Section: Surgery

Original Research Article

MANAGEMENT OF PILONIDAL SINUS USING LIMBERG FLAP RECONSTRUCTION AT A TERTIARY CARE CENTER IN NORTH INDIA

Sheikh Viqar Manzoor[1], Mohammad Mohsin[2], Sonali Ohri[3], Ajay Kumar Thakral[4], Tajamul Rashid[2]

[1]Assistant Professor, Department of Surgery, HIMSR, New Delhi, India
[2]Associate Professor, Department of Surgery, HIMSR, New Delhi, India
[3]Assistant Professor, Department of Surgery, HIMSR, New Delhi, India
[4]Professor, Department of Surgery, HIMSR, New Delhi, India

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Corresponding Author:
Dr. Sheikh Viqar Manzoor,
Email: sheikhviqar36@gmail.com

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Abstract

Background: The study aimed to evaluate the efficacy of Limberg flap reconstruction in the management of pilonidal sinus in terms of surgical outcomes, complication rates, and recurrence at a tertiary care center in North India. **Materials and Methods:** This prospective observational study was conducted in the Department of Surgery, HIMSR, New Delhi, from January 2020 to April 2022. A total of 30 patients were included, consisting of 25 males and 5 females, with an average age of 25 years. Patients with both primary and recurrent pilonidal sinus disease were included, while those with infected disease (abscess) were excluded. **Result:** Among the 30 patients, 25 were males and 5 were females, with a mean age of 25 years (range: 15-35 years). Primary disease was observed in 24 patients, while 6 had recurrent disease. Postoperatively, patients were positioned prone on the day of surgery, allowed to lie sideways on postoperative day 1, and ambulation was initiated. Intravenous antibiotics and analgesics were administered postoperatively, followed by oral antibiotics and analgesics for 5 days. Drain removal was done on the 2nd or 3rd postoperative day based on output. The average hospital stay ranged from 4 to 7 days, and sutures were removed between 12 to 14 days. Follow-up assessments were conducted at 2 weeks, 6 weeks, 6 months, and 1 year. Complete wound healing was observed within 3-4 weeks. Minimal wound discharge occurred in 2 patients and was managed conservatively without wound dehiscence. **Conclusion:** Pilonidal sinus presents a significant challenge due to recurrent infections and persistent discharge. Limberg flap reconstruction is an effective technique that provides relief from symptoms, improves the quality of life, and offers a low recurrence rate. The procedure is relatively easy to perform, has a short learning curve, and is beneficial for both primary and recurrent cases. By ensuring meticulous skin closure and obliteration of the midline natal cleft, this technique minimizes complications and further reduces recurrence rates.

INTRODUCTION

The term pilonidal sinus refers to a condition found in the natal cleft (cleavage between the buttocks) over the coccyx, consisting of one or more, usually non-infected, midline openings, which communicate with a fibrous tract lined by granulation tissue containing hair lying loosely within the lumen.[1] It was first described by Hodges in 1880.[2] It is an acquired condition that is usually seen in young adults, especially in males. Patients usually complain of discharging sinus in the natal cleft. Occasionally, it may present as an abscess. Factors that can lead to the causation of pilonidal sinus include hairy skin, obesity, and friction.[3] It is more commonly found in males with a bimodal age distribution before puberty and after the age of 40 years.[4] The management includes clipping hairs with good hygiene of area, excision with primarily closure or excision with reconstructive flap techniques.[5] Reconstructive flap techniques include Limberg rhomboid flap, V-Y flap, Bascom technique etc. The most common type of reconstructive flap surgery is Limberg rhomboid flap. This technique was described by Limberg in the year 1946.[6] He described a technique for closing a 60 ° rhombus-shaped defect with a transposition flap. It was easy to perform, with sutures away from midline giving rise to tensionless flap of unscarred skin in the midline, that helps in good hygiene maintenance,

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reducing sweating maceration, erosions and scar formation.

The main concern with regards to treatment is recurrence. The literature review suggests that it ranges from 20-40% regardless of the technique used.[7] Leaving behind some tracts, sutures in midline causing more trauma with repeated infection, accumulation of perspiration and friction with tendency of the hair getting incorporated into the wound are few reasons attributing to recurrence.

MATERIALS AND METHODS

This was a prospective observational study conducted in the Department of Surgery, HIMSR, New Delhi from January 2020 to April 2022. The study included 30 patients of which 25 were males and 5 females. Average age was 25 years. All the patients with primary and recurrent disease were included in the study. Patients having infected disease (abscess) were excluded from the study.

Procedure

All the patients included in the study were admitted one day before surgery after pre-anesthetic clearance. All patients were informed about their inclusion in the study and both written and informed consent was taken. Preoperative preparation included shaving of hairs of the natal cleft in the morning of surgery along with a head bath. A prophylactic antibiotic was given intravenously to all patients 30 minutes prior to incision. All surgeries were done under spinal anesthesia. The procedure was done with the patient placed in prone position with buttocks strapped apart. Precision is important in flap surgeries, therefore marking of the flap was done before hand. A rhombic area of skin and subcutaneous fat was excised which included both midline pits with any lateral sinus extensions. The long axis of the rhomboid lies in the midline and its shape is determined by angles of 60 degree of point A and point C and 120 degree at point B and point D. Point C lies adjacent to perianal skin and point A is placed so that all diseased tissue is included in the excision. The line B-D transects the midpoint of A-C at right angles. The length of D-E is equal to A-B. E-F is parallel to D-C and is of equal length.

Skin and subcutaneous fat to be removed are excised down to preserving the deep fascia. The flap is raised so that it includes skin, subcutaneous fat and fascia overlying the gluteus maximus. It is then rotated to cover the midline rhomboid defect [Figure 2].

Romovac drain of 14-16 French is placed away from the suture lines and closure is done in 2 layers, inner layer is closed with absorbable suture (Vicryl 3'0) and outer layer is closed by monofilament, non-absorbable suture; Ethilon 3'0 [Figure 3].

RESULTS

A total of 30 patients were included in the study. Among them, 25 were males and 5 were females. The mean age was 25 years (range 15-35 years). Primary disease was present in 24 patients and 6 patients had recurrent disease. Post-operatively, patients were made to lie down in prone position on the day of surgery. On post-operative day 1, patients were advised to lie down sideways and ambulation was allowed. Two doses of intravenous antibiotics along with analgesics were given post-operatively and oral antibiotics and analgesics were continued for 5 days. Drain was removed on 2nd or 3rd postoperative day depending on the output. Average hospital stay was 4-7 days. Sutures were removed after 12-14 days. Patient were followed up in OPD at 2 weeks, 6 weeks, 6 months and 1 year. It took 3-4 weeks for the wound to heal completely [Figures 4 & 5]. Two patients had minimal wound discharge which was managed conservatively with daily dressings and there was no wound dehiscence. All patients returned to work within 2-3 weeks (average -17 days). There was no recurrence at 1 year follow up.

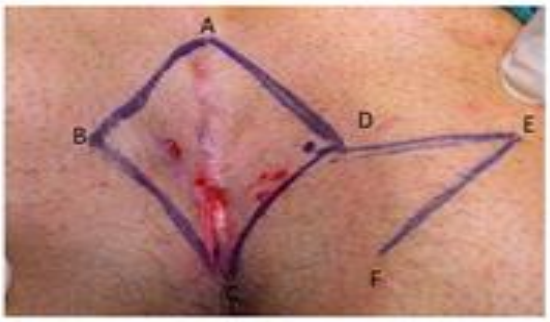

Fig 1 -The markings before performing the procedure

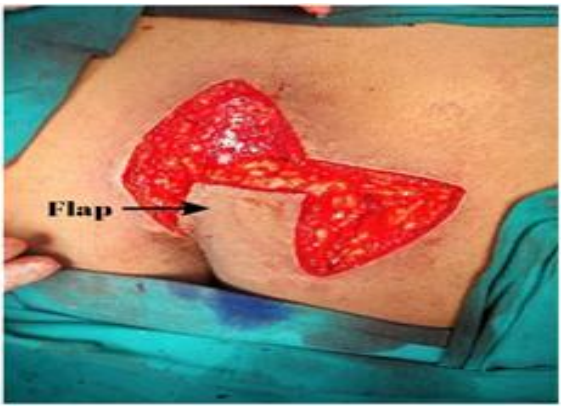

Figure 2: Intra-operative

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Figure 3. Immediate post-operative picture

Figure 4. 2 weeks postoperative status

Figure 5. 6 weeks postoperative status

Table 1: Patient Demographics.

Category	Count
Total Patients	30
Males	25
Females	5
Mean Age (years)	25
Age Range (years)	15-35

Table 2: Disease and Surgery Details

Category	Details
Primary Disease	24
Recurrent Disease	6
Post-Op Positioning	Prone on Day of Surgery
Ambulation Allowed	Day 1
Drain Removal	2nd or 3rd Post-Op Day
Average Hospital Stay (days)	4-7
Sutures Removed (days)	12-14

Table 3: Post-Operative Care

Category	Details
IV Antibiotics & Analgesics	2 Doses
Oral Antibiotics & Analgesics (days)	5
Wound Healing Time (weeks)	3-4
Minimal Wound Discharge Cases	2
Wound Dehiscence	None

Table 4: Follow-Up and Outcomes

Follow-Up Time	Outcome	Return to Work (days)
2 weeks	No Recurrence	17 (average)
6 weeks	No Recurrence	N/A
6 months	No Recurrence	N/A
1 year	No Recurrence	N/A

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DISCUSSION

Pilonidal sinus is described as a blind ending epithelial tract in the natal cleft, close to the anal verge, generally containing hair with a higher incidence in males.[8,9] The main factors responsible for the formation of sinus in the natal cleft are sweating, hirsutism, repeated trauma due to friction, all of which lead to breakage of the skin barrier and sucking of hair inside because of constant movement of buttocks during walking or other activities. This initiates a foreign body reaction leading to infection, abscess and ultimately to sinus formation. Patients usually present with chief complaints of pain and discharge in the area of natal cleft. The diagnosis is more often made by clinical examination only.[10] Surgical excision of the sinus (excision of diseased tissue up-to sacrococcygeal fascia) is the treatment of choice.[11] Limberg flap has many advantages because of which it is used for reconstruction of defect. Advantages include easy to perform and design, flattening natal cleft with large vascularised pedicle, sutured without tension. It reduces the friction, prevent maceration and avoids any scar in the midline. Limberg flap procedure is better than excision, closure and marsupialization,[10,11] and is even better than other flap procedures such as Bascom and Karydakis.[12,13] Many studies which reported recently about the usefulness of Limberg flap in treatment of sinus have been comparable with our study in terms of complications and recurrences.[14] Katsoulis et al had 25 patients, with 16 of them having complications with no recurrences.[14] Aslam et al had 110 patients, with 5 of them having complications and 1 recurrence.[15] Srikanth K. Aithal et al did a study with 30 male patients had one complication in the form of persistent discharge which lasted for 4 weeks and closed spontaneously with conservative management. They had no recurrences.[16] In our series we had two complex wound infections, three minor flap edemas, and one flap tip discharge—all healed in due time. No recurrence was reported so far.

CONCLUSION

Pilonidal sinus is a problem for both the patient and treating surgeon because of its repeated infection, persistent infection with discharge, and high recurrence rate with regular procedures. With the help of Limberg flap reconstruction after excision of pilonidal sinus, the patients got relieved from distressing and painful symptoms with improvement in quality of life. The technique is relatively easy to perform with relatively short learning curve. This procedure can be completed in quick time and is useful both in primary and recurrent diseases. This procedure has very low complication rate with very low recurrence documented worldwide, which are further reduced by meticulous skin closure, without skin edge eversion, with a wide flap to obliterate the midline natal cleft.

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