



Original Article

Treatment of Pilonidal Sinus by Limberg Flap-Only Hope of Cure (Study of 50 Cases)

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ABSTRACT

Background : Pilonidal sinus was first described by Dr. A.W. Anderson in 1847 and is often seen in the intergluteal region. It is a disease of mainly younger male and rarely affects after 40. Main causes for the formation of this sinus are hirsutism, sweating in the area, repeated maceration due to trauma, leading to breakage of the skin barrier, attracting hair inside which initiates a foreign body reaction leading to infection with abscess or sinus formation. Most common embarrassing situation is discharging sinus. The diagnosis is mainly on clinical ground. Though there are a lot of modalities of treatment but recurrence is still a challenge. We have adopted Limberg flap technique since 2012 with a least recurrent chance.

Objectives : To prove that this procedure will be end up with lower morbidity & least chance of recurrence

Methods : This prospective study was done jointly by the Department of Surgery of Central Medical College and Comilla Medical College Hospital. In this series 50 patients were selected from July 2012 to June 2017.

Results : Out of 50 patients operated by Limberg flap technique 42(84%) were males and 8(16%) were females. Mean age was 27.3 years (range 18–37years). Of them, 12(24%) were driver, 6(12%) police, 6(12%) teacher, 6(12%) student, 5(10%) worker, 4(8%) military army, 4(8%) housewife, 4(8%) service holder, 2(4%) computer operator, 1(2%) doctor and 1(2%) were barber. In our study most common mode of presentation were chronic discharging sinuses 15(30%), beside this 12(24%) had multiple sinuses, 10(20%) had multiple pits, 7(14%) had acute abscess and 6(12%) had unpleasant smell. Associated hirsutism were present in 30(60%) and absent in 20(40%) patients. One (2%) male patient had wound gap & discharge and six(12%) patients had flap edema. We have found no recurrence in follow up period.

Conclusion : Pilonidal sinus is a notoriously recurrent disease, so treatment by this flap technique is the only hope of cure with lower morbidity.

Key Words: Pilonidal sinus, hirsutism, discharging sinus, recurrence, Limberg flap.

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Introduction

The term 'pilonidal sinus' describes a condition found in the natal cleft consisting one or more midline openings, which communicate with a fibrous track lined by granulation tissue containing hairs¹. The word "pilonidal" comes from the Latin pilus-"hair";nidus-"nest"². The incidence of pilonidal disease is highest in white males(3:1 male:female ratio) between the ages of 15 and 40³. 82% occur between the ages of 20 to 29 years¹. Dark haired hirsute men are more affected

than softer blond hair¹. The condition is not seen before puberty and over the age of 45 years⁴. Once it was thought to be a congenital condition that developed along an epithelialized tract of the natal cleft³, now acquire theory denotes that frictional forces generated in the depths of natal cleft tend to drive hairs subcutaneously where they generate a foreign body reaction². Hair from the surrounding skin pulled into the abscess cavity during walking and secondary infection may compound the problem leading to abscess formation^{3,2}. Most common site is natal cleft overlying the coccyx or lower sacrum (jeep disease¹), but may be found in interdigital space (barber's nodule⁴), umbilicus and axilla. Common mode of presentation is acute abscess⁵ (pain, redness, swollen skin, a high temperature of 38⁰ C (100.4⁰ F) or above, a feeling of heat at the site of the wound, fluid, pus or blood leaking from the site of the wound, an unpleasant smell coming from the site of the wound⁶), chronic discharging multiple sinuses, pain & tenderness over the lower sacrum. Though diagnosis is mainly clinical, but differential diagnosis like fistula-in-ano, hidradenitis suppurativa, actinomycosis, tuberculosis should be excluded³. Complications of pilonidal sinus may be multiple discharging sinuses & pits in natal cleft, chronic recurrent abscess, soiling of clothing, malignancy & with a high rate of recurrence⁷.

Mainstay of treatment is surgery but medical treatment (depilation cream, phenol injection, fibrin glue, radiofrequency and laser ablation) are evolving. Among a number of surgical procedure deroofting & lay open, marsupialization, modified Bascom's procedure, Karydakias flap & Limberg flap are widely practiced⁸.

In 1946, Limberg first described a technique for closing a 60° rhombus-shaped defect with a transposition flap⁹. This flap was easy to perform, with sutures away from the midline giving rise to a tensionless flap of unscarred skin in the midline, which helps in good hygiene maintenance, reducing sweating maceration, erosions, and scar formation. Complications of the operation include wound abscess, gap, discharge and flap edema, necrosis¹⁰.

The aim of this study is to show that this procedure will be end up with a better outcome and a least chance of recurrence. We were combined with the Department of Surgery of Central Medical College and Comilla Medical College Hospital selected 50 patients

according to some inclusion and exclusion criteria for five years (From July 2012 to June 2017). Very few works have been done on the treatment of pilonidal sinus in Bangladesh. This problem requires to be studied more for its further development in our country.

Methods

This is a prospective type of observational study. The study was conducted on 50 patients admitted in the Department of Surgery of Central Medical College Hospital & Comilla Medical College Hospital from July 2012 to June 2017 who were treated for pilonidal sinus disease by Limberg flap. Patients who had pilonidal abscess were first managed by incision and drainage they later underwent definitive surgery.

All guardian of the patients were given an explanation of the study and informed consents were obtained. Their knowledge and attitude about inclusion and exclusion criteria were assessed by taking interview using a standardized questionnaire.

Inclusion criteria-

- Patients willing to give written informed consent
- Presence of recurrent pilonidal sinus
- Adult (over 16 years and under the age of 40 years) undergoing surgery for recurrent pilonidal sinus
- No infection at time of surgery

Exclusion criteria-

- Patients not willing to give informed consent
- Age less than 16 years
- Patient presenting with different conditions mimicking pilonidal sinus
- Chronic medical conditions, such as renal failure, or immunosuppression

Surgical Technique

The patient was put in prone position, under SA with buttocks strapped apart using 1/0 cutting silk (Fig-3). A rhombic area of skin is marked over pilonidal sinus involving all midline pits and lateral extensions if any (Fig-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 (Figs. 1 and 2).



Figure 1. *Initial marking*



Figure 2. *Marking with letters*

The skin and subcutaneous 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 (Fig. 3). Then flap is raised so that it includes skin, subcutaneous fat, and the fascia overlying gluteus maximus, rotated to cover midline rhomboid defect (Fig. 4). The defect thus created can be closed in linear fashion (Fig. 6). Deep absorbable sutures to include fascia and fat are placed

over a vacuum drain, and then finally the skin is closed in interrupted/continued sutures (Fig 6, 7).

The operation produces a tension-free flap of unscarred skin in the midline (Fig. 9). Antibiotics were given for 3 days initially intravenously, then orally, suction drain removed after 2 days, sutures removed around 10th day. The patient was advised not to put pressure on the flap for 3 weeks.



Figure 3. *Excision till deep fascia*



Figure 4. *Raising of flap and rotating over the defect*

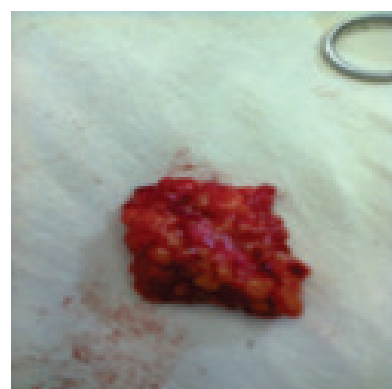


Figure 5. *Excised primary site*



Figure 6: *Final appearance after suturing*



Figure 7: *Appearance of wound after removal of drain*



Figure 8: *Finally application of proper bandage*



Figure 9. *Complication: Discharge from the wound gap*



Figure 10. *Final scar of the wound*

Results

In this study 50 patients were included. Among them 42(84%) were males and 8(16%) were females. Mean age was 27.3 years (range 18–37years). Of the 50 patients,12(24%) were driver,6(12%) police,6(12%) teacher,6(12%) student,5(10%) worker,4(8%) military army,4(8%) housewife,4 (8%)service holder,2(4%) computer operator,1(2%) doctor and 1(2%) were barber. Most of the patients were from average socio-economic status 28(56%), 11(22%) poor and 11(22%) were rich. In our study most common mode of presentation were chronic discharging sinuses 15(30%), beside this 12(24%) had multiple sinuses, 10 (20%) had multiple pits,7(14%) had acute abscess and 6(12%) had unpleasant smell. Associated hirsutism were present

in 30(60%) and absent in 20(40%) patients. Most of the patients 25(50%) had primary disease, 20(40%) had recurrent disease after previous treatment, and 5(10%) came up after having previous incision and drainage for abscess.

All patients came with pilonidal sinus, from July 2012 to June 2017, were assessed for its operability and investigated, and then they underwent Limberg flap procedure under spinal anaesthesia. Postoperatively patient made to lie on sides, then made them ambulant after first postoperative day, with drain in situ. The patient received antibiotics and regular dressing of the wound. Drain was removed approximately on the 2nd or 3rd post-operative day, following which the patient got discharged with advice of not to pressure for 3 weeks. Most patients admitted in hospital for 3-4 days. Sutures were removed during follow-up around 10th day. All patients are followed up initially in 1st month, then on 6 month, for 1st year, 3rd year & 5th year. One (2%) male patient had complication—wound gap & discharge. It took 2 weeks to heal completely with diligent dressing and usage of antibiotics. Six (12%) patients had flap oedema, which resolved by 10 days. All other patients' wound healed nicely with minimal scarring, with very less postoperative pain, with no recurrence so far in 5 years follow up. None needed readmission due to pilonidal sinus, and most patients returned to work after 3 weeks.

Graphical representation of the study(n=50):

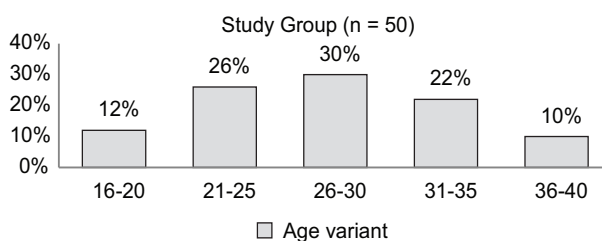


Figure 1. *Age distribution at the time of presentation*

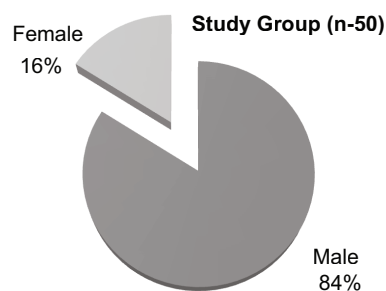


Figure 2. *Sex variation of the study*

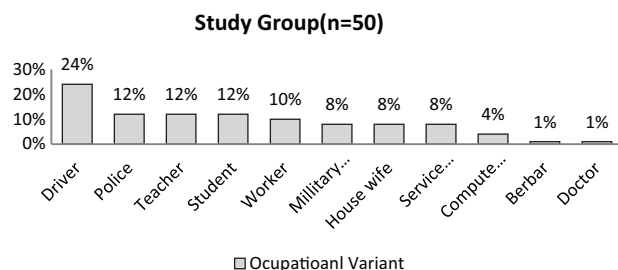


Figure 3. Occupational status of the study

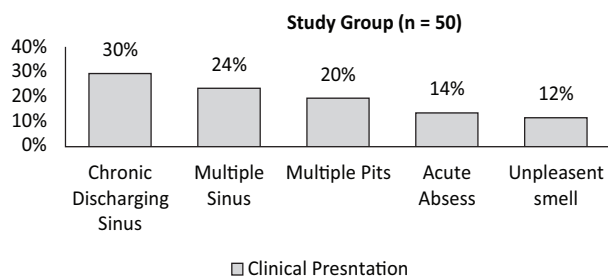


Figure 4. Different mode of presentation of the study group

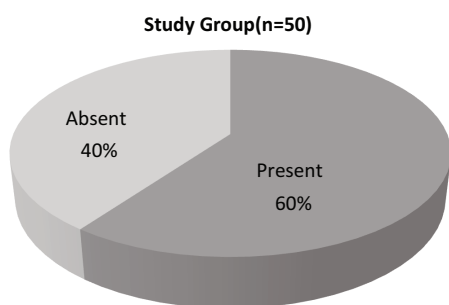


Figure 5. Associated condition(Hirsutism) present in the study

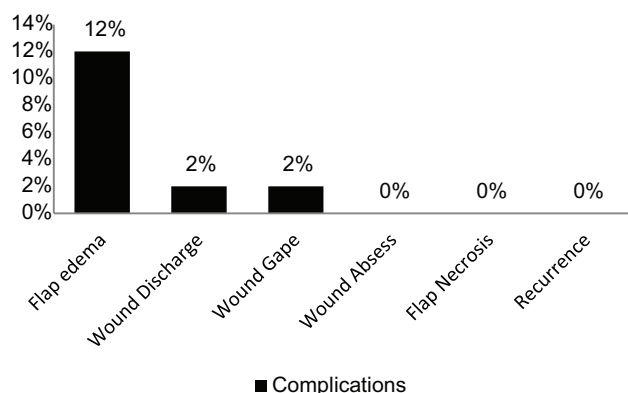


Figure 6. Complications occur in the study group (n=50)

Discussion

This prospective study was carried out jointly by Department of Surgery of Central Medical College & Hospital and Comilla Medical College & Hospital, where 50 patients were taken as sample. All the patients were subjected to excision of pilonidal sinuses & reconstruction by Limberg flap technique under subarachnoid block. All the patients were evaluated by a standard methodology. All the patients were given intravenous antibiotic for 2 days & oral form upto 10 days. Patients were under follow up by a standard protocol, but most of the patient did not follow the schedule. In our perspective those who did not come according to follow up schedule we think they have no recurrence.

In this study mean age was 27.3, most common age group was 26-30 years of age(30%). Where Ýlhan Bali et al, were shown their mean age 25.5¹¹. Male, female incidence were 42(84%) and 8(16%) respectively. Srikanth K et al, were shown in their study 80% and 20% respectively¹². 12 patients were driver (24%) which were similar to it is a disease of jeep drivers¹.

Socioeconomic condition of most of the patients were average(58%). Most common presenting features were chronic discharging sinuses(30%) and others were multiple sinuses(24%), multiple pits(20%), acute abscess(14%), unpleasant smell(12%). T. Yildiz et al, were shown in their series most common presenting features were Acute pilonidal abscess, Chronic pilonidal disease, Complex or recurrent pilonidal disease¹³. Of them 30 patients(60%) had hirsutism. Where Srikanth K et al, described the main causes for the formation of this sinus are hirsutism¹².

By this technique we had some complications like flap edema (12), wound discharge (2%), wound gap(2%) which were managed conservatively. But we were not seen any flap necrosis, wound abscess. But Katsoulis, had 25 patients, with 16 of them having complications with no recurrences¹³. Aslam had 110 patients, with 5 of them having complications and 1 recurrence¹⁴. Pilonidal sinus has a significant propensity to recur, in this regards we have no recurrence in our follow up period of five years observation. Mentis et al, Ersoy et al, and Campbell et al, reported that modified Limberg flaps presented lower recurrence and complication rates than KF in their respective series. The reported recurrence rate for Limberg flap varies from 0.8 to 2.7%. Topgul et al. operated on 200 patients, and the recurrence rate

was found to be 2.5%. Daphan et al. operated on 147 patients with a median follow-up time of 13.1 months, and recurrence was noted in 4.8% of patients¹¹.

Surgical treatment for this sinus is by the way of excision of the diseased tissue down to the sacro-coccygeal fascia, but the next step of what to do with defect is a matter of concern. In this regard, one has to take into account of patient compliance, postoperative pain, infection and recurrence rates, hospital stay, frequent wound dressings, and cosmetic outlook with preservation of the bottom.

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. This flap procedure found better than simple excision and closure, marsupialization,^{11,12} other flap procedures such as Bascom and Karydak^{13,14}. Several series reported recently about the usefulness of this flap in treatment for sacro-coccygeal pilonidal sinus have been comparable with our series in terms of complications and recurrences. No recurrence was reported so far in our five years follow up.

Conclusion

Sacro-coccygeal pilonidal sinus is headache to both the patient and the treating physician because of its repeated infection, persistent pain with discharge, and high recurrence rates with regular procedures. Limberg flap reconstruction technique is easy to perform in quick time, useful in both primary and recurrent diseases, with very low complication and recurrence rates. Other advantages are quick healing time, short hospital stay, and early return to daily life.

References

- Williams SN, Bulstrode KJC, O'Connell RP. The anus and anal canal. In: Lunniss P and Nugent K. Bailey & Love's short practice of surgery. 26th ed. Tylor and Francis Group; NW, 2013: p 1244-45.
- Cuschieri A, Steele CJR, Moossa RA. Disorders of the anal canal. In: Robert J, Csteele, K Campbell. Essential surgical practice. 4th ed. Arnold publishers Ltd, 2002: p 641.
- Doherty MG. Current surgical diagnosis & treatment. In : Welton ML, Chang GJ, Shelton AA. Anorectum. 12th ed .McGraw Hill Companies, 2003: p 756-57.
- Lumley JSP. Anorectal and vaginal examination. In: Hamilton Bailey's physical signs. 18th ed. Butterworth-Heinemann, 1997: p 326.
- Farquharson M, Moran B. Surgery of the anus and perineum canal. In: Farquharson's textbook of operative general surgery. 9th ed. Edward Arnold (publishers) Ltd, 2005: p 456-57.
- NHC choices. Pilonidal sinus. Available at: <https://www.nhs.uk/conditions/pilonidal-sinus/treatment>. [Accessed on December 20, 2017]
- Spalding MC, Pilonidal Disease. Medscape. Updated: Feb 14, 2017. Available at: [https://emedicine.medscape.com/article/192668-treatment;PilonidalDiseaseTreatment & Management](https://emedicine.medscape.com/article/192668-treatment;PilonidalDiseaseTreatment&Management). [Accessed on December 20, 2017]
- Pilonidal. Available at: pilonidalsinus.treatment.com. [Accessed on December 20, 2017]
- Anthony PS. Rhombic Flaps. Medscape. Updated: Aug 07, 2017. Available at: <https://emedicine.medscape.com/article/879923-overview#a8>[Accessed on December 20, 2017]
- Mcgregor IA. Neoplastic conditions. In: Fundamental Techniques of Plastic Surgery. 10th ed. Elsevier Ltd, 2010: p 161.
- Yihan Bali, Mehmet Aziret, Selim Sözen, Seyfi Emir, Hasan Erdem, Süleyman Çetinküner, and Oktay Yrkörücü. Effectiveness of Limberg and Karydak flap in recurrent pilonidal sinus disease. Clinics (Sao Paulo). 2015 May; 70(5): p 350-55.
- Srikanth K. Aithal, C. S. Rajan, and Narender Reddy. Limberg Flap for Sacrococcygeal Pilonidal Sinus a Safe and Sound Procedure. Indian J Surg. 2013 Aug; 75(4): p 298-01.
- T.YildizZ. Ilce küçük. Modified Limberg flap technique in the treatment of pilonidal sinus disease in teenagers. Journal of Pediatric Surgery. 2014;49: 11: p 1610-13.
- Mehmet ZS, Aylin S, Ozgur D, Mehmet FB, Girayhan C, Isa S. Recep C. Eyedrop-shaped, modified Limberg transposition flap in the treatment of pilonidal sinus disease. Asian Journal of Surgery. 2015 July;38(3): p 161-67.