Original Research

Comparison of excision with primary repair versus Limberg flap

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ABSTRACT

Introduction: Pilonidal disease is a common chronic disorder, mostly affecting young adult males. Different hypotheses have been introduced for this disease, but acquired pathogenesis is the most acceptable one. Furthermore, different types of intervention are performed based on its pathogenesis. The aim of this study was to compare excision with primary repair versus the Limberg flap.

Materials and methods: One hundred patients, who were enrolled in this study were randomly divided into two groups of 50 patients. One group underwent excision with primary repair and the other group rhomboid excision with the Limberg flap. Then the demographic characteristics, early and late complications, comfort and pain score on the first and fourth postoperative day, hospital stay, time of return to work, and patient satisfaction were compared. \( P < 0.05 \) was considered statistically significant.

Results: The mean age was 24 years and the male to female ratio was 4:1. There was no significant difference between the two groups in terms of demographic characteristics, operation time, early complication rate and recurrence. But significant difference was observed in return to work, first pain-free toilet sitting, pain score and patient satisfaction.

Conclusion: It seems that the Limberg flap has similar complications as the primary repair method, but earlier return to work and less hospital stay, lower pain score and higher comfort and satisfaction were the advantages of the Limberg flap method. Thus, this method is recommended for the treatment of primary pilonidal disease.

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1. Introduction

Sacroccocygeal pilonidal disease is a common chronic condition usually affecting young adults under 45 years.1,2 Although it is a benign condition, it causes absence from work and school. The disease usually occurs in the intergluteal region, although it may occur elsewhere such as at the umbilicus and in the finger webbing in hair dressers.2 Regarding the pathophysiology of the disease, it has been commonly thought to be embryonic or acquired; however, nowadays it is commonly thought to be acquired.1,2 Karydakis invented a formula for this condition: Pilonidal disease = hair \( \times \) force \( \times \) vulnerability.2

The disease is epidemiologically seen in the Mediterranean and Gulf region.2 Clinical presentation ranges from the simple pit to the complex infectious type with multiple orifices and purulent or serosanguinous discharge.1

The most common site of involvement is the intergluteal (natal cleft or sacrococcygeal area). Clinical diagnosis is straightforward varying from acute pilonidal abscess, chronic pilonidal sinus, and complicated pilonidal sinus to recurrent pilonidal disease. According to the pathogenesis of the disease, different treatments have been introduced including non-operative management, excisional and incisional procedures and flaps.1-8 The aim of this study was to compare excision with primary repair versus the Limberg flap.

2. Materials and methods

This is an interventional cohort study that was performed on 100 patients with pilonidal disease who referred to Ghaem hospital, affiliated with the Mashhad University of Medical Sciences from 2005 to 2007.

Two types of operations including excision with primary repair and the Limberg flap were performed. Inclusion criteria were set between 15 and 45 years old and written consent of the patients for surgical treatment after being informed about the operative procedure and type. Exclusion criteria were:

1. Abscess formation.
2. Immunodeficiency and diabetes mellitus.
3. Patients younger than 15 and older than 45 years old.
4. Existing recurrent disease or previous surgery in the sacrococcygeal region.
5. Severe hirsutism in female patients.
6. Patients with psychiatric disease or poor hygiene.

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Then the patients were randomly divided into two groups of 50 patients. One group underwent simple excision with primary repair and the other group underwent rhomboid excision and the Limberg flap. Operation time, early complications such as infection, urinary retention, hematoma, and pain score in the first and fourth postoperative day were recorded for both groups. Complete recovery time and late complications, including delay healing, no healing, hypertrophic scar and keloid one month after surgery was recorded and long term follow-up after 6 months was performed. Patients were also asked concerning recurrence rate and patient satisfaction with the operation and scar formation. Then, the two groups were compared. Data were analyzed with the SPSS software (version 11) and chi-square and Fisher exact tests. \( P < 0.05 \) was statistically significant.

2.1. Surgical techniques

2.1.1. General considerations
All the patients were admitted the day before surgery. Operations were performed with general anesthesia and the intergluteal area was shaved with a clipper shave. The patients were placed in the prone position and the buttocks were separated with wide adhesive tapes. They received 1 g Cefazolin 30 min before the incision.

2.1.2. Excision and primary repair
The excision site was marked 1 cm away from the sinus. Then an elliptical incision was made that extended to the presacral fascia. The tissue was resected and hemostasis was completed applying electocautery. Tension was released by a limited sharp dissection above the fascia. Then the wound was closed in layers; deep tissue was closed with interrupted 2/0 Vycril string, superficial soft tissue was closed with 3/0 Vycril string and the skin was closed with 2/0 nylon string. Routine dressing was performed and removed the day after operation.

2.1.3. Limberg flap method
The excision and flap site were mapped (Fig. 1). The ratio of length to width was 60%. This rhomboid shape incision was made and continued to the presacral fascia and the tissue was excised. Then the fascio-cutaneous flap was divided from the underlying glutus muscle and rotated to the defect (Fig. 2). The wound was closed with 2/0 nylon string after hemo-vacuum drain placement. Routine dressing was performed and removed the day after operation (All strings were produced by SUPA, Islamic Republic of Iran.).

2.1.4. Postoperative care
The questionnaire was completed with the pain score ranking set at 0–10. Postoperative pain on the first day was scored and the patients were placed on a diet 8 h after surgery and prohibited from lying on their wound. If there was no discharge or discharge was less than 20 ml the drain was removed. Then they were discharged 8 h after surgery and prohibited from lying on their wound. If there was no discharge the day of pain-free sitting was assessed; it was 6.5 days in the flap group and 8.6 in the primary repair group (\( P = 0.08 \)). On the fourth postoperative day, the pain score was 1.9 ± 1.23 (0–6) in the flap group and 3.7 ± 1.23 (0–6) in the primary repair group (\( P = 0.02 \)).

The questionnaires were completed with the pain score ranking set at 0–10. The hypertrophic scar was evaluated 1 month after surgery. Five patients had a hypertrophic scar in the flap group compared to two patients in the primary repair group (\( P = 0.21 \)).

In the six months followed-up we found that recurrence occurred in one patient in the flap group and 4 patients in the primary repair group (\( P = 0.1 \)).

Patient satisfaction with the scar was also assessed six months after surgery using a standard questionnaire. As mentioned in Diagram 1 tree groups were identified according to degree of Moderate satisfaction.

Group 1: No satisfaction.
Group 2: Moderate satisfaction.
Group 3: Complete satisfaction.

### Table 1
The frequency of early complications and compares two groups

<table>
<thead>
<tr>
<th>Complications</th>
<th>Rhomboid flap N (%)</th>
<th>Primary repair N (%)</th>
<th>( P )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding</td>
<td>2 (4)</td>
<td>0 (0)</td>
<td>0.2</td>
</tr>
<tr>
<td>Urinary retention</td>
<td>4 (8)</td>
<td>3 (6)</td>
<td>0.5</td>
</tr>
<tr>
<td>Infection</td>
<td>1 (2)</td>
<td>3 (6)</td>
<td>0.3</td>
</tr>
<tr>
<td>Hematoma</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0.5</td>
</tr>
<tr>
<td>Discharge</td>
<td>5 (10)</td>
<td>1 (2)</td>
<td>0.1</td>
</tr>
</tbody>
</table>

![Fig. 1. Skin mapping for incisions.](image1.png)

![Fig. 2. Fascia-cutaneous flap was divided from the underlying glutus muscle and rotated to the defect.](image2.png)
As showed in diagram number of patients with moderate satisfaction were higher in Limberg flap (n = 30) but they were more patient with complete moderate satisfaction in primary repair group (n = 40).

4. Discussion

Pilonidal disease is a common disorder affecting young adults. It is a benign disease that causes morbidity and lost work days. Several methods have been invented in the management of the disease including medical treatment without surgical intervention, excisional methods and flaps. Each method has its own indications and advantages, depending on the condition of the patient and preference of the surgeon. Additionally, all types of treatments regard the pathogenesis of the disease. For example, according to the embryonic theory, wide excisions with primary repair were considered and for the theory of hair growth and entrapment in the natal, cleft flaps were designed. Generally an ideal operation for this condition is simplicity, lower hospital staying, lower complication rate, lower operation time, easier wound care, earlier return to work and cost-effectiveness.

In this study, early complications were evaluated including bleeding (drainage more than 20 cc), hematoma, urinary retention and wound infection (deep or superficial). Superficial wound infection occurred in 4 patients (8%) and in only 1 patient in the flap group (P = 0.3). There was no deep wound infection or wound dehiscence. Infection was managed with oral antibiotics and daily dressing. There are different reports on the rate of wound infection from 0 to 8% depending on several factors such as drain placement and BMI. Interestingly, there was no correlation between infection and type of operations. The same results were found in our study.

Author contribution
A. Tavassoli: study design, data collections, data analysis and writing.
S. Noorshafiee: study design and writing.
R. Nazarzadeh: data analysis and design data collections.

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Appendix. Supplementary data

Supplementary data associated with this article can be found in the online version, at doi:10.1016/j.ijsu.2011.02.009.

References

Conflict of interest
None declared.

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Ethical approval
None declared.


