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Original Research Article

Management of pilonidal sinus disease with Limberg flap: our experience

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ABSTRACT

Background: Pilonidal sinus disease is a common disease of young adults. The management of the sacrococcygeal pilonidal sinus varies from conservative measures to various surgical procedures. The main concern for the treatment to the patient is the recurrence. Although several methods have been described all have been associated with high recurrence rates. This study was carried out to evaluate the advantages, results of rhomboid excision and limberg flap reconstruction in the management of pilonidal sinus disease.
Methods: This prospective study was conducted in General Surgery department of a tertiary care centre of Haryana. It includes 29 patients who were treated for pilonidal sinus disease by Limberg flap surgery from January 2015 to January 2019.
Results: All patients were successfully treated with minimal postoperative discomfort. Only two patients developed seroma which was managed conservatively and in two patients there was slight flap tip necrosis which was also managed conservatively. Rest all other patients wound healed nicely with minimal scarring, with very less postoperative pain, with no recurrence so far.
Conclusions: Limberg flap is very effective treatment for pilonidal disease. It has many advantages as it is easy to perform and design, and it flattens the natal cleft with large vascularized pedicle, sutured without tension. This in turn maintains good hygiene, reducing the friction, preventing maceration, and avoiding scar in the midline. The technique is easy to perform in quick time, useful in both primary and recurrent diseases, with very low complication and recurrence rate. Other advantages are quick healing time, short hospital stay, and early return to daily life.

Keywords: Limberg flap, Pilonisal sinus, Recurrence

INTRODUCTION

Sacrococcygeal pilonidal sinus is an acquired condition usually seen in the midline in young hirsute men. The estimated incidence is 26 per 1,00,000 population.[1] It generally presents as a cyst, abscess or sinus tracts with or without discharge. Men affected more often than women, rare both before puberty and after the age of 40 years.[2] The etiology of the pilonidal sinus is uncertain. Mayo in 1833, suggested that it was due to congenital origin secondary to a remnant of an epithelial lined tract from postcoccygeal epidermal cell rests or vestigial scent cells.[3] Now the view widely has been shifted toward acquired theory. A widely acceptable view is that they are caused by local trauma, poor hygiene, excessive hairiness, and presence of deep natal cleft.[4] Karydakis proposed three main factors causing the disease, namely high quantity of hair, extreme force, and vulnerability to infection. Other risk factors include obesity, local trauma or irritation, sedentary life style, family history and poor hygiene. It is widely accepted that a pilonidal sinus results from the penetration of shed hair shafts through

the skin of natal area, leading to an acute or chronically infected site presenting as abscess or sinus tract with or without discharge.[5]

Diagnosis is generally clinical and patient may present with a chronic inflammation or a sinus with persistent discharge or acutely there may be an abscess or multiple subcutaneous tracts. Sometimes hair can be seen projecting from the sinus opening.

The management of the sacrococcygeal pilonidal sinus varies from conservative measures like clipping of hairs with good hygiene of the area to surgical procedure like excision and packing, excision and primary closure, marsupialization, and newer flap procedures like Z plasty, V-Y plasty, but none is widely accepted.[6-7] The main concern for the treatment to the patient is the recurrence; the literature review suggested that it ranged from 20-40 % regardless of the technique used. An ideal operation should be simple, should not need prolonged hospital stay, should have low recurrence rate, and should be associated with minimal pain, wound care and decrease the patient's time off-work. In 1946, Limberg first described a technique for closing a rhombus-shaped defect with a transposition flap.[8] It meets the entire requirement for being the ideal procedure for sacrococcygeal pilonidal sinus if performed according to appropriate surgical principles.[9,10] This study was carried out to evaluate the advantages, results of rhomboid excision and Limberg flap reconstruction in the management of pilonidal sinus disease.

METHODS

This prospective study was conducted in a surgical unit of Pt. BD Sharma Postgraduate Institute of Medical Sciences, a tertiary care center from Haryana. It includes 29 patients who were treated for pilonidal sinus disease by Limberg flap surgery from January 2014 to January 2019. The protocol of this study has been approved by institutional ethical committee.

Inclusion criteria

Inclusion criteria were patients of all age groups who had complicated pilonidal sinus disease, patients with recurrence after some other procedure, patients who had failed conservative management.

Exclusion criteria

Patients with pilonidal abscess and patients with simple pilonidal sinus disease were excluded.

Patients who had pilonidal abscess were first managed by incision and drainage they later underwent definitive surgery. All patients were subjected to complete history taking and routine clinical, local examination and laboratory investigations. Written consent was obtained from all patients after explanation of the procedure and expected results of the flap in this area. Data of the patients were collected and were analysed.

Surgery was performed under general or regional anaesthesia. Patients were placed in prone jack-knife position with buttocks strapped for wide exposure. A rhombic area of skin is marked over pilonidal sinus involving all midline pits and lateral extension if any (Figure 1). The long axis of the rhomboid in midline is marked as A-C, C being adjacent to perianal skin, A placed so that all diseased tissues can be included in the excision. The line B-D transects the midpoint of A-C at right angles and is 60 % of its length. D-E is a direct continuation of the line B-D and is of equal length to the incision B-A, to which it will be sutured after rotation. E-F is parallel to D-C and of equal length. After rotation, it will be sutured to A-D (Figure 2).

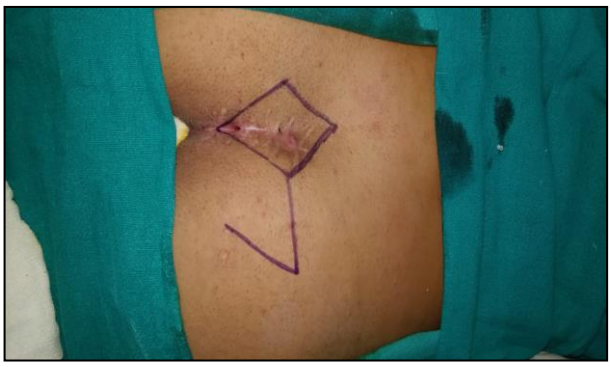

Figure 1: A rhombic area of skin is marked over pilonidal sinus involving all midline pits and lateral extension.

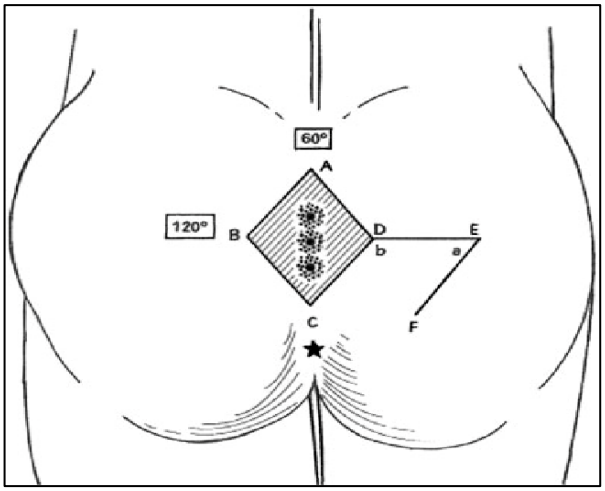

Figure 2: Preoperative marking.

The skin and subcut fat to be removed is excised down to deep fascia, and a rhomboid area of specimen including pilonidal sinus and its all extensions are removed (Figure 3). Then flap is raised so that it includes skin, subcut fat, and the fascia overlying gluteus maximus, rotated to cover midline rhomboid defect (Figure 4). The defect

thus created can be closed in linear fashion (Figure 5). Deep absorbable sutures to include fascia and fat are placed over a vacuum drain, and then finally the skin is closed in interrupted sutures. Postoperatively drain was removed after 48 - 72 hours. Antibiotics were continued for 7 days. Alternate sutures were removed on 10th postoperative day (POD). Rests of the sutures were removed on the 12th-14th POD.

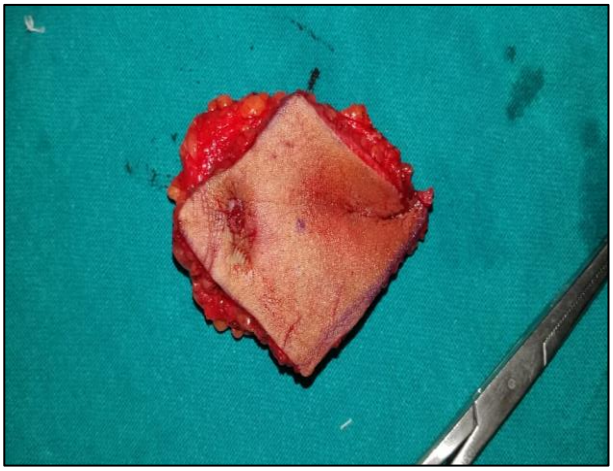

Figure 3: Excised rhomboid area of specimen including pilonidal sinus and its' all extensions.

Figure 4: Raised flap which includes skin, subcut fat, and the fascia overlying gluteus maximus, rotated to cover midline rhomboid defect.

Postoperatively patients are advised to avoid prolonged sitting or exercise for two weeks. Hair removal either by shaving or by hair removal cream is advised for at least 1 month. Patients are followed up in OPD monthly for 6 months. All the patients were evaluated for flap healing, seroma formation, oedema, flap necrosis, surgical site infection, pain and length of hospital stay and any recurrence. The objective grading of pain was done by visual analogue scale. The patients were followed at 1 and 6 months after surgery.

Figure 5: Closed defect with negative suction drain.

RESULTS

Twenty-nine patients were operated by rhomboid excision and Limberg flap reconstruction. Among them 27 were males and 2 were females. Youngest patient was of 15 years and oldest was of 50 years. Mean age was 27 years. Out of twenty-nine patients, 22 were having primary disease whereas rests were having recurrent disease. Discharge from natal cleft was the most common presenting symptoms.

Table 1: Demographics of patient.

Demographic	
Mean age (years)	27 (15-46)
Gender	
Male	27 (93.1)
Female	02 (06.9)
Primary disease	22 (75.8)
Secondary disease	07(24.2)
Total patients	29

Table 2: Presenting symptoms.

Presenting symptom	Number of patient
	N (%)
Discharge	19 (65.5)
Pain	06 (20.6)
Pilonidal abscess	04 (13.9)

Operative time ranged from 50 minutes to 80 minutes. Mean operative time was 56 minutes. Hospital stay was ranged from 4 days to 10 days. Mean hospital stay was 5.6 days.

Most wound healed in two weeks and patient return to normal activity within 3 weeks. Only two patients developed seroma which was managed conservatively. In two patients there was slight flap tip necrosis. Tip of the

flap which was towards anus was slightly necrosed which was managed conservatively. Rest all other patients wound healed nicely with minimal scarring, with very less postoperative pain, with no recurrence so far after follow up of atleast one year.

Table 3: Postoperative data.

Operative time	50-80 min (mean 56 min)
Hospital stay	4-10 days (mean 5.6 days)
Drain removal	3-4 days
Stitch removal	12-14 days

Table 4: Postoperative complications.

	N (%)
No complication	25 (86.2)
Seroma	02 (6.9)
Drain removal	02 (6.9)
Recurrence	Nil

DISCUSSION

Pilonidal sinus disease is a disease of young population causing significant morbidity. There is a long list of surgeries being performed for this disease but high recurrence rate and associated morbidity reflects the need for a safe and efficient surgical method for this entity. Recurrence is the main problem associated with all surgeries described which ranged from 21.4% to 100% for incision and drainage, 5.5% - 33% for excision and opens packing, 8% for marsupilisation, 3.3% - 11% for Z plasty.[11] The ideal treatment should ensure low pain, short hospitalization period, low risk of complications, rapid return to normal activities, better cosmesis, and should have a low recurrence rate.[12]

It has been realized now that the midline natal cleft should be avoided for suture placement as it is the site for recurrence. Moreover a deep natal cleft is the predisposing factor for pilonidal sinus.[13] To minimise the recurrence, the emphasis should not only be on flattening the natal cleft but also of achieving an off-midline closure of the resultant defect in order to minimize wound-related complications and recurrence.[14] Flap techniques especially Limberg flap reconstruction achieves an off-midline closure and ensures flattening of the natal cleft and have been associated with lower complication and recurrence rates.

Table 5: Results of previous studies on Limberg flap.

Authors	No. of patients	Hospital stay (days)	Complications (%)	Recurrence (%)
Katsoulis et al[13]	25	4	16	Nil
Akin et al[17]	411	3.2	15.75	2.91
Urhan et al[15]	102	3.7	7	4.9
Mentes et al[10]	238	2-3	2	1.26
Aslam et al[14]	110	3	5	1
El-khadrawy[16]	40	5-11	40	10
Present study	29	5.6	13.8	Nil

In the past various studies have documented superiority of this procedure over simple excision and closure, marsupialization and other flap procedures such as Bescom and Karydakis. Several series with the rhomboid or rhombic flap technique, including more than 50 cases, have reported recurrence rates of 1% to 7%. Akin et al operated on 411 patients and reported recurrence rates of 2.91%.[15] El-khadrawy operated on 40 patients and had superficial necrosis at the tip of the flap in four patients (10%).[16] In present series total 29 patients were present among which 2 (8%) patients had complications like seroma formation and 2 (8%) had minor flap tip necrosis which was managed subsequently. None of the patients reported recurrence. So, the results were comparable to them.

CONCLUSION

Reconstruction of the defect with Limberg flap has many advantages as it is easy to perform and design, and it flattens the natal cleft with large vascularized pedicle, sutured without tension. This in turn maintains good hygiene, reducing the friction, preventing maceration, and avoiding scar in the midline. The technique is easy to perform in quick time, useful in both primary and recurrent diseases, with very low complication and recurrence rates, which further can be reduced by meticulous skin closure, without skin edge eversion, with a wide flap to obliterate the midline natal cleft. Other advantages are quick healing time, short hospital stay, and early return to daily life.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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