

Comparison between Limberg's Flap and Wide Excision in the Treatment of Sacrococcygeal Pilonidal Disease

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Abstract: ***Objective:** A Comparative study of management strategy for sacrococcygeal pilonidal disease-Wide excision & Secondary healing vs Limberg's Flap surgery. **Design:** Prospective observational clinical study of 30 cases. **Setting:** Hindustan Aeronautics Ltd Hospital, Bangalore, Karnataka. **Material & method:** Study design - Randomized prospective open labeled comparative study. **Sample population** – The OPD/IPD patients who shall be treated for pilonidal disease (sinus, cyst or abscess) in Hindustan Aeronautics Limited Hospital, Bangalore from April 2012 to June 2014. **Patients** will be randomly be assigned to group 1 or group2. **Group1-** will undergo wide excision for pilonidal disease. **Group 2-** will undergo Limberg's flap surgery. **Patients** will be followed up till June 2014. **Patient** will also be followed up for recurrence, duration of hospital stay, duration of incapacity to work, time required for complete healing, post operative complications. **Results:** Incidence of Seroma in the with wide excision and secondary healing in the present study also was 0%. It was significantly more associated with wide excision and secondary healing ($P=0.024$). We observed that Mean number of hospital stay is significantly shorter in patients who underwent Limberg flap surgery 5.27 ± 1.14 days as compared to those Wide Excision with secondary healing 7.67 ± 1.29 days with $P<0.001$. In the present study Mean number of dressings in Limbergs Flap were found to be 5.90 ± 4.75 whereas with Wide excision and secondary healing it was observed to be 15.73 ± 3.07 . Hence Mean number of dressings in Limbergs Flap are significantly less than with Wide excision and secondary healing ($P<0.001^{**}$). **Conclusions:** Incidence of post operative complications after limbergs flap surgery are similar to those after wide excision. Number of days in hospital, number of days of loss of work and time taken for complete healing is significantly reduced in limbergs flap surgery. Limbergs flap surgery is more cost effective treatment option when compared with wide excision with secondary healing. Incidence of recurrence is statistically similar in two groups. Hence limbergs flap surgery is better surgical treatment in pilonidal sinus disease.*

Keywords: Pilonidal Disease, Limberg's Flap, Wide Excision, Secondary Healing, Surgery

1. Introduction

Pilonidal disease includes pilonidal sinus, pilonidal abscess and pilonidal cyst. It is characterized by multiple subcutaneous sinuses or abscesses containing hair. Pilonidal disease consists of a spectrum of entities ranging from asymptomatic hair containing cysts and sinuses to a large abscess. It is a painful condition in acute phase and has long period of chronic phase characterized by discharging sinus which subsides only to recur. It has high morbidity and high rate of recurrence after treatment. It causes considerable absence from work, social embarrassment and it also has a profound psychological impact. It is mainly seen in 20 to 40 year old hairy men. Its incidence is calculated to be around 26 per 1,00,000.^{1,2,3} Can a pilonidal sinus affect the psychological wellbeing of patients? Well yes it can!⁴ Is pilonidal sinus a life threatening disease? Malignant change is a relatively rare complication of pilonidal disease, but evidence of at least 50 such cases is available in published medical literature.⁵ Surgical options for treatment of chronic pilonidal disease are many like wide excision without primary closure, excision and primary midline closure, Bascom's, Kardaykis and rhomboid excision with Limberg flap etc. Despite advancement in plastic surgery and better understanding of its pathogenesis, the ideal surgery for pilonidal sinus remains unknown. In Indian scenario, ideal treatment method should not only have low recurrence rate but it should also be cost effective. Very few studies till date have made an attempt to evaluate cost to the patient. This is a parameter which is important to investigate in future studies.

2. Aims & Objectives

- 1) A Comparative study of management strategy for sacrococcygeal pilonidal disease-Wide excision & Secondary healing vs Limberg's Flap surgery.
- 2) To evaluate the technique of Limberg's flap in the management of sacrococcygeal pilonidal disease surgery as compared to wide excision with respect to morbidity, recurrence rate, cost, time to return to work.

Material & Method

Study design - Randomized prospective open labeled comparative study

Target Population – Employees of HAL Ltd and their dependants.

Sample population – The OPD/IPD patients who shall be treated for pilonidal disease (sinus, cyst or abscess) in Hindustan Aeronautics Limited Hospital, Bangalore from April 2012 to June 2014.

Inclusion Criteria

- Patients age more than 14 yrs
- Both males and females having symptom of pilonidal sinus are included

Exclusion Criteria

- Osteomyelitis
- Fistula in ano or perianal abscess
- Dermoid or sebaceous cyst
- Hydradenitis

Patients will be randomly be assigned to group 1 or group2.

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Group 1- will undergo wide excision for pilonidal disease.
 Group 2- will undergo Limberg's flap surgery.

Patients will be followed up till June 2014. Patient will also be followed up for recurrence, duration of hospital stay, duration of incapacity to work, time required for complete healing, post operative complications. Cost will depend on total number of dressings required in post op period, type of surgery & duration of incapacity to work.

- Duration of incapacity to work was defined as number of days taken to resume duty.
- Complete healing was defined as complete epithelialisation
- Recurrence was defined as formation of pilonidal sinus after complete epithelialisation.
- Postoperative infection was defined as the development of cellulitis and/or purulent discharge from the wound edges or drains.
- The postoperative time off work- the patients were asked when they felt comfortable and convenient to join work.

Calculation of sample size: *The total sample size for the study is as follows:*

$$N = \frac{(r+1)(Z_{\alpha/2} + Z_{1-\beta})^2 \sigma^2}{r d^2}$$

Where Z_{α} is the normal deviate at α level of significance (Z_{α} is 1.96 for 5% level of significance and 2.58 for 1% level of significance) and $Z_{1-\beta}$ is the normal deviate at $1-\beta$ power with β of type II error (0.84 at 80% power and 1.28 at 90% statistical power). $r=n1/n2$ is the ratio of sample size required for two groups, generally it is one for keeping equal sample size for two groups.

Randomization

Randomization for assignment of patients to two groups has been done using online software www.randomization.com.

3. Results

Clinical variable	Limbergs Flap	Wide excision with secondary healing	P value
Age in years			
<20	2(6.7%)	1(3.3%)	P=0.503
20-30	21(70%)	19(63.3%)	
31-40	7(23.3%)	10(33.3%)	
Seroma			
No	24(80%)	30(100%)	P=0.024*
Yes	6(20%)	0(0%)	
Infection			
No	28(93.3%)	23(76.7%)	P=0.145
Yes	2(6.7%)	7(23.3%)	
Post op complication			
No	22(73.3%)	23(76.7%)	p=1.000
Yes	8(26.7%)	7(23.3%)	
No. of days in Hospital			
1-3	1(3.3%)	0(0%)	P<0.001**
4-5	17(56.7%)	3(10%)	
6-8	12(40%)	18(60%)	
9-10	0(0%)	9(30%)	
>10	0(0%)	0(0%)	
Number of Dressings			
1-5	2(6.7%)	0(0%)	P<0.001**
6-10	5(16.7%)	1(3.3%)	
11-15	1(3.3%)	14(46.7%)	
16-20	1(3.3%)	13(43.3%)	
21-25	1(3.3%)	2(6.7%)	
Duration of incapacity to work			
1-5	0(0%)	0(0%)	P<0.001**
6-10	28(93.3%)	1(3.3%)	
11-15	0(0%)	6(20%)	
16-20	0(0%)	13(43.3%)	
21-25	1(3.3%)	7(23.3%)	
26-30	1(3.3%)	1(3.3%)	
>30	0(0%)	2(6.7%)	
Complete healing			
1-5	0(0%)	0(0%)	P<0.001**
6-10	13(43.3%)	0(0%)	
11-15	14(46.7%)	1(3.3%)	
16-20	1(3.3%)	6(20%)	
21-25	0(0%)	6(20%)	
26-30	0(0%)	7(23.3%)	
31-35	0(0%)	5(16.7%)	
36-40	2(6.7%)	4(13.3%)	
>40	0(0%)	1(3.3%)	

4. Discussion

One recognized problem associated with flap construction is early development of seroma and haematoma formation. This problem is usually not encountered with wide excision with secondary healing. This reflects in the low incidence of seroma reported by Jamal A⁷ and Aman Z⁶ as 2% and 0%. Incidence of Seroma in the with wide excision and secondary healing in the present study also was 0%. It was significantly more associated with wide excision and secondary healing (P=0.024). In the present study, Limbergs Flap had an incidence of seroma of 20%. This is higher than found in literature.

In the study by Jamal A, incidence of infection was 8% with Limberg flap whereas in those patients who underwent open excision it was increased to 28%. In the present study incidence of infection was 6.7% with Limbergs flap and 23.3% with wide excision with secondary healing. This is statistically not significant but more associated with Wide excision with secondary healing with P=0.145.

We observed that Mean number of hospital stay is significantly shorter in patients who underwent Limberg flap surgery 5.27±1.14 days as compared to those Wide Excision with secondary healing 7.67±1.29 days with P<0.001.

Patients with wide excision had to stay away from resuming their work for a longer period as the wound takes more time to heal by secondary intention. From this observation, one can infer that due to shorter hospital stay and early wound healing, a patient will have a shorter period of incapacitation.⁵⁸ In the present study Mean duration of Incapacity to work is significantly less in Limbergs Flap 8.40±4.81 days with Wide excision with secondary healing 19.40±5.85 days P<0.001.

In the present study Mean number of dressings in Limbergs Flap were found to be 5.90±4.75 whereas with Wide excision and secondary healing it was observed to be 15.73±3.07. Hence Mean number of dressings in Limbergs Flap are significantly less than with Wide excision and secondary healing (P<0.001**). In the study done by Elshazly W⁹ mean duration of complete healing after Limbergs flap was 19.1±3.7 days. In the present study it was 13.20±7.09 days. In the present study mean duration of complete healing is significantly less in Limbergs Flap with P<0.001. In the present study incidence of recurrence is statistically similar in two groups with P=1.000. Incidence of recurrence with Limbergs flap in the present study was 3.3% which is in accordance with the finding of Altintoprak^F(3.9) and Akin M(2.91).

Hameed⁸ in his study compared open healing with midline closure and found the later to be significantly cheaper (MD 23.94 Rupees, 95% CI 0.73 to 47.15). The cost of treatment by open healing was £46.21 and by closed technique £30.43 in the year 2001. However, post operative care is costlier in wide excision with secondary healing due to the need for more number of dressings. In the present study average cost of Limbergs flap was Rs. 5920± 1283 and that with wide excision with secondary healing was Rs. 7205± 1413. In the

present study cost to the patient was significantly less with Limbergs Flap surgery with P<0.001.

5. Conclusions

- 1) Pilonidal sinus is more common in males
- 2) Incidence of post operative complications after limbergs flap surgery are similar to those after wide excision.
- 3) Number of days in hospital, number of days of loss of work and time taken for complete healing is significantly reduced in limbergs flap surgery
- 4) Limbergs flap surgery is more cost effective treatment option when compared with wide excision with secondary healing
- 5) Incidence of recurrence is statistically similar in two groups.
- 6) Hence limbergs flap surgery is better surgical treatment in pilonidal sinus disease.

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