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Original Research Article

A Comparative Study Between Limberg Flap and Z-Plastyin the Management of Sacrococcygeal Pilonidal Sinus at A Tertiary Care Centre of Western Rajasthan

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Conflict of interest: Nil

Abstract

Introduction: Pilonidal sinus disease (PSD), most commonly seen in young men, is a chronic disease arising from the pilosebaceous in the sacrococcygeal region. There is still no standardization in surgery therapy. Efficacy, follow-up results and quality of life levels were compared in this study between the Limberg flap (LF) and the Z-Plasty procedure.

Material and method: This comparative study was performed on 46 symptomatic or recurrent cases of pilonidal sinuses admitted to the surgical departments of DR.S.N. Medical College, Jodhpur from June 2022 to December 2022.

Result: The mean age of sacrococcygeal pilonidal sinus presentation was 29 years with a male predominance manifested by pain and seropurulent discharge as the most common complaints. Parameters regarding duration of surgery, average length of hospitalization, postoperative complications and postoperative period natal cleft depth corrections were comparable between the 2 groups, the difference is statistically significant.

Conclusion: In conclusion, we can say that rhomboid excision and Limberg flap closure, with a shorter operating time, less length of stay in the hospital, low rate of postoperative complications, shorter time required for a complete wound healing and greater correction of the postoperative depth of the natal cleft is more suitable in treatment of pilonidal sinus disease than Z-Plasty.

Keywords: Pilonidal Sinus, Sacro-coccygeal, Z-Plasty, Limberg Flap, Natal Cleft, Hair Density.

Introduction

Pilonidal sinus was first described in 1880 by Richard Hodges [1]. Pilonidal sinus is a chronic inflammation process of the skin and subcutaneous tissue of the sacrococcygeal region. Occurrence of pilonidal sinus in the world population is 0.7%[2]. The most common site of a pilonidal sinus is the sacrococcygeal. A pilonidal sinus is usually diagnosed in a young man, in pilonidal sinus aetiology as

obesity, prolonged sitting, deep natal cleft, local trauma, excessive hair growth and poor hygiene and a positive family history predispose to development this benign disease.

Patients complain of occasional pain, swelling and discharge in the lower part of the spine. The diagnosis of pilonidal disease is mostly clinical. There are different treatments in the management line available as conservative, pus drainage, sinus excision, limberg flap, z-plasty, karydakis flap and v-y flap technique.

A comparative study of the Limberg flap and the Z-Plasty in management of sacrococcygeal pilonidal sinus in terms of pilonidal sinus recurrence, duration of wound healing, time length of operation, time to return to normal activity, correction of the depth of the natal canal, total duration of hospital stay and complications.

Materials and methods

This comparative study was performed on 46 admitted cases of symptomatic or recurrent pilonidal sinuses to the surgical department of DR.S.N. Medical College, Jodhpur from June 2022 to December 2022.

Inclusion criteria:

Patients from the age groups of 18 to 70 years and both sexes, patients with symptomatic pilonidal sinuses (new or recurrent), having either pain, abscess formation, cavities and discharge.

Exclusion criteria:

1. Newly diagnosed diabetes mellitus (based on HbA1C).

2. Patients with bone tumour/osteomyelitis of the Sacro-coccygeal region (X-ray, CT basis).

Based on the indication for surgery, all patients will be divided into two groups of 23 patients each (46 in total). Group A- the first 23 cases undergo a Limberg flap, which is considered a case group. Group B- another 23 cases will undergo Z-Plasty will be considered as the control group.

All patients will be asked about demographics (age, gender, height, weight), any significant medical history taking into account predisposing factors such as occupation, lifestyle, family history and thorough general physical condition an examination will be carried out. A detailed examination of the sinuses will be performed to determine their location, extent, infection and any discharge. Further examinations such as sinogram, MRI will be performed in complex cases and if necessary.

After a complete examination, pre-anaesthetic evaluation, patients will be scheduled for the planned surgery. Preoperative fasting will be performed according to the protocol, bowel preparation and a single dose of antibiotic will be administered intravenously to the patient. 23 cases undergo a wide excision of the sinus tract with primary closure of Limber flap. Patients undergoing this procedure will be managed as a case group.

In this procedure, according to the anaesthesiologist and the patient's compliance, general anaesthesia or spinal anaesthesia will be given to the patient. The patient will be held prone in the jack-knife position with a pillow underneath belly to lift hips. The buttocks will be held apart by taping to expose the operative area and the relative procedures will be performed. Chi square test is used to compare Limberg and Z-Plasty. Statistical the analysis of the result is done using SPSS. $P< 0.05$ is considered significant.

A rhombus was marked around the lesion with a marker pen and one of the angles was extended a fell like a conventional Limberg flap. The lesions and all sinus tracts were completely excised all cases. The fascio-cutaneous flap was elevated

and rotated. Skin closure was achieved after haemostasis with Suture ETHILON 3-0. For Z-Plasty, the vertical ellipse was initially marked with a marker pen with the sinus tract as its centre and thus forming the vertical division of Z-Plasty. There were two horizontal limbs drawn depending on the length of the vertical limb. The lesion with all sinus tracts was excised into a after raising the flaps, Z-Plasty was supplemented with covering the defect. The skin was closed using ETHILON 3-0 stitches. In both methods, a suction drain was placed and removed when the outflow was <10 ml in 24 hours.

Figure 1: Pre-operative depthpre operative depth of natal cleft (2.5cm)

Figure 2: Post operative depth of natal cleft (0 cm)of natal cleft

Result

This study showed that the most common age of presentation in the age group of 18-29 years. The occurrence of pilonidal disease is more common in men. Maximum no. of patients belong to Agriculture 32.60% (15 patients). 47.83% (22 patients) patients have more than 30 BMI (obese), 54.34% (25 patients) with a complaint of pain, 26.08% (12 patients) with discharge and 08.70% (4 patients) with a complaint of swelling. 73.91% (34 patients) of patients had a deep natal cleft. 21.73% (10 patients) patients had accompanying sinus discharge. 10.86% (5 patients) of patients had swelling with pilonidal sinus. Scanty hair density was found in 23.91% of patients, while Course hair density was found in 76.09% of patients. The incidence of the disease was more frequent in patients with deep natal cleft (73.92%), while superficial natal cleft was found in 26.08% of patients. 95.65% were patients with primary pilonidal disease in a recurrent state the disease was observed in 04.35%. Among patients with scanty hair density, 13.04% had a surface density of natal clefts and 10.86% had a deep natal cleft. Among patients with superficial natal clefts 13.04% had course hair density, while in patients with a deep cleft, 63.04% had course hair density.

All women had primary disease. Recurrent disease (04.35%) was present only in male patients. In the primaries disease, scanty hair density was found to be 23.91%, while course hair density was found to be 71.73%. In recurrent disease, course hair density was found to be 04.34%. In primary disease, shallow natal cleft was found 26.08%, while deep natal cleft was 69.56%. In recurrent disease, a deep natal cleft was found in 04.34% of patients.

The pilonidal sinus is occur in patients with high risk factors such as obesity, male gender, patients with deep natal clefts and pubic hair distribution patients. Duration of operation in Limberg Flap (average 38.04±4.45 minutes) shorter than Z-Plasty (44.78±2.81 minutes). The length of hospitalization during the Limberg Flap procedure (06.26±1.05 days) is shorter than the Z-Plasty procedure (07.00±1.16 days). The time required for complete

wound healing is shorter with the Limberg flap (mean 11.43±0.99 days) than Z-Plasty (mean 13.95±4.16 days).

Post operative wound infection in Limberg flap is 04.34% (1 patient) of patients and 08.69% (2 patients) of patients in the Z-Plasty procedure. Only 04.34% (1 patient) patient with postoperative collection after Z-Plasty and no any postoperative collection seen with the Limberg Flap procedure. Postoperative complications (wound infection, pus or seroma) after the Z-Plasty procedure is observed in 08.69% (2 patients) of patients and 04.34% (1patient) patient after Limberg Flap. Post operative correction in depth of natal cleft is more in patients undergoing Limberg flap procedure(98.26%) than Z-Plasty (86.52%).

Table1: Comparison of post-operative correction in depth of natal cleft in patients between limberg flap and Z plasty procedure

Procedure	Preoperative depth of natal cleft(cm)	Post-operative depth of natal cleft(cm)	Post-operative depth correction (cm)	Percentage of correction
Limberg flap	2.31	0.04	2.27	98.26%
Z-Plasty	2.30	0.31	1.99	86.52%

Table2: Comparing different parameters between Limberg and Z-plasty

Parameter	Limberg Flap	Z-Plasty	P value
Time duration of surgery	38.04±4.45 minute	44.78±2.81 minute	0.0001(S)
Time taken for completeHealing of wound	11.43±0.99 days	13.95±4.16 days	0.007(S)
Time duration of hospital stay	06.26±1.05 days	07.00±1.16 days	0.029(S)
Post-operative wound infection	04.34%	08.69%	1(NS)
Post-operative pus collection	04.34%	0	1(NS)
Post-operative correction of depth of natal cleft	98.26%	86.52%	0.031(S)

S-Significant, NS-Not Significant

Discussion

Many surgical treatment methods have been described in the literature. Limberg flap method and Z-Plasty are two common methods used in surgical practice. This study was conducted to compare the two methods in different aspects to conclude which method is better. Definitive treatment is best provided when the patient first presents to the surgeon to avoid time lost from work and distress to the patient.

The disease is more common in men and between the ages of 18 and 29. Similar to our study by Chintapatla et al [3] demonstrated the predominance of male disease. The same was noted by Z.S. Matar [4] in the age group of 15 year to 32 year of age group and M.R.B. Keighley [5] in the 15 to 24 age group. "Jeep Bottom", as it is also called, is more common in subjects who sit for long periods of time. Our study reflects this entity [6]. It is visible the most common problems a patient may experience are pain, swelling, discharge, and presence sinus (single/multiple) in the natal cleft. Studies done by Bascom and Alan Klass definitely say this the disease is common in pubescent men with a deep natal cleft and the presence of a sinus (single and/or multiple) is an almost constant feature. It is reported to be more common in patients who have a high body weight index. In the study conducted by Cubukc [7] the occurrence of recurrence and complications is significantly higher in patients with a higher body mass index. Most of our patients were with dense body hair and a deep natal cleft. Mohamed MS

et al (2006) [8] in accordance with the above observations reported that 56.3% of patients had course hair density with a deep natal cleft and about three-quarters of these commonly involved the upper medial and lateral walls of the cleft.

In patients undergoing Limberg flap according to Akmal Jamal et al [9], the recurrence rate is 4.18%. High recurrence rate may be attributed to the incomplete excision of the sinus tract along with the high rate of postoperative complications such as infection, flap necrosis and wound dehiscence.

Hospitalization, wound healing, and time off work are relative measures of outcome. Irpatgire RN et al (2016) [10] found that the average length of postoperative hospital stay for patients was 3.4 days without complications and an average of 6.5 days in patients with Yildiz et al [11] shows that the length of hospital stay in patients treated with flap procedures are very less compared to patients who have undergone other procedures. Total time to wound/flap healing was significantly lower and postoperative correction the depth of the natal cleft is greater in patients undergoing the Limberg flap procedure than Z-Plasty. Necrosis was the complications in patients who underwent treatment for this disease. It's mainly because the occurrence of impaired blood supply during the formation of flaps.

Conclusions

The ideal procedure for the treatment of pilonidal sinus disease is not clear, but complete excision of the affected patient area, flattening the natal cleft, avoiding midline scarring and tension-free wound repair vascularized tissue appear to be essential features of any treatment for this disease. Now it is clearly shown better patient satisfaction with wound closure in the first place or using flaps after surgery rather than leaving it open. For simple non-recurrent pilonidal sinus, less invasive surgery with limited excision and primary closure might be enough. However, the benefits of Karydakis flap in recurrent and complicated cases are seen in different studies, although wound complications are similar to other flap methods. In conclusion, rhomboid excision and Limberg flap closure, with shorter operative time, shorter duration hospital stay, less postoperative complications, shorter time required for complete wound healing and more correction of the postoperative depth of the natal cleft is more suitable than Z-Plasty in the treatment of pilonidal sinus disease by an expert surgeon.

References

1. Hodges RM: Pilonidal sinus: Boston Med Surg J. 1880; 103:485-586.
2. Shabbir J, Chaudhary BN, Britton DC. Management of sacro-coccygeal pilonidal sinus disease: a snapshot of current practice. Int J Colorectal Dis 2011;26(12):619-20.
3. S. Chintapatla et al. Sacrococcygeal pilonidal sinus: historical review, pathological insight and surgical options. Tech Coloproctology. 2003; 7:3–8.
4. Z. S. Matar, Pilonidal sinus disease: a 5-year study, The Internet Journal of Surgery, 2007; 13(2):Article 33.
5. M. R. B. Keighley, Pilonidal sinus, in Surgery of the Anus Rectum and Colon, M. R. B. Keighley and N. Williams, Eds., WB Saunders, London, UK, 2nd edition, 1999; 539-563.
6. Bolandparvaz S, Moghadam Dizaj P, Salahi R, Paydar S, Bananzadeh M, Abbasi H, et al. Evaluation of the risk factors of pilonidal sinus: A single center experience. Turkish J Gastroenterol. 2012;23(5):535–7.
7. Shafik A. Electrocauterization in the Treatment of Pilonidal Sinus. International Surgery. 1996; 81:83.
8. M. M. S. Awad and K. M. Saad, does closure of chronic pilonidal sinus still remain a matter of debate after bilateral rotation flap? (N-shaped closure

technique), Indian Journal of Plastic Surgery, 2006; 39(2): 157–162.
9. Akmal Jamal et al. Open excision with secondary healing versus rhomboid excision with Limberg transposition flap in the management of sacro-coccygeal pilonidal disease. Journal of Pakistan Medical Association. March 2009; 59(3): 157-160.
10. Irpatgire RN, Chakrod SV. Limberg flap reconstruction following rhomboid excision of the sacrococcygeal pilonidal sinus. International Surgery Journal. 2016 Dec 8;3(2):846-9.
11. Yildiz MK, Ozkan E, Odabaşı HM, Kaya B, Eriş C, Abuoğlu HH, Günay E, Fersahoglu MM, Atalay S. Karydakis flap procedure in patients with sacrococcygeal pilonidal sinus disease: experience of a single centre in Istanbul. The Scientific World Journal. 2013.