b</sup> 0.51–1.0, and <sup>c</sup> 0.57–1.0

## Discussion

The best operative technique for sacrococcygeal pilonidal disease is still controversial [3]. The treatment for sacrococcygeal

pilonidal disease aims to provide cure but with a low rate of complications and further to avoid prolonged hospitalization and ensure early return to work [4]. Muzi *et al.* studied 260 patients with sacrococcygeal pilonidal disease who were assigned randomly to undergo Limberg flap procedure or tension-free primary closure and concluded that there was no clear benefit for surgical management by Limberg flap over primary closure. Limberg flap showed less convalescence and wound infection, while the technique of tension-free primary closure was a day case procedure, less painful, and shorter than Limberg flap.

Although in the present study the operation time was longer in Limberg flap group, the hospital stay, inability to return to work and wound-related complications were significantly less compared to primary closure group. These findings were comparable with the study by Akca *et al.* [4]. Akin *et al.* studied the records of 411 patients with pilonidal sinus disease, who underwent rhomboid excision and Limberg flap, and concluded that the Limberg flap procedure is effective and has a low complication rate, short time for returning to normal activity, and short hospitalization [5]. Further studies have been undertaken whereby the classical Limberg procedure has been compared with the modified Limberg procedure. The modified procedure has shown better clinical results than in the classical procedure. The recurrence rate and the time to return to work have been statistically higher in the classical group. The maceration and wound infection rates have been statistically higher in the classical procedure than in the modified Limberg procedure [6]. As far as the complications are concerned, in the present study wound infection and dehiscence were observed in 14% and 8%, respectively, in the primary closure group and 2% and 0% in the Limberg flap group. Comparable findings were observed in the study by Mahdy [7]. Despite this broad range of surgical armament, the ideal treatment of pilonidal sinus disease remains a topic of debate and controversy [8–10].

## Conclusion

Rhomboid excision and Limberg flap closure is preferable to simple excision and primary closure in the treatment for sacrococcygeal pilonidal disease.

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