ORIGINAL RESEARCH PAPER

Volume-7 | Issue-3 | March-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

MODIFIED LIMBERG'S FLAP OR EXCISION AND PRIMARY CLOSURE WHAT SHOULD ONE CHOOSE, OUR EXPERIENCE AT TERTIARY CARE HOSPITAL.

Surgery

Shahnawaz Mansoor Shah* Ex-Senior Resident department of general surgery SKIMS, Soura, Srinagar (J&k) *Corresponding Author

Tariq Hassan Dug Ex-Senior Resident department of general surgery SKIMS Soura, Srinagar (J&k)

Aijaz Ahmad Rather Professor and Head department of general surgery MCH Bemina, Srinagar (J&k)

Syed Rayees Ahmad Senior Senior Resident department of general surgery SKIMS, Soura, Srinagar (J&k)

ABSTRACT

Introduction: Pilonidal sinus (PNS) is a condition that refers to tract or cavity lying beneath the skin usually of sacrococigeal region, containing hair and is usually associated with repeated infection, discharge and abscess formation. It poses significant morbidity to the patient.

Aims and Objectives: The aim of this study was to compare Limberg's flap procedure with excision and primary repair in the management of sacrococigeal pilonidal sinus disease.

Material and methods: This study was conducted in Surgery Department SKIMS Medical College Bemina, Srinagar (J&K) during the period from January 2012 to March 2015. One hundred patients who were treated for pilonidal disease were eligible for the study. The patients were then randomized into two groups: group I underwent excision and primary closure; group II underwent modified Limberg's flap procedure.

Results: Comparing post-operative data from group I and group II patients, post-operative complications were lower in group II(Limberg flap)than group II patients(excision and primary closure).Operative time was significantly more in group II patients(p value <0.05) while as hospital stay and time to return work was significantly lower in group II patients(p value< 0.05).

Conclusion: Based on the results of this study, we suggest that wide excision with a modified Limberg transposition flap reconstruction is a very effective and excellent operative procedure for uncomplicated pilonidal sinus.

KEYWORDS

Pilonidal Sinus, Limberg flap, Excision and primary closure.

1. Introduction

Pilonidal sinus (PNS) is a tract or cavity that contains loose hair and is associated with repeated infection and abscess formation. It is the disease of the young adults. It is most frequently seen in the sacrococcygeal region. Estimated incidence is 26 per 1, 00,000 people. Etiology is uncertain but relates to the implantation of loose hair into the depth of natal crease. Other factors associated are increased sweating with sitting and friction, poor personal hygiene, obesity, local trauma, narrowness of natal cleft, etc. Implantation of hair leads to infection and abscess formation later leading to discharging sinus.Today's most widely accepted explanation for the pathogenesis of PNS was suggested by Karydakis who attributed the occurrence of PNS to three main factors: the invader (loose hair), the force (causing insertion) and the skin vulnerability (depth of the natal cleft) (1).

Surgical methods utilized for the management of PNS can be broadly categorized as midline closure techniques (with the wound lying within the natal cleft) or other techniques (where the wounds placed out with the midline)

Excision and primary closure involve excision of the entire sinus with closure of the wound. This procedure has the advantage of avoiding wound packing. One problem is that the incision tends to be situated in a deep midline cleft where there is tension and also the propensity to accumulate hair (2). Skin flaps have been described to cover a sacral defect after wide excision; this keeps the scar off the midline and flattens the natal cleft. The techniques available include the cleft closure, advancement flap (Karydakis procedure), local advancement flap (V-Y advancement flap), and rotational flap (Limberg flap, modified Limberg flap, gluteus maximusmyocutaneous flap) (3).The aim of this study was to perform a randomized clinical trial to compare the modified Limberg flap procedure with excision and primary closure in the treatment of uncomplicated pilonidal disease.

2. Methods

This study was conducted Surgery Department SKIMS Medical College Bemina, Srinagar (J&K) during the period from January 2012 to March 2015. One hundred patients who were treated for pilonidal disease were eligible for the study. The patients who presented with acute pilonidal abscesses were excluded from this study. Informed consent was obtained from all patients include in the study which was approved by the local ethics committee.

All patients were subjected to history taking, clinical examination and laboratory test. The patients were then randomized into two groups: group I underwent excision and primary closure and group II underwent modified Limberg flap procedure. All patients were operated under general anesthesia. Patients were placed in prone Jack-knife position with two adhesive straps applied to buttocks to pull them laterally for better visualization of the natal cleft. Shaving off the hairs around the sinus and cleaning the area with povidone iodine was done. Antibiotic prophylaxis of 1.2 g amoxicillin–clavulinic acid was given intravenously at the time of induction and continued for 48 h. Then this was changed to oral antibiotic form for five days.

2.1. Group I (excision and primary closure procedure)

Methylene blue was injected through the opening of the sinus for complete visualization of the tract; an elliptical incision in long vertical axis was used. The sinus along with infective debris and tuft of hair was excised up to presacral fascia. After achieving proper haemostasis, subcutaneous tissue was closed with 0 vicryl (polygalactin) and skin with interrupted 2-0 prolene (polypropylene). At the end of the procedure, a suction drain was inserted from a separate incision (Figure1a, 1b, 1c, 1d).

2.2. Group II (modified Limberg flap)

The skin around the sinus was marked by a pen as depicted in picture and methylene blue injected. Excision in rhomboid shape was performed in such a way BD =DE and CD is parallel to EF and AD =EF and a fasciocutaneous rhomboid flap is raised. The flap was transposed to the excised area; subcutaneous tissue was closed with 2-0 vicryl (polygalactin) and skin with2- 0 prolene (polypropylene) without tension, using interrupted sutures. Operative time was calculated from time of incision to closure of wound. Suction draine was put routinely in all patients. Patients were discharged when clinically fit after the operation and all patients were advised to visit the outpatient clinic after one week, then after 15 days, monthly for 3 months and 3 monthly for 3 years. Maximum follow-up was up to 36 months. All patients were recommended to walk freely but not to exercise until removal of stitches. All patients were advised to shave the area well around the

operative site at least monthly.

The duration of operation, length of hospital stay, duration of incapacity for work, postoperative complications (infection, flap edema, wound dehiscence etc) and postoperative recurrence were recorded. Duration of operation was defined as the length of time between the first incision and placement of the last suture. Duration of incapacity for work was defined as the time from the date of surgery to the date on which the patient returned to normal activities including employment and leisure activities. Infection was considered as leakage of purulent secretion through the surgical wound (Fig 2a, 2b, 2c).

3. Results

This study was conducted on 100 patients with uncomplicated sacrococcygeal pilonidal disease that were randomly allocated into two groups, group I (50 patients) who underwent excision and primary closure procedure and group II (50 patients) that underwent modified Limberg flap procedure.

In our study average age of group I male patients was 34.8 years (15-50 years), StDev 8.30 while that of female patients was 41.6 years (38-48 years) StDev 4.04.50% patients were in the age group of 31-40 years. Majority of the patients were males (90%) while as only 10% were female (Table 1)

In our study, patients had varied clinical presentation ranging from discharge, pain and abscess formation. Those patients with abscess formation were excluded from the study (Table 2).

All the patients of group I were subjected to excision and primary closure. Post-operative data is shown in table 3.

Infection was defined as purulent discharge from wound and confirmation by culture. More than 1 cm gapping was considered significant.

Operative time was calculated from the start of incision to the application of last suture. Average operative time was 44.6 minutes (40-50 minutes).Average hospital stay was 5.8 days (5-7days).Average time of removal of sutures was13.86 days (13-15 days).Time to return work was calculated from the day of admission. Average time to return work was 23.9 days (21-27days).

In our study, average age of group II male patients was 35.7 years(16-55 years),st dev 8.69,range 39,median 35 while that of female patients was 45.4 years(34-50 years),st dev 5.5,range 16,median 47.86% patients were male while as 14% patients were female(Table 4).

Infection was defined as purulent discharge from wound and confirmation by culture. More than 1 cm gapping was considered significant. Post operative data is shown in table 5. Average operative time was 67.26 minutes(50-80 minutes).Drain was removed at an average of 3.54 days(3-5 days).Mean hospital stay was 3.54 days(3-5 days).Sutures were removed at an average of 11.54 days(10-13 days).It took an average of 16.2 days(14-19 days) for the patients to return to their work.

4. Discussion

Pilonidal sinus disease is an acquired condition affecting young adults with high rate of morbidity that leads to long term loss of labor and earnings. It is a blind ended epithelialized tract that lies in skin of the natal cleft. Surgical treatment is preferred over conservative treatment. There are various risk factors associated with this disease like obesity, excessive hair, excessive sweating, poor personal hygiene and deep natal Clift. Hair acts as a foreign body and leads to inflammation, infection and abscess formation.PNS has varied clinical presentation ranging from asymptomatic state discovered by the patient itself, to acute perineum presenting as perennial suppuration or chronic stage characterized by recurrent infection and discharge from the sinus. Various surgical techniques have been advocated in the management of PNS.The goals of the ideal procedure should include short hospital stay, rapid healing of wound, less painful postoperative period, low risk of recurrence, low morbidity with few wound-management problems and allow the patient to resume normal daily activities as early as possible[4].Surgical techniques have been broadly categorized into midline closure techniques where after excision of PNS,wound is placed in midline and non-midline closure techniques where wound is placed in non-midline position. Complete excision of the sinus is widely practiced technique.Various techniques have been used to deal with the wound after excision [5].Excision and packing, excision and primary closure, marsupialization, and flap techniques are surgical procedures that have been developed for treatment of pilonidal sinus [6].

Excision and primary closure are known to provide quicker healing and quicker return to work. Most patients return to work in 3–4 weeks but recurrence rates of 7–42% have been reported following excision and primary closure [7, 8]

Since the source of the disease is thought to be natal cleft and deep intergluteal sulcus, the aims of the flap techniques should be natal cleft flatting, lateralization and fulfilling the defect without tension. Reconstruction of the defect with limberg flap has many advantages as it is easy to design, perform and learn even by general surgeons. It flattens the natal cleft with large vascularized pedicle, sutured without tension. Midline dead space and scar is avoided. This eventually helps in maintaining good local hygiene, reducing the friction between buttocks, preventing maceration. The use of thislocal flap accelerates healing. A number of studies have reported a recurrence rate of 0–3% after rhomboid excision and Limberg flap repair [9].

In our study average age of group I male patients was 34.8 years (15-50 years), StDev 8.30 while that of female patients was 41.6 years (38-48 years) StDev 4.04.50% patients were in the age group of 31-40 years. Majority of the patients were males (90%) while as only 10% were female. Post-operative from group I patients suggest that 26% patients had flap edema,16% patients suffered infection at the operation site,12% had gapping of the wound,4% patients developed seroma,4% patients developed necrosis and 10% patients faced recurrence of the disease. Operative time was calculated from the start of incision to the application of last suture. Average operative time was 44.6 minutes (40-50 minutes).Average hospital stay was 5.8 days (5-7days).Average time of removal of sutures was13.86 days (13-15 days).Time to return work was calculated from the day of admission. Average time to return work was 23.9 days (21-27days).

In our study, average age of group II male patients was 35.7 years(16-55 years),st dev 8.69,range 39,median 35 while that of female patients was 45.4 years(34-50 years),st dev 5.5,range 16,median 47.86% patients were male while as 14% patients were female. In group II patients, flap edema was present in 14% patients,10% patients suffered infection at the wound site,6% patients observed gapping at the incision site,6% patients developed seroma under flap,necrosis of the flap was seen in 4% patients,recurrence was seen in 4% patients. Average operative time was 67.26 minutes(50-80 minutes).Drain was removed at an average of 3.54 days(3-5 days).Mean hospital stay was 3.54 days(3-5 days).Sutures were removed at an average of 11.54 days(10-13 days).It took an average of 16.2 days(14-19 days) for the patients to return to their work. Average Operative time for group I patients was significantly lower than group II patients (p value<0.05) while as average hospital stay, average time to return to work was significantly lower in group II patients as compared to group I patients(p value<0.05). Post-operative complications were lower in group II (Limberg flap) than group II patients (excision and primary closure).

Excision and primary closure are known to provide quicker healing and quicker return to work. Most patients return to work in 3–4 weeks [11] but recurrence rates of 7–42% have been reported following excision and primary closure, while a number of studies have reported a recurrence rate of 0–3% after rhomboid excision and Limberg flap.

Gilani et al in their study on management of pilonidal sinus with excision and primary closure observed that recurrence of pilonidal sinus was noted in 9% of patients, wound breakdown occasioning delayed healing in 9%, patients able to drive by day 16 on average. The mean time to return to work was 20.5 days; duration of analgesia, 2.4 days; and duration of antibiotic treatment, 4.7 days [10]. Muzi MG et al carried the stud to compare the results of rhomboid excision followed by Limberg flap with that of excision and primary closure in patients with primary pilonidal sinus. A total of 120 patients with pilonidal disease were randomly divided into group A who underwent excision and primary closure ($n = 60$) and group B who underwent the rhomboid transposition flap procedure ($n = 60$). 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 ($P < 0.05$). During follow-up of 2 years, no recurrence was detected in patients in group B, whereas five patients developed recurrence in group A ($P = 0.02$). Limberg flap procedure is better than the simple excision and primary closure for the management of sacrococcygeal pilonidal disease [11]. AhmetSerdarKaraca et al carried a study on five hundred forty-nine patients who underwent surgery for pilonidal sinus between January 2007 and August 2012. The patients were classified into group I (excision and primary closure) and group II (Limberg flap).There was no significant difference in the mean age and gender of the patients between groups I and II (P = 0.512 and P = 0.472). The duration of surgical operation was lower in group I (P < 0.001). There was no significant difference in hospitalization time after surgery, minor complications, and recurrence between the groups (P = 0.674, P = 1.000, and P = 1.000, respectively). The time required for pain-free walking, urinating, and returning to work was significantly lower in group II (P < 0.001, P < 0.001, and P < 0.001, respectively). The patients in group I stated that they were more satisfied in terms of aesthetics (P < 0.001).According to the results of this study, Limberg flap method has better outcomes compared with excision and primary closure. Therefore, we recommend Limberg flap for treatment of pilonidal sinus disease [12].

5. Conclusion

Based on the results of this study, we suggest that wide excision with a modified Limberg transposition flap reconstruction is a very effective and excellent operativeprocedure for uncomplicated pilonidal sinus, associated witha low complication rate, short hospitalization and disability, early return to work and a low recurrence rate and recommend it for the management of uncomplicated pilonidal sinus disease.

Table 1: Age distribution of patients of Group I

Age group	N (%)	Male	Female
15-30	13(26)	13	-
31-40	25(50)	22	3
41-50	12(24)	10	2

Table 2: Clinical presentation of the patients

Clinical presentation	N
Discharge	76
Pain	24

Table 3:Post-operative data of Group I patient.

Post-operative complications	N (%)
Flap edema	13(26)
Infection	8(16)
Gapping	6(12)
Seroma	4(8)
Necrosis	4(8)
Recurrence	5(10)

Table 4: Age distribution of Group II patients

Age distribution(years)	N (%)	Male	Female
16-25	5(10)	5	0
26-35	17(34)	16	1
36-45	16(32)	15	1
46-55	12(24)	7	5

Table 5:Post-operative data of Group II patient.

Post-operative complications	N (%)
Flap edema	7(14)
Infection	5(10)
Gapping	3(6)
Seroma	3(6)
Necrosis	2(4)
Recurrence	2(4)

Fig 1a

Fig 1b

Fig 1c

Fig1d

Methylene blue dye is injected in to the tract to delineate it clearly followed by excision and primary closure.

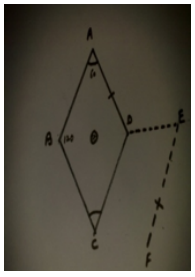

Fig 2a

Fig 2b

Fig 2c

Limberg's flap is marked before making incision (fig 2a), incision given (2b) and sinus excised and wound closed (fig 2c)

6. References

1. Aslam MN, Shoaib S, Choudhry AM. Use of Limberg flap for pilonidal sinus-a viable option J Ayub Med Coll Abbottabad. 2009; 21(4):31-3.
2. Pilonidal sinus after excision with closed or open treatment: final result of a randomized trial. Eur J Surg 1996; 162(3):237–40.
3. Spivak H, Brooks VL, Nussbaum M. Friedman I: treatment of chronic pilonidal disease. Dis Colon Rectum 1996; 39(10):1136–9.
4. Ersoy E, Devay AO, Aktimur R, DoganayB,Ozdogan M, Gundogdu RH. Comparison of the short-term results after limberg and karydakis procedures for pilonidal disease: Randomized prospective analysis of 100 patients. Colorectal Dis.2008; 11:705-10.
5. Spivak H, Brooks VL, Nussbaum M. Friedman I: treatment of chronic pilonidal disease. Dis Colon Rectum 1996; 39(10):1136–9.
6. Armstrong J, Barcia P. Pilonidal sinus disease. Arch Surg1994; 129:914–8.
7. Khaira HS, Brown JH. Excision and primary closure of pilonidal sinus Ann R Coll Surg Engl 1995; 77:242–4.
8. Iesalnieks I, Furst A, Rentsch M, Jauch KW. Primary midline closure after excision of a pilonidal sinus is associated with a high recurrence rate. Chirurg 2003; 74:461–8.
9. Azab AS, Kamal MS, el Bassyoni F. The rationale of using the rhomboid fasciocutaneous transposition flap for the radical cure of pilonidal sinus J Dermatol Surg Oncol 1986; 12:1295–9.
10. Gilani SN, Furlong H, Reichardt K, Nasr AO, Theophilou G, Walsh TN. Excision and primary closure of pilonidal sinus disease: worthwhile option with an acceptable recurrence rate. Ir J Med Sci 2011; 180(1):173–6.
11. Muzi MG, Milito G, Cadeddu F, Nigro C, Andreoli F, AmabileF, et al. Randomized comparison of Limberg flap versus modified primary closure for the treatment of pilonidal disease. Am J Surg 2010; 200:9–14.
12. Ahmet SerdarKaraca, Rıdvan Ali, MuzafferÇapar, and SezarKaraca,J Korean Surg Soc. 2013 Nov; 85(5): 236–239.