Original Article

Management of Sacrococcygeal Pilonidal Sinus Disease- by Limberg Flap Procedure - Personal Experience

Syeda Shahnaz Nasrullah[1], Nazmun Nahar[2], Narayan Chandra Sarker[3], Sohel Rana[4], Goutam Kumar Biswas[5]

Abstract:

Background: In this retrospective study clinical experience with a local flap procedure (Limberg flap reconstruction) for Sacrococcygeal Pilonidal Sinus Disease was represented. **Methods:** In this study 11 patients were treated with an age range of 21-35 yrs in the form of excision of Pilonidal Sinus followed by Limberg flap procedure in the same setting. The study consists of 6 recurrent disease and 5 primary disease in a time spam of March 2017 to January 2019. Cases were selected from Rangpur Medical College Hospital indoor patients and also from author's private patients. **Result:** All of the patients was successfully underwent surgery with minimum post operative pain, average hospital stay 2-3 days, stiches off done within 8th to 10th POD with an early return to work within 12-14 days. Among all the patients, 1 patient developed seroma and 1 patient developed wound infection, both of them managed conservatively. All of the patients followed up 6 months post operatively revealed both cosmetically and functionally acceptable results without any evidence of recurrence. **Conclusion:** Rhomboid flap closure technique is an effective and reliable technique for Sacrococcygeal Pilonidal Sinus Disease which could be easily performed with high patient's satisfaction, a low incidence of post operative complications associated with complete cure of the disease, less hospital stay with favorable results regarding the time before returning to work.

Indexing words: Pilonidal sinus disease, Limberg flap, Sacrococcygeal region

Introduction:

Pilonidal Disease is described as early as 1833 by Mayo. Hodge used the term "Pilonidal" (Latin term means nest of hairs) in 1880. Today it is describe as a wide variety of clinical condition ranging from asymptomatic hair containing cyst and sinuses to large symptomatic abscess usually of the sacrococcygeal region with a tendency for recurrence[1,2]. According to International Pilonidal Society 2013, some occupation related pilonidal sinus disease, occurs in webs of fingers eg. hair dresser, sheep shearer, dog groomer, slaughter man or milk man. Other locations include: shaft of the penis, axilla, intermammary area, groin, nose, neck, clitoris, suprapubic area, occiput, prepuce, chin, periungual region, face, breast and umbilicus.

Onset of this condition is rare before puberty and after the age of 40 for both sexes[3]. This disease usually present in the midline of the sacrococcygeal region of young hirsute men with at incidence of 20 per 100000 population[4,5]. There are 2 theories in relation to etiology, one is congenital and another is acquired. However it's mainly considered as an acquired condition characterized by an infection starts at natal cleft hair follicle which becomes distended with keratin leading to folliculitis, abscess formation which extends down into the subcutaneous tissue then hair can enter through tiny pit and lodge in abscess cavity due to suction effect created by movement of gluteal region[6].

Karydakis proposed three main factors for the occurrence of the disease, as follows, high quantity of hair, extreme force and vulnerability

1. Assistant Professor, Dept. of Surgery, Rangpur Medical College
2. Associate Professor, Dept. of Radiology & Imaging, Rangpur Medical College
3. Assistant Professor, Dept. of Medicine Rangpur Medical College
4. Junior Consultant, Dept. of Surgery Rangpur Medical College Hospital.
5. Anesthesiologist, Rangpur Medical College Hospital

to infection[7]. But the presence of hair in the gluteal cleft seems to play a significant role in the pathogenesis. Other factors including a deep natal cleft which acts as a suitable environment for sweating, maceration, bacterial contamination. Hair penetration, obesity, sedentary lifestyle, local trauma, positive family history, lack of hygiene and hirsutism also play roles[3].

Pilonidal disease is a medical condition that is liable for almost 15% of all anal suppurations[8]. Actually the diagnosis is mainly clinical. The treatment methods include both conservative and surgical. Recurrence rate is high, which requires appropriate reconstructive procedure[9,10].

Many methods of treatment have been described for the management of this disease including incision and drainage of acute pilonidal abscess, excision and healing by secondary intention, excision and partial closure or primary closure, Z-plasty, clipping of hairs with good hygiene of the area, marsupialization and flap techniques like Limberg flap, modified Limberg transposition flap, elliptical rotation flap and rotation advancement fasciocutaneous flap, Karydakis flap procedure, Bascom's flap[6,11].

Among different surgical techniques, flap reconstruction methods eradicate the etiology of the disease by flattening the intergluteal sulcus[12]. Among all of them, the most commonly applied technique is the Rhomboid excision with reconstruction by Limberg flap by which a tension free repair is made by using a wide well vascularized flap[13].

Methods:

In this retrospective study patients were operated on for sacrococcygeal pilonidal disease selected from Rangpur Medical College Hospital indoor patients and also from author's private practice. Eleven consecutive patients in between March 2017 and January 2019 among which 7 were male and 4 were female. Patients with primary and recurrent sacrococcygeal pilonidal sinus disease who were mentally oriented and consented for joining this research study were included in this study. Patients with incomplete data and patients who were lost to follow up were excluded from the study.

In this study, the average duration for symptoms was 1.5 years among them 6 patients (54%) had previous history of abscess drainage due to Pilonidal sinus disease. Detailed history taking, thorough clinical and local examination, laboratory, investigation was done to exclude other disease conditions that mimic pilonidal sinus. Written consent was taken from all the patients after informing them about the operative procedure and expected result of the flap in this area. All the patients were treated surgically by excision of sinus and primary repair by Rhomboid transposition flap.

Surgical Procedure:

All the patients were operated under spinal anesthesia placing them in prone position. The surgical area was exposed by lateral traction of the buttocks with adhesive tapes and cleaned with 10% povidone iodine. Using a sterile skin-marking pen a Rhomboid area of skin was marked over pilonidal sinus. The flap design was mapped on the skin. The vertical diagonal of the Rhomboid in midline was marked as A-C, The length of vertical diagonal was 10 cm. which may be extended to 11-12 cm. if there is any paramedian extension. Point C indicates the lower point of vertical diagonal adjacent to perianal skin. Point A is placed in such a way so that all diseased tissue can be included in the excision. Another line B-B′ transected the midpoint of A-C at right angles which was 60% of its length. The line B′-A′ was a direct continuation of the line B-B′ which was of equal length to the line A-B therefore B′-A′ =AB (to which it was sutured after rotation) =6.2cm. A′-D and A-B′ are of equal length. A-B′ was sutured to A-B′ after rotation (AB′=A′D= 6.1cm) as shown in Fig 1.

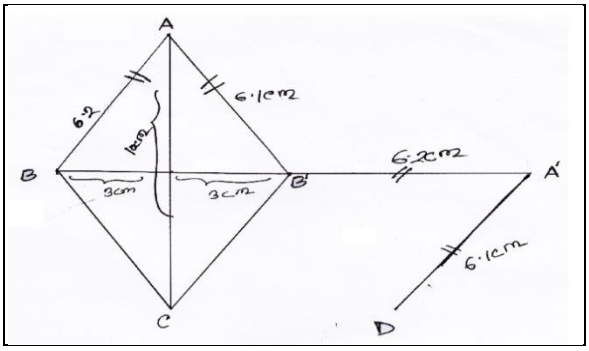


Fig. 1: Outline of rhomboid area of skin drawn during operation of pilonidal sinus disease

A rhombic shaped excision of the sinus bearing skin and subcutaneous tissue was made by electrocautery upto the presacral fascia. Then the perforator based Limberg flap was elevated in the same manner. The level of dissection was pre muscular fascia of Gluteus maximus muscle. After that the adhesive tapes of the buttocks were remove for well suturing of the flap without tension. Then finally a right or left sided fasciocutaneous Limberg transposition flap that incorporate the gluteal fascia was fully mobilized on its inferior edges and transposed medially. Thus the Limberg defect was made fulfill. Mean duration of operation was 45 minutes (35-75 minutes). A suction drain was usually required and removed after 3 days usually. Patient was advised not to give pressure on affected side for 3 weeks. All patients were advised to maintain their posture by lying left or right and used high commode.

Hospital Stay & Follow up

The patients were discharged at 2nd to 3rd POD after check dressing and stitch off done at 8th to 10th POD. They were followed up initially at 1 week then at 1 month, 3 months & 6 months which depends on both patient's requirement and according to surgeon's preference.

Results:

In relation to the gender the majority of the patients were male (7) and remaining were female (4) with an age range of 21 years to 35 years. The median ages of the patients were 20 years,

Table I: Patient criteria

		Number
Gender	M	7
	F	4
Age Range	20-30 yrs	6
	30-40 yrs	5

All the patients were followed up in a sequence of initially at 1 week, then at 1 month, 3 months and lastly at 6 months usually. Only 1 patient seroma and another 1 patient developed wound infection (Table II). The approximate time to resolve the seroma was 7-8 days and the surgical site infection was cured within 2 weeks.

Table II: Postoperative complications

Complications	Number	Percentage (%)
Seroma	1	9%
Wound Infection	1	9%
Flap necrosis	0	0%

The pain score range was in between 2-5 within mean score of 3.5 (Table III). The rest of the patients without complications underwent wound healing with minimal scar formation and less post operative pain without any recurrence.

Table III: Pain Score (According to NRS) (0-10 Numerical Rating Scale)

No. of Patients	Pain Score
1	3
2	5
3	2
4	4
5	3
6	2
7	4
8	3
9	5
10	4
11	3

Discussions:

Pilonidal sinus is a disease which is reported to occur in various regions of the body including umbilical region, inter digital and axillary region. But most commonly seen in the sacrococcygeal region in midline[14,15].

Pilonidal sinus disease is well known for its prolonged morbidity and recurrence with an important predisposing factor for sacrococcygeal disease recurrence is deep natal cleft and presence of hair within the cleft. Pilonidal sinus disease has been treated by different methods of surgical treatment, where the basic principal of treatment are tension free closure of the resultant defect with well vascularized tissue, obliteration of the natal cleft, prevention of

recurrence, maintaining short hospital stay and early return to work[16,17].

Methods of leaving the wound opened until formation of granulation tissue, covering the open wound with skin graft has disadvantage of longer healing time (3-8 weeks) and are not cost effective[14,15].

Wide local excision with primary closure of the wound resulting in midline scar which is associated with high incidence of recurrence[18]. In order to avoid the problem of midline scar formation, Karydakis technique, Bascom technique ivolved[1,7].

Although both of these techniques shift the scar from its midline to lateral position but often failed to obliterate the natal cleft completely leading to high recurrence rate[19-22]. Limberg flap reconstruction described by Azab and colleagues in 1984, achieves and off-midline closure and ensures flattening of the natal cleft[20]. There still debate regarding the best surgical technique for treatment of pilonidal sinus disease. Because an ideal operation should be simple, associated with less hospital stay with low recurrence rate. The Limberg flap is one of the transposition flap used after the excision of pilonidal sinus has proven to be effective for the management of primary and recurrence disease with quick healing time, less hospital stay, early recovery, low complication and recurrence rate.
An early development of seroma and hematoma formation is a recognized problem for flap reconstruction which leads to wound infection and flap necrosis. To prevent this, insertion of suction drainage has been used by many centers[23]. There are many previous studies based on this, where Katsoulis had 25 patients, with 16 of them associated with complications without recurrence and Aslam had 110 patients and 5 of them having complication and 1 with recurrence[24,25].

Limitation of the study: Small sample size.

Conclusion:
Sacrococcygeal Pilonidal sinus disease is a morbid disease associated with high recurrence rate. Different form of surgical approaches used to cure the condition but results are disappointing due to high recurrence rate and prolong hospital stay so it's a challenging situation for surgeons. In this context Rhomboid flap technique (Limberg flap transposition) has become widely accepted for it's advantage of early healing, very low recurrence rate, less hospital stay, easy operative procedure with high patient's satisfaction and low incidence of postoperative complications.

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