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COMPARISON OF WIDE LOCAL EXCISION VERSUS LIMBERG FLAP IN PILONIDAL SINUS

General Surgery

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ABSTRACT

Introduction: Pilonidal disease consists of a hair-containing sinus occurring in the intergluteal cleft. Although the aetiology is unknown, it is speculated that the cleft creates a suction that draws hair into the midline pits when a patients sits. These ingrown hairs may then become infected and present with pus discharge from the sacrococcygeal region. Once an acute episode has resolved, recurrence is common. Furthermore, different types of intervention are performed based on its pathogenesis. The aim of this study was to compare wide local excision versus the Limberg flap. **Materials and Methods:** 50 patients with pilonidal sinus, 39 men and 11 women, with mean age of 24.2 years in males and 26.8 years in female's respectively they were divided into two Groups of A (wide local excision) and Group B (Limberg flap) for the removal of pilonidal sinus. Wound complications, patient's comfort, wound healing, recurrence rate and patient satisfaction were recorded for the two groups. The postoperative follow-up was 6 months. The collected data was analysed using chi-square test. P value <0.05 was considered insignificant. **Results:** In a total of 50 patients studied with mean age of 24.2 yrs in males and 26.8 years in females. Pain and bleeding was comparatively more in WLE group post operatively. But infection, recurrence rate and patient satisfaction were best in WLE group when compared to Limberg flap group after a period of 6 months. **Conclusion:** wide local excision patients had lower rates of infection and recurrence, more patient satisfaction and patients with acute infection also underwent WLE therefore more advantageous than Limberg flap. Thus this method is recommended for treatment of pilonidal disease.

KEYWORDS

WLE- Wide Local Excision, Pilonidal Sinus, Limberg Flap.

INTRODUCTION

Pilonidal means nest of hair and the term is derived from the Latin words for hair (pilus) and nest (nidus).This condition was first described by Herbert Mayo in 1833. Term pilonidal sinus was coined by Hodges in 1880 [2]. Pilonidal sinus describes a condition found in the natal cleft overlying the coccyx, consisting of one or more, usually non-infected, midline openings, which communicate with a fibrous track lined by granulation tissue and containing hair lying loosely within the lumen. A common affliction amongst the military, it has been referred to as 'jeep disease'[1].

The pathogenesis of the disease may be congenital or acquired, exact mechanisms of development are speculative. Evidence that supports the theory of the origin of pilonidal sinuses as acquired, the age incidence of the appearance of pilonidal sinus (82% occur between the ages of 20 and 29 years) is at variance with the age of onset of congenital lesions. The disease mostly affects young men, in particular hairy men and is characteristically seen in dark-haired individuals rather than those with softer blond hair (Oldham) [1]. The estimated incidence rate is 26 per 100,000 people [2]

Pilonidal disease = hair x force x vulnerability [3]. 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 [1,3].

Pilonidal sinus is associated with obesity (37%) as in obese patients intergluteal sulcus is wet and fragile, and this process is more pronounced [2], pilonidal sinus is also associated sedentary occupation (44%) and local irritation or trauma (34%) [4]

Patients complain of intermittent pain, swelling and discharge. It is thought that the combination of buttock friction and shearing forces in that area allows shed hair or broken hairs which have collected there to drill through the midline skin, or that infection in relation to a hair follicle allows hair to enter the skin by the suction created by movement of the buttocks, so creating a subcutaneous, chronically infected, midline track (primary sinus) secondary tracts run laterally from midline tract. Sinus tract runs cephalad [1].

According to the pathogenesis of the disease, different treatments have been introduced including non-operative management, excisional and incisional procedures and flaps.

Due to the recurrent nature of the disease and its high morbidity, many surgical procedures have been described for treatment of both primary and recurrent pilonidal disease. Surgical treatment of pilonidal disease has long been controversial and several procedures have been used. The acute disease with abscess development demands incisional drainage and excision, but chronic disease is usually treated with wide excision or flap closure.[5,6]

Objectives

Comparison between wide local excision and the Limberg flap.

METHODS AND MATERIALS

This is a retrospective observational study that was performed on 50 patients with pilonidal disease, 39 men and 11 women, with a mean age of 24.2 yrs in males and 26.8 years in female's respectively, admitted in Department of General Surgery in Vydehi institute of medical sciences and research center, Bangalore, from June 2018 to August 2019. Two types of operations including wide local excision and the Limberg flap were performed.

Inclusion Criteria were:

- Age between 15 and 40 years old
- Patient consenting for surgical treatment after being informed about the operative procedure and type.
- Patients with pilonidal abscess

Exclusion Criteria were:

- Immunodeficiency and diabetes mellitus.
- Patients younger than 15 and older than 40 years old.
- Existing recurrent disease or previous surgery in the sacrococcygeal region.
- Patients with psychiatric disease or poor hygiene.

Then the patients were randomly divided into two groups. Group A underwent wide local excision (N=27) and the other Group B underwent Limberg flap (N=23). Complications, pain (visual acuity score), bleeding, infections, wound healing (no of days in hospital), recurrence rates and patient satisfaction was compared in both groups. Data was analysed with the SPSS software (version 11) and chi-square test.

Surgical Techniques:

General Considerations: All the patients were admitted in general surgery department. Operations were performed with spinal anaesthesia and parts prepared from back to mid-thigh along with gluteal region. The patients were placed in the prone position and the buttocks were separated with wide adhesive tapes. They received Tetanus 0.5cc IM and Ceftriaxone 1 gm 30 min before the incision. To reveal the pilonidal sinus cavity, each patient was injected 2-3mL of methylene blue through the sinus using a 5 mL needle to avoid any missing of side tracks.

Wide local excision: 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 haemostasis was completed applying electrocautery. Tension was released by limited sharp dissection above the fascia. Wound was left to granulate and heal by secondary intention.

Figure1: Wide Local Excision.

Limberg Flap Method:. A rhomboid incision (with each side equal in length), including the sinus, was made down to the presacral fascia around the mouth of the sinus A rhombic area of skin and subcutaneous fat was excised, which included both the midline pits and any lateral sinus extensions. First the line A–C was drawn and its length was measured. Point C would be adjacent to the perianal skin and point A was placed so that all diseased tissue was included in the extension. The line B–D transacted the midpoint of A–C at right angle and 60% of its length. In this rhomboid-shaped incision angle at A and C was 60° and incisions at B and D were 120°. The flap was planned so that D–E was direct continuation of the line B–D and was of equal length to the incision B–A to which it would be sutured after rotation. E–F was parallel to D–C and was of equal length. The wound was closed with deep tissue with interrupted 2-0 Vycril R/B , and the skin was closed with 2-0 Ethilon R/C/ Monocryl 3-0 R/C and vacuum-suction drain 14F was placed and secured with Mersilk 1-0 R/C. Routine dressing was performed and removed the day after operation.

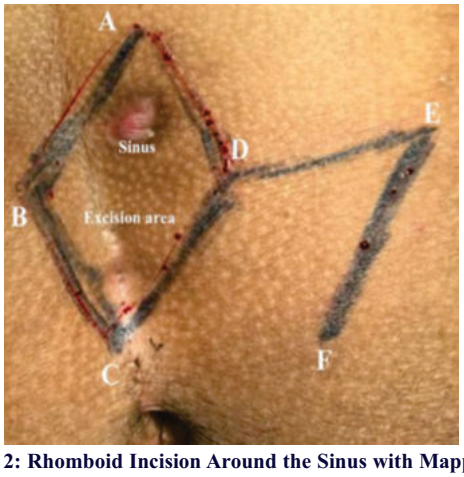

Figure 2: Rhomboid Incision Around the Sinus with Mapping of the Flap.

Figure 3 : Raw Area After Excision

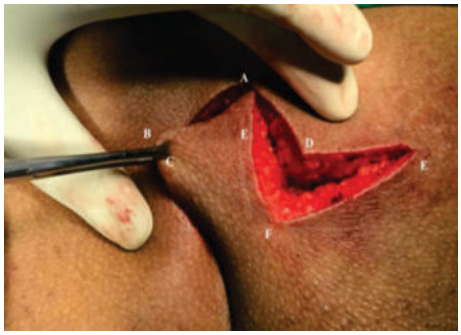

Figure 4: Rotation Of The Rhomboid Flap to the Raw Area After Excision.

Figure 4: After Completion of Procedure

Postoperative Care:
Postoperatively patients were placed on a liquid diet followed by soft diet 6 h after surgery and prohibited from lying on their wound. Post op day 1 patients were started on oral antibiotics and analgesics, If there was no discharge or discharge was less than 20 ml the drain was removed. Regular dressing were done.

RESULTS
Study was conducted on 50 patients who were admitted I our hospital, in which 39 were males and 11 females the mean age was 24.2 and 26.8. The most common were sinus tract and mild discharge, most of them had sedentary work like drivers and software engineers. 27 patients underwent excision and 23 patients underwent Limberg flap procedure as described in Table 1.

Table 1: Distribution of Cases According into Groups

Gender	Group		T (n=50)	Age mean (years)	P
	WLE	LIMBERG			
Males	21	18	39	24,2	
Females	6	5	11	26.8	
	27	23	50		

Pain was calculated with visual acuity score on 1, 7, 14th day. Patients who underwent experienced maximum pain lasting longer compared to patients who underwent Limberg flap (p=) as discussed in Table 2.

Table 2: Comparison of Pain Duration

	Group A(WLE)	Group B (LF)	P
Pain	10-12 days	3-4 days	

Bleeding was assessed with the soakage of dressing, which was comparatively more in group A (WLE) 5-6 days where as it was 2-3 days in group B (LF) (p value).

Table 3: Comparison Table

Complications	Group A (WLE)	Group B (LF)	P value
Bleeding	5-6 days	2-3 days	
Infection	3 patients	6 patients	
Flap necrosis	0 patients	4 patients	
Healing time	24-26 days	10-12 days	
Recurrence	2 patients	6 patients	

Infection and flap necrosis was more in flap group while compared to group A (WLE). Group B (LF) had 6 and 4 patients respectively. Whereas group A (WLE) has only 3 and 0 patients.

In the six months followed-up we found that recurrence occurred only in 2 patient in the group A (WLE) and 6 patients in group B (LF) (p value). In a study done by Solla and Rothenberger, the mean healing

time for 150 patients who underwent this excision was shown to be four weeks with a recurrence rate of 6% [11] which is comparatively similar to our study.

Patient satisfaction with the scar was also assessed 6 months after surgery using a standard questionnaire. As mentioned in three groups were identified according to degree

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

Patients with moderate satisfaction in Limberg flap 7 and complete satisfaction in 10 but they were more patient with complete satisfaction in wide local excision group 14, and moderate satisfaction in 10 patients Table 3.

Table 3: Comparison of Patient Satisfaction

Patient satisfaction	Group A (WLE)	Group (LIMBERG)	P
No satisfaction	4	6	
Moderate satisfaction	11	7	
Complete satisfaction	14	10	

DISCUSSION

Pilonidal disease is a common disorder affecting young adults, mostly males with sedentary work. Several methods have been put forward for the management of the disease including medical and surgical intervention. Each method has its own indication and advantages depending on the condition of the patient and preference of the surgeon. Ideal procedure, in addition to eradicating the disease, should also eliminate the natal cleft which is anatomical predisposition for the recurrence of the sinus[10]. Types of treatment regards the pathogenesis of the disease for example according to embryonic theory wide local excision were considered and for theory of hair growth and entrapment flaps were designed [7]. There is no proof that one modality is better than other.

Consequently, comparing clinical outcomes after wide local excision versus Limberg flap seems to be of special interest. There was a prominent male predominance in our study. Out of the total 50 patients 78% were male and 22% female, as expected healing is slower in open wounds, however small, as compared to closed wounds. 24-26 days as compared to 10-12 days. Pain and bleeding was also comparatively more in WLE group, Wound Infection was graded as per Southampton wound grading system.[8] It is as follows:

Grade

0 Normal Healing
I Normal Healing with mild bruising and erythema
II Erythema plus other signs of inflammation
III Clear or haemo serous discharge
IV Major complication, Pus or deep/ severe wound infection with or without tissue breakdown, haematoma requiring aspiration.

In our study, 6% in excision and 12% in Limberg Flap procedure exhibited wound infections. Again similar results were obtained by, McCallum IJ et al. conducted a systemic review and meta-analysis on all studies on pilonidal sinus, in which only Five trials (559 participants) assessed the rate of surgical site infection after open healing compared with primary closure (all techniques) and although infection rates were somewhat higher after open healing but it did not expose any statistical significance[9]

Flap necrosis was reported in 4 cases of Limberg flap method. Flap necrosis can occur due to either ischemia/pressure necrosis or tension at the suture line. All patients were advised to lie in prone position for 48 h after surgery to prevent ischemia and pressure necrosis.

Nevertheless, the most important aspect to take into in consideration is whether recurrence occurs as it's of utmost importance for the patient, our study showed less recurrence in WLE 2 when compared to Limberg flap 6.

Patient who underwent WLE showed more complete satisfaction at the end 6 months.

Limitations

It is a comparison between only two modalities of treatment, cost effectiveness of the study was not compared, higher rate of male involvement, but it's the nature of the disease, study was conducted only on 50 patients and further studies have to be considered for larger population.

CONCLUSION

Wide local excision is an easier method that could be done by any surgeon. In pilonidal disease recurrence is the most feared complication between surgeons and patients. As its occurrence has emotional and socio-economic effects, the study concludes that even though pain and bleeding was more in patients who underwent excision, recurrence and patient satisfaction was best in excision group. Hence wide local excision should be considered as preferred treatment for pilonidal disease.

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