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OUR EXPERIENCE OF LIMBERG FLAP IN TREATMENT OF PILONIDAL SINUS: A CASE STUDY OF 100 PATIENTS OPERATED IN A TERTIARY CARE CENTRE IN NORTH INDIA

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Abstract:
Pilonidal sinus is an acquired condition which is caused due to prolonged sitting and most commonly seen in males with excessive hair in natal cleft region. Its aetiology is controversial. This study of ours is a retrospective case study done at safdarjung hospital, New Delhi on patients who have been operated between january 2015 to december 2018 for pilonidal sinus as Pathology, technique of preference is limberg flap and post operatively follow up done for 6 months to look for post operative recurrence, complications like wound infection, pain relief and return to work. All this data was collected from on table findings, post operative duration of stay and follow up in Outpatient basis. A total of 100 patients were operated using rhomboid excision of the pilonidal sinus followed by Limberg rotational flap. The male to female ratio was 93:7. The average duration of stay in hospital was 4 days. Seroma was formed in two patients and suture line dehiscence was seen in two patients and the complications were managed conservatively. Patients returned to work post operatively after rest of 3 weeks as been prescribed in follow up. No delayed complication in the form of recurrence was noted. Overall, in our experience limberg flap reconstruction for pilonidal sinus surgery is effective and highly reliable method with minimal post operative complications and patient satisfaction.
Keywords: pilonidal sinus, limberg flap, prone position.

Introduction

Pilonidal sinus (JEEP BOTTOM) is a common condition seen in sacrococcygeal region of young hirsute men[1,2]. The latin meaning of pilonidal sinus is 'nest of hairs'[1]. Male: Female ratio is 2:1[2]. Total incidence is 26 per 10^5 population[1,2]. It was first time described by Mayo in 1833 who described it to be a congenital condition secondary to the remnant of epithelial remnant of post coccygeal epidermal cell rests[3]. Contradicting the congenital theory, Karydakis postulated the etiology of pilonidal sinus to be because of 1) high quantity of hair, 2) local trauma and 3) vulnerability to infection [3]. Moreover since the congenital tracts don't contain hair and are lined by cuboidal epithelium, the latter theory is accepted globally. Deep natal cleft and poor hygeine also a add to the etiology. However in some studies it has also been described in axilla, suprapubic area, periumbilical zone and fingers of hands in barbers[2].

Simplest of methods of treatment of pilonidal sinus is either wide local excision or opening of the track. But these are associated with high recurrence rates (20-40%) and problems of repeated sokage. The complex procedures performed are Bascom, Karydakis and Limberg rhomboid flap[3].

Limberg in 1946 introduced this procedure in which the pilonidal sinus was excised in rhomboid fashion followed by rotational flap[3,4] . Literature showed that this procedure was an effective procedure for treatment with less recurrence rates and good patient compliance. In this study, we are going to present our experience in performing the same.

OBJECTIVES:

1) To look for post operative complications
2) To look for recurrence rate post procedure in a follow up of 6 months.
3) To look for efficacy of procedure.

MATERAL &METHODS:

This is a retrospective descriptive study performed in Safdarjung hospital, New Delhi on patients who presented to us with complaints of pain, palpable mass or pus/ watery discharging sinus in the natal cleft region. This study was performed from january 2015 to december 2018 over 100 patients who were operated after routine workup.

The patients were given spinal anaesthesia then the position was converted to prone jackknife position with buttocks separated apart such that the operating surgeon is standing in between two legs. The long axis of the rhomboid was in midline with 60° angle at A and C determining the shape of the rhomboid along with 120° at B and D(figure 1). First line AC was drawn using sterile marker such that the point A includes all the diseased tissue and point C is adjacent to perineal skin. Line BD was such that it was perpendicular to and approximately 60% of the length of AD. BD was extended in equal distance to the right side such that BD = DE. Then a line parallel to AD was drawn from E at an angle equal to ABD(60°) and length equal to AD and the distal point was marked F (figure 1 & 2).

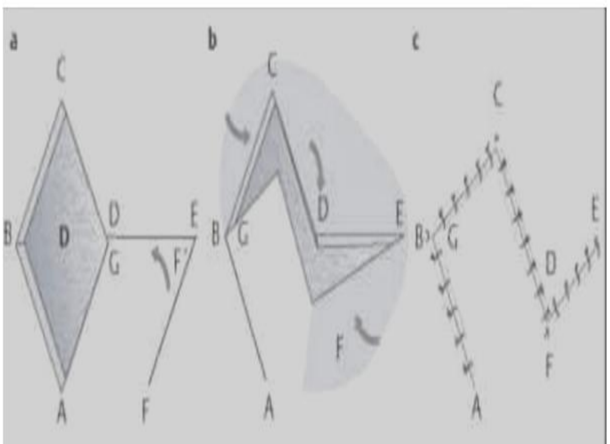

Figure 1: dimensions for forming rhomboid excision and flap reconstruction

The tissue in rhomboid ABCD was excised deep upto the sacral fascia such that whole of the pathology was removed. Then the flap wass constructed by incising along DE and EF such that the gluteal muscle fascia is reached. Then a flap drain is placed before suturing . The line below DE is sutured along BC, AD is sutured along AB such that first subcutaneous vicryl followed by nylon 2-0 was applied. Patients were instructed to lie prone on bed and intravenous antibiotics were given for 3 days post which drain was removed(output nil/ <10 ml). Patient was discharged on oral antibiotics along with strict instructions of lying prone at night. The alternate skin sutures were removed on day 10 and then toyal sutures were removed on day 14. Patients were asked for avoiding work for 3 weeks.Patients were asked to follow up after 2 weeks and then after 3 months and 6 months. The data was collected from inpatient and outpatient records and following results were compiled.

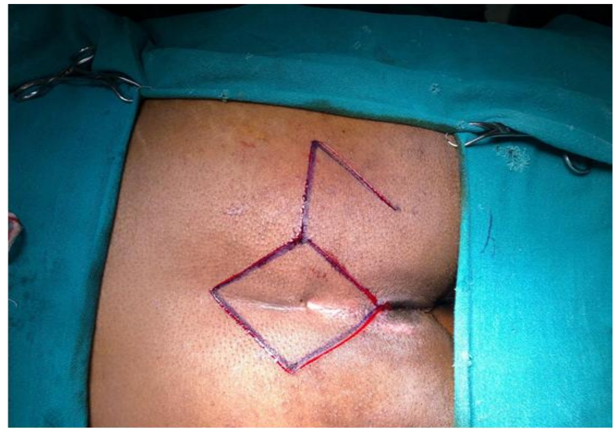

Figure 2: incision given on a patient in sacrococcygeal region.

RESULTS:

A total of 100 patients were opeated from january 2015 to december 2018 for pilonidal sinus using limberg flap and were followed up till 6 months post surgery. The following findings were noted:-

Table 1: male: female ratio

Males	Females
93	**7**

Hence ratio of male:female is 13.28:1 indicating that the incidence of disease is more in males than females.

Table 2: post operative complications:-

Complication	Frequency
1. Seroma	2
2. Wound infection	2
3. Recurrence	0
4. Flap necrosis	0
5. Normal course	96

Seroma and wound infection (seen in 2 patients each) were managed conservatively and the treatment showed 96% success rate.(figure 3)

Figure 3: patient with limberg flap on post operative follow up at 10th day.

There was no long term recurrence till the follow up of 6 months.

DISCUSSION:

Pilonidal sinus is a blind ending track with origin in natal cleft and constitutes of hair follicles [2]. Earlier being thought to be congenital, over years the etiology has shifted to acquired origin with excessive hair, poor hygeine, deep natal cleft (leading to vaccum effect which sucks in dirt and anaerobic bacteria) and male sex being predisposing factors[5,6].

The ideal treatment of treatment of the pilonidal sinus is excision of track along with the branches. But the question remained that what is to be done of the large gaping wound. Excision with primary closure, excision with marsupialization, etc were some of the techniques used by surgeons which were associated with post operative morbidity in the form of tension suturing, wound discharge, wound infection and recurrence (Obeid et al noted no recurrence in midline sinus excision) [7]. Bascom, based on his hypothesis which stated that infection starts in the hair follicles which lead to sinus formation, recommended opening of midline pit followed by lateral open drainage of any associated abscess[8] . Karydakis treated by using lateral incision followed by excision of the sinus and primary closing the incision. This flattened the natal cleft, prevented hair penetration into natal cleft and scar was also transferred laterally from the midline[6].

V- Y plasty, Z – plasty, W – plasty and flap techniques were used in past to treat pilonidal sinus with varied success rate. Limberg or adiop- fasciocutaneous flap technique is one of the highly recommended techniques for treatment as it is associated with low infection rates, low recurrence rates, short hospital stay and better aesthetic results. Some complications like wound infection, flap necrosis, wound dehiscence, seroma formation, etc are present but they can be reduced by meticulous steps in surgery and post operative wound care.

In our study we greatly emphasised on technique, post operative wound care and post operative instructions at time of discharge to the patient. Hence, there were no recurrences in our study and 96 out of 100 patients had no morbidity. Only 4 patients had minor complications in the form of seroma(2) and wound infection(2) which were managed conservatively.

Comparison with other studies is given in table 3.

Table 3: comparison with other studies:-

S. No	STUDY	Year of study	Patients	Recurrence (%)	Complications (in %)
	Hoehn et al[9]	1977	14	7	??
	Azab et al[10]	1984	30	0	17
3)	Gwynn et al[11]	1986	20	5	??
4)	Manterola et al[12]	1991	25	0	0
5)	Ersan et al[13]	1995	92	0	0
6)	Bozkurt et al[14]	1998	24	0	0
7)	Urhan et al[15]	2002	102	4.9	7
8)	Mentes et al[16]	2004	238	1.26	2
9)	Katsoulis et al[17]	2006	25	0	16
10)	Akin et al[18]	2008	411	2.91	15.75
11)	Aslam et al[19]	2009	110	1	5
12)	El – Khadrawy et al[20]	2009	40	10	40
13)	Srikanth et al[3]	2013	30	0	16.66
14)	Yogishwarappa et al[2]	2016	52	0	11.4
15)	**Our study**	**2019**	**100**	**0**	**4**

CONCLUSION:

In conclusion we can say that Limberg flap for treatment of pilonidal sinus is a very effective technique for complete removal of pilonidal sinus with minimum post operative complications and minimal chances of recurrence.

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