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Original Research Article

Pilonidal sinus and use of Limberg flap: a three years' experience from two tertiary care centres of Northern India

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ABSTRACT

Background: Pilonidal sinus is a common chronic inflammatory anorectal condition that arises usually in the natal cleft of the sacrococcygeal region. This disease leads to deterioration not only in professional life of young adults but in their personal life as well. The Limberg flap reconstruction is a frequently used procedure in pilonidal sinus. This aim of this study was to observe the usefulness of Limberg flap technique in treatment of pilonidal sinus in our setup.
Methods: This study enrolled a total of 50 patients who underwent Limberg flap surgery for sacrococcygeal pilonidal sinus over a period of 6 years in two different tertiary care hospitals of northern India. Various factors were studied in this study which included age group, gender, operative time, length of hospital stay, post-operative complications, recurrence and time required for return to normal work and activities. All the data was tabulated and analysed.
Results: In this study we found that the maximum number of patients were young males in their third decade of life who presented with complaints of discharging sinus, pain and infection. The Limberg flap technique was used in these patients which showed a good outcome as far as complication rates and recurrence rates were concerned. Also return to work in these patients was quite early when compared with other methods in literature.
Conclusions: In this study, we can conclude that this procedure is relatively easy to perform with a shorter learning curve, fewer complication rates, faster healing and is associated with a shorter hospital stay.

Keywords: Pilonidal sinus disease, Rhomboid excision, Limberg flap

INTRODUCTION

First official description of Pilonidal sinus dates back to 1847, when Abraham Wendell first gave a detailed overview of this condition.1 Pilonidal sinus is a common chronic inflammatory anorectal condition that arises usually in the natal cleft of the sacrococcygeal region. Other areas where it can occur, although rarely includes axillary area, interdigital web, intermammary area and umbilicus.[2-4] It can occur as asymptomatic sinus, chronic sinus disease and acute abscess/ as recurrence.[5] However, the most common clinical presentation is the chronic sinus disease.[6] It is most common in young adults who are in their second and third decade of life with an incidence rate of around 25/ 1 lakh population.[5] Females are 2-3 times less commonly affected as compared to males.[7]

The various causes of pilonidal sinus are mentioned in literature which includes inadequate personal hygiene, obesity, prolonged sitting, and hirsutism, deep natal cleft and local irritation. This disease also goes by the name of Jeep seat disease which was given to it by the American military surgeons during the second world war, because of its association with the Jeep drivers.[8,9]

The aetiology relates to the penetration of loose hair into the depth of the natal crease. According to Karydakis, three important factors that influence the formation of a pilonidal sinus are the force of implantation, the nature of the hair itself and the vulnerability of the skin.[10]

Whatever the mode of presentation, the pilonidal sinus is typically accompanied by one or multiple midline pits, in communication with the deeper cavity by a tract that is often epithelialized. The presence of hair debris, exiting from the pits and/or the cutaneous orifices, and easy to remove with forceps, is equally characteristic. This disease leads to deterioration not only in professional life of young adults but in their personal life as well.

From simple shaving to complex flap procedures, many surgical procedures have been described for treatment of pilonidal sinus including phenol application, incision and curettage, unroofing and curettage, excision with primary closure, excision with marsupialization, vey flap reconstruction, Bascom procedure, Limberg flap reconstruction, modified Limberg flap reconstruction, Karydakis flap reconstruction, modified Karydakis flap reconstruction and musculocutaneous flap reconstruction.[11]

All surgical treatments have their own advantages and disadvantages. The ideal surgery in this scenario would be a quick procedure with minimal hospitalization and little loss of work so that patients could return quickly to their normal day to day activities, with minimum morbidity, mortality and chances of recurrence.[12] Conservative management is rarely advocated nowadays, and most of the patients are offered surgical treatment.[13] The Rhomboid excision and Limberg flap is a frequently used procedure in pilonidal sinus. Being very easy to perform and design, it has been widely advocated for treatment of this condition by several researchers in literature.[14,15] In this technique, a 60° rhomboid shaped transposition flap is used to close the defect in natal cleft.[16] The advantage in such type of closure is that it flattens the natal cleft which eventually helps in maintaining local hygiene. As the friction between the buttocks reduces, it leads to reduction in humidity, maceration, erosions and scar formation at the natal cleft. If performed according to appropriate surgical principles, Limberg procedure can become gold standard procedure in treatment of sacrococcygeal pilonidal sinus disease, with minimal complication and recurrence rates.[17]

This aim of this study was to observe the usefulness of Limberg flap technique in treatment of pilonidal sinus in our setup.

METHODS

Study design

This was a prospective observational study.

Study area

It was a two-centre study that was conducted in department of general surgery in two tertiary care hospitals of northern India namely government medical college, Srinagar and government medical college, Jammu respectively.

Study duration

This study was done over a period of six years from June 2014 to June 2020.

Sample size

It consisted of 50 consecutive patients who underwent Limberg flap surgery for pilonidal sinus in sacrococcygeal natal cleft.

Inclusion criteria

All those patients who underwent Limberg flap surgery for pilonidal sinus in sacrococcygeal natal cleft were included in this study.

Patient with active suppurative condition were excluded from the study.

Exclusion criteria

Pilonidal sinus in any other site except sacrococcygeal region were excluded from this study.

Methodology used

All those patients who were enrolled in this study were subjected to a detailed history and clinical examination prior to surgery. All the baseline haematological investigations were done necessary for surgery and anaesthesia. A detailed and informed written consent was obtained from all the patients before subjecting the patients for surgery.

Various factors were studied in this study which included age group, gender, operative time, length of hospital stay, post-operative complications, recurrence and time required for return to normal work and activities. All the data was tabulated and analysed.

Operative technique

Patients who were enrolled in this study were either subjected to a spinal or a general anaesthesia. A preoperative injectable antibiotic was given before the induction. The position of the patient during surgery was jack-knife with buttocks pulled apart to gain better access to natal cleft. The excision site and the flap were firstly designed using a marker and a scale. Methylene blue was thereafter injected into the sinus tract to delineate the whole tract so as to facilitate the total excision and lessen the recurrence rate. The midline area containing the sinus tract was excised in the shape of a rhomboid deep to the presacral fascia keeping in view that whole of the tract was excised. There after a flap was raised lateral to the site of excision similar in area of excision with its blood

supply from its base. The area of excision was closed by this flap and the remaining site of harvest was closed primarily in two layers.

Figure 1: Limberg flap after rhomboid excision.

A suction drain was kept before closing so as to reduce the chances of hematoma and seroma formation underneath the flap (Figure 1). This drain was removed after 48 hours or when there was minimal drainage in few cases. Sutures were removed on 14th day in most cases. Patients were kept under antibiotic cover for a period of 15 days which included intravenous antibiotics for first five days. Patients were regularly followed up over a period of one year for any complication.

RESULTS

After applying the exclusion criteria, this study enrolled a total of 50 patients who underwent Limberg Rhomboid Flap surgery for sacrococcygeal pilonidal sinus over a period of 6 years in two different tertiary care hospitals of northern India. Out of 50 patients, 40 were males while 10 were females with a male to female ratio of 4:1 (Table 1). Most of the patients belonged to third decade of life with the youngest patient being a 16 years old boy and the oldest patient being a 46 years old male.

Table 1: Age and gender of the patients.

Age group (years)	Male	Female	Total
<10	0	0	0
11-20	7	2	9
21-30	23	6	29
31-40	6	2	8
41-50	4	0	4
>50	0	0	0
Total	40	10	50

The foremost complaint of all patients was a discharging sinus. Other complaints included chronic pain, infection and prior history of acute suppurative condition. Patients who presented with active suppurative condition were however excluded from this study (Table 2).

Table 2: Chief complaints of patients.

Chief complaints	Number
Discharging sinus	38
Chronic pain	18
Infection	14
Prior history of suppurative condition	6

The average operative time in this study was 51±7 minutes with shortest surgery being of 39 minutes and the longest being 76 minutes (Table 3). The drain was removed on 2nd-3rd day in most patients. However, three of our patients required a drain for more than three days on account of output greater than 20 ml/24 hours.

Table 3: Operative time.

Operative time (minutes)	Number
40-60	29
60-80	14
>80	7
Total	50

The average post-operative hospital stay was three days. There were postoperative complications in 5 patients in our study in form of seroma formation, flap necrosis and wound sepsis. All the patients were managed conservatively. None of our patients have developed a recurrence till date (Table 4).

Table 4: Post-operative complications.

Complications	Number
Seroma formation	2
Flap necrosis	1
Wound sepsis	2
Hematoma formation	0
Recurrence	0

Majority of the patients were able to resume their normal day to day activities within 12 days and their work within 18 days on an average. Those patients who developed complications had a delay of one more week in this regard (Table 5).

Table 5: Return to work.

Days	Number
10-14	23
15-19	20
>19	7
Total	50

DISCUSSION

Pilonidal sinus disease is an irritating chronic disease which not only causes psychological trauma but also loss of working hours especially in the productive younger age group. Many surgical procedures have been devised to treat this disease which have been mentioned earlier. This study was done to observe the various parameters associated with Limberg flap closure for sacrococcygeal pilonidal sinus.

In this study, we found that the maximum number of patients belonged to the third decade of life and accounted for 58% of the total study pool. It was also seen that majority of the patients were males. The ratio of male to female patients being 4:1. Similar findings have been described by many authors in the literature.[18,19]

Patients of pilonidal sinus often comes with the chief complaints of discharge via sinus. Less commonly they can come with an abscess formation with pain. Although fever is a rare presentation in such patients. In our study majority of the patients came with chief complaints of discharging sinus. Patients with active suppurative conditions were not included in this study. However, such patients were initially treated by incision and drainage and broad-spectrum antibiotics. Later on, after the suppurative condition was resolved, then only they were posted for definitive surgical management. Pain and infection were the other complaints with which patients chiefly came.

The mean operating time in this study was around 51±7 minutes. The shortest time being 39 minutes while the longest time of surgery being 76 minutes. This can be corroborated with the earlier studies which have shown an average time required for this surgery to be 29-54 minutes.[20-22] There were relatively fewer complications in our study. Two patients had seroma formation; 2 patients had wound sepsis while 1 patient had flap necrosis. However, all these patients were treated conservatively with broad spectrum antibiotics. The complication rate was thus calculated to be 10 %. It is worth mentioning here that none of the patients had a recurrence till date and there was no incidence of hematoma formation. These findings are similar to that of Alvandipour et al who in their comparative study have zero recurrence rate and a complication rate of 14.8% in Limberg flap as compared to Karydakis flap which showed a complication rate of around 40% and a recurrence rate of around 2.7% in their study.[23]

In this study, the average hospital stay period postoperatively was around 3±1.5 days and the mean time to return to normal day to day activities was around twelve days while all the patients returned to their work by eighteen days. An exception to this was those patients who developed complications postoperatively and required a longer postoperative stay and a week more to return to their normal activities. These findings could be corroborated with the earlier studies done by Abu Galala et al.[24] who found that the Limberg flap group returned to work a mean of nine days earlier than the deep suturing group (23 days).

Limitations

This study suffers from limitations of having a small sample size which could not be a representative for the whole population. Although there were no cases showing recurrence, the follow up period was short to establish this fact. Larger sample studies with longer follow up periods are requiring to ascertain the facts in our region.

CONCLUSION

Pilonidal sinus is a chronic inflammatory disease causing a lot of distress to the patients. Limberg flap reconstruction after rhomboid excision is a very effective and time-tested procedure for pilonidal sinus disease. The procedure is relatively easy to perform with a shorter learning curve and is associated with a shorter hospital stay. It also permits an early return to complete activity, fewer complication rates and faster healing. The procedure does not require prolonged postoperative attention and has a very low recurrence rate and postoperative morbidity.

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REFERENCES

1. Corman ML. Classic articles in colonic and rectal surgery. Pilonidal Sinus. Dis Colon Rectum. 1981;24:324-6.
2. Ohtsuka H, Arashiro K, Watanabe T: Pilonidal sinus of the axilla: Report of five patients and review of the literature. Ann Plast Surg. 1994;33(3):322-5.
3. Ballas K, Psarras K, Rafailidis S. Interdigital pilonidal sinus in a hairdresser. J Hand Surg Br. 2006;31(3):290-91.
4. Lee PJ, Raniga S, Biyani DK, Watson AJ, Faraghern IG, Frizelle FA. Sacrococcygeal pilonidal disease. Colorectal Dis. 2007;10:639e52.
5. Bendewald FP, Cima RR. Pilonidal disease. Clin Colon Rectal Surg. 2007;20(2):86-95.
6. Kanat BH, Bozan MB, Yazar FM, Yur M, Erol F, Özkan Z et al. Comparison of early surgery (unroofing-curettage) and elective surgery (Karydakis flap technique) in pilonidal sinus abscess cases. Ulus Travma Acil Cerrahi Derg. 2014;20:366-70.
7. McCallum I, King PM, Bruce J. Healing by primary versus secondary intention after surgical treatment for pilonidal sinus. Cochrane Database Syst Rev. 2007;17:CD006213.

8. Doll D, Matevossian E, Wietelmann K, Evers T, Kriner M, Petersen S. Family history of pilonidal sinus predisposes to earlier onset of disease and a 50% long-term recurrence rate. Dis Colon Rectum. 2009;52:1610-5.
9. Louis A. Buie. Classic articles in colonic and rectal surgery. 1890-1975: Jeep disease (pilonidal disease of mechanized warfare). Dis Colon Rectum. 1982;25(4):384-90.
10. Karydakis GE. Easy and successful treatment of pilonidal sinus after explanation of its causative process. Aust N Z J Surg. 1992;62:385-9.
11. Armstrong JH, Barcia PJ. Pilonidal sinus disease, the conservative approach. Arch Surg. 1994;129:914-7.
12. Søndenaa K, Andersen E, Nesvik I, Søreide JA. Patient characteristics and symptoms in chronic pilonidal sinus disease. Int J Colorectal Dis. 1995;10:39-42.
13. Holmebakk T, Nesbakken A. Surgery for pilonidal disease. Scandi J Surg. 2005;94(1):43-6.
14. Mohamed HA, Kadry I, Adly S. Comparison between three therapeutic modalities for non-complicated pilonidal sinus disease. Surgeon. 2005;3(2):73-7.
15. Jamal A, Shamim M, Hashmi F, Qureshi MI. Open excision with secondary healing versus rhomboid excision with Limberg transposition flap in the management of sacrococcygeal pilonidal disease. J Pak Med Assoc. 2009;59:157-60.
16. Azab AS, Kamal MS, Saad RA, Abou al Atta KA, Ali NA. Radical cure of pilonidal sinus by a transposition rhomboid flap. Br J Surg. 1984;71(2):154-5.
17. Kapan M, Kapan S, Pekmezci S, Durgun V. Sacrococcygeal pilonidal sinus disease with Limberg flap repair. Tech Coloproctol. 2002;6(1):27-32.
18. Karydakis AM. Flap operation for chronic pilonidal sinus. Pak J Surg. 2007;23(1):65-9.
19. Tavassoli A, Noorshafiee S, Nazarzadeh R. Comparison of excision with primary repair versus Limberg flap. Int J Surg. 2011;9(4):343-6.
20. Bessa SS. Comparison of short-term results between the modified Karydakis flap and the modified Limberg flap in the management of pilonidal sinus disease: a randomized controlled study. Dis Colon Rectum. 2013;56:491-8.
21. Bali İ, Aziret M, Sözen S, Emir S, Erdem H, Çetinkünar S et al. Effectiveness of Limberg and Karydakis flap in recurrent pilonidal sinus disease. Clinics (Sao Paulo). 2015;70:350-5.
22. Can MF, Sevinc MM, Hancerliogullari O, Yilmaz M, Yagci G. Multicenter prospective randomized trial comparing modified Limberg flap transposition and Karydakis flap reconstruction in patients with sacrococcygeal pilonidal disease. Am J Surg. 2010;200:318-27.
23. Alvandipour M, Zamani MS, Ghorbani M, Charati JY, Karami MY. Comparison of Limberg Flap and Karydakis Flap Surgery for the Treatment of Patients with Pilonidal Sinus Disease: A Single-Blinded Parallel Randomized Study. Ann Coloproctol. 2019;35(6):313-8.
24. Abu Galala KH, Salam IM, Abu Samaan KR, El Ashaal YI, Chandran VP, Sabastian M. Treatment of pilonidal sinus by primary closure with a transposed rhomboid flap compared with deep suturing: a prospective randomised clinical trial. Eur J Surg. 1999;165(5):468-72.

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