

## LIMBERG'S FLAP/RHOMBOID FLAP RECONSTRUCTION PROCEDURE FOR SACRO-COCCYGEAL PILONIDAL SINUS- (A SINGLE CASE STUDY)

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### ABSTRACT

Pilonidal sinus disease is infective origin and occurs in sacral region between the buttocks. It is epithelium lined tract, situated short distance behind the anus, containing hairs and unhealthy diseased granulation tissue. It is due to penetration of hairs through the skin into subcutaneous tissue. It forms unhealthy granulation tissue in the deeper plane. It is common in 20-30 years of age. It is common in males and mostly affects hairy men. *Aacharya Sushruta* has described a minimally invasive Para-surgical procedure *Kshar-Sutra* procedure for *Nadivrana*. *Sushruta* has also advocated *Chedan Karma* (Excision of PNS tract with lay open). This procedure is good, safe, less expensive, very less or no recurrence rate, less discomfort but prolonged recovery time and changing *Kshar Sutra* in every seven day. The most used surgical techniques for this disease excision and primary closure, Excision with healing by secondary intention (Lay opening of tract), Drainage with or without excision, Marsupialization. However, the recurrence rate or developing an infection of the wound after the operation is high. To prevent the recurrence rate and Chronicity various other techniques are brought into action. They are Karydaki's flap, Bascom procedure and other procedures like Z plasty, V-Y fascio-cutaneous advancement flap, Crossed Triangular Flap, Rhomboid flap of Limberg's. Limberg's flap reconstruction procedure is a feasible procedure for the patients of Pilonidal sinus. This technique is performed in recurrent and complex PNS disease. Limberg flap reconstruction surgery have low recurrence rate and low complication rate and fast recovery. This is case study of 25 years old male patient complain of Intermittent pain with swelling in Sacro-coccygeal region- 7 month and Blood stain pus discharge from lesion in Sacro-coccygeal area-4 month. Patient not given any previous history of surgical intervention. This patient was operated by Limberg's flap /Rhomboid flap reconstructive procedure. Patient wound was healed primarily with minimal scarring and less postoperative pain, no flap necrosis, no seroma formation with no recurrence till the six months.

**Keywords:** *Kshar-Sutra* therapy, Limberg's flap/Rhomboid, Sacrococcygeal pilonidal sinus.

### INTRODUCTION

Pilonidal sinus is common disease and is usually found in the midline of the sacrococcygeal region of young hirsute men. It is an acquired condition with high morbidity and patient discomfort. The name pi-

lonidal is taken from Latin meaning “nest of hairs.” The estimated incidence is 26 per 1, 00,000 population.<sup>1,2</sup> It generally presents as a cyst, abscess or sinus tracts with or without discharge.<sup>3</sup> Men affected more often than women, rare both before puberty and after the age of 40 years.<sup>4</sup>The etiology of the pilonidal sinus is a matter of debate. Initially congenital origin was suggested that it was secondary to a remnant of an epithelial lined tract from post coccygeal epidermal cell rests or vestigial scent cells. Now the view widely shifted toward acquired theory<sup>5</sup> and is based on the observations that congenital tracts do not contain hair and are lined by cuboidal epithelium. Karydakis proposed three main factors causing the disease, namely high quantity of hair, extreme force, and vulnerability to infection.<sup>6</sup> The presence of hair in the gluteal cleft seems to play a significant role in the pathogenesis of this disease. A deep natal cleft is a favorable environment for sweating, maceration, bacterial contamination and penetration of hairs. Other risk factors include obesity, local trauma or irritation, sedentary lifestyle, family history, poor hygiene and excessive hairiness. It is widely accepted that a pilonidal sinus results from the penetration of shed hair shafts through the skin, which ultimately leads to an acute or chronic infected site, and the disease can be treated effectively by appropriate surgery.<sup>7</sup> However, extensive disease with numerous pilonidal openings, branching tracts, and overt symptoms may require wide excision of the diseased region. 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. Although pilonidal sinus can be treated using several defined conservative and surgical methods, recurrence rates remain high.<sup>8</sup> Complete removal of the pilonidal sinus or sinuses and appropriate reconstruction can lead to successful recovery.<sup>9</sup>

The Various techniques for management of sacrococcygeal pilonidal sinus have been described which ranges from, clipping of hairs with good hygiene of the area, simplest is incision and drainage, laying open, excision and primary closure, wide excision of the area and packing, marsupialization and flap tech-

niques like Limberg flap.<sup>10</sup>The more complex ones include Bascom's, Kardaykis and a rhomboid excision with Limberg flap. *Aacharya Sushruta* has described a minimally invasive Para-surgical procedure *Kshar-Sutra* procedure for *Nadivrana*.<sup>11</sup>*Sushruta* has also advocated *Chedan Karma* (excision of PNS tract). This procedure is good, safe, less expensive, very less or no recurrence rate, less discomfort but prolonged recovery time and changing of *Kshar Sutra* in every seven day. Limberg procedure is a safe and reliable technique in the treatment of sacrococcygeal pilonidal sinus disease, with low complication and recurrence rates. Different surgical modalities for treatment of sacrococcygeal pilonidal sinus, flap reconstruction techniques eradicate the etiology of the disease by flattening the inter gluteal sulcus with much less hairy fascio-cutaneous flaps and less perspiration.<sup>12</sup> Among them, the most commonly used is the rhomboid excision with the Limberg flap. With this technique of flattening the natal cleft, a tension-free repair is made using a wide, well-vascularized flap. This paper contains a case report of Sacro-coccygeal Pilonidal sinus as follow-

**CASE REPORT-** A male patient 25 year of age, came to OPD of *Shalya Tantra* Institute of Medical Sciences Banaras Hindu University, Varanasi (UP) presented with chief complains Intermittent pain with swelling in Sacro-coccygeal region- 7 month and Blood stain pus discharge from lesion in Sacro-coccygeal area – 4 month.

**PRESENT HISTORY-** Patient is Asymptomatic before 7 months then he was noticed Painful swelling in midline of natal cleft region which gradually increase in size, Spontaneous burst out and blood stain pus discharge through another secondary opening in Sacro-coccygeal region. Then he was consult to local Ayurveda doctor and took some medication, but doctor advised to operation by *Ksharsutra therapy*, but patient refused for *Ksharsutra* operation due to prolonged recovery time. After that patient came to OPD, department of *Shalya Tantra*, IMS-BHU for better treatment.

**PAST HISTORY-** Patient is not given any history of hypertension/diabetes mellitus/ tuberculosis/bronchial

asthma/epilepsy/ drug allergy/other systemic disease. He had also not given any previous operative surgery / No any traumatic accidental history.

**FAMILY HISTORY** –All family members are alive and healthy, no any relevant family history found.

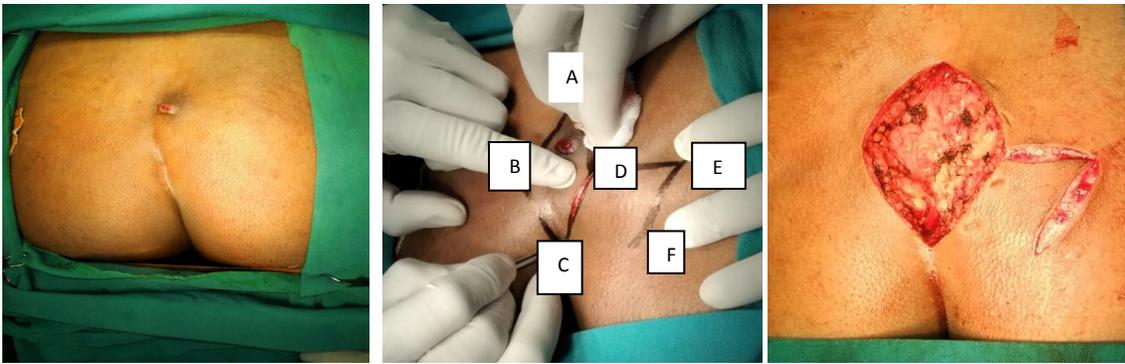
**PERSONAL HISTORY** –Diet-Mixed diet (vegetarian & non veg.), Appetite-Good Bowel-Regular (normal), Maturation-5-6 times per day/ 2-3 times per night, Sleep-6-8 hour in 24 hours, Addiction-Not any General examination - General condition – fair, Weight - 61kg, Blood pressure- 124/80mmHg, Pulse rate- 80/min Respiration rate -16/min, Temperature-98.6 F. Physical examination- Pallor –absent, Icterus-absent, Cyanosis-absent, Clubbing-absent, Edema-absent, Regional lymph node- not palpable. Systemic examination- Central nervous system- patient was conscious and well oriented to time, place and person. Cardiovascular system- No cardiac murmur heard, S1S2 sound normal heard. Respiratory system- trachea is centrally placed, bilateral equal air entry normal, bilateral chest expansion normal, Bronco-vesicular sound normal. Per abdomen -Inspection-Abdomen skin normal, Umbilicus centrally placed and inverted, No any scar mark present on abdomen, No visible vein, No abdomen distention. Palpation-Abdomen soft and non-tender, No palpable swelling/mass, No palpable Organomegaly. Auscultation–Bowel sound heard normal pattern. Percussion- No shifting dullness, Fluid thrills absent. Genito- urinary system:- penile and scrotum skin normal ,External meatus opening normal ,No sign of inflammation seen, No Swelling present in scrotum, No palpable any indurated swelling in inguino-scrotal region. Per-Rectal examination- Perianal skin –normal, No external opening present in perianal region, Sphincter tone –normal, No internal opening present, No communication of pilonidal sinus tract with anal canal.

**LOCAL EXAMINATION-** Sacro-coccygeal area skin normal, Presence of small pit in midline of natal cleft, Another secondary opening present in Right lateral side and superior to the midline of natal cleft, Blood stained discharge present from secondary opening , No any local redness and tenderness present, No fluctuant mass or no induration present.

**LAB INVESTIGATION: Hb-15.3gm/dl, TLC- $6.9 \times 10^3/\mu\text{l}$ , DLC-N<sub>48.6</sub>,L<sub>40.7</sub>,M<sub>6.1</sub>,E<sub>4.5</sub>,B<sub>0.1</sub>,Platelet- $183 \times 10^3/\mu\text{l}$ , SGPT/SGOT/ALP/T.BIL/D.BIL-27.2 (IU/L)/24.8(IU/L)/188(IU/L)/0.7(mg/dl)/0.4(mg/dl), Total protein/Albumin–7.2gm/dl/3.2gm/dl, Na/K/Cl/urea/creatinine-133.2mmol/L/4.7mmol/L/99.4mmol/L/27.5mg/dl/0.7 mg/dl, RBS-103.2 (mg/dl), HIV – Negative, HBsAg & Anti HCV –Non-reactive.**

#### **SURGICAL PROCEDURE -**

Operation was performed under spinal anesthesia. Patient was placed in prone position and the buttocks strapped apart by adhesive tapes. After adequate shaving and skin preparation over sacro-coccygeal area before operation. Using a sterile skin-marking pen a rhomboid area of skin was marked over pilonidal sinus involving all midline pits and lateral extension. The flap design was mapped on the skin. The long axis of the rhomboid in midline was 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 transected the midpoint of A-C at right angles and is 60 % of its length. D-E was a direct continuation of the line B-D and was of equal length to the incision B-A, to which it was sutured after rotation. E-F was parallel to D-C and of equal length. After rotation, it was sutured to A-D.<sup>13</sup>The rhomboid shaped excision including the sinus and its extensions is made down to the pre-sacral fascia. Flap is constructed by extending the incision laterally and down to the fascia of the gluteus maximus muscle. The diseased area is removed. Flap should be exactly of the same angles and length of the defect made by the excision. Thus, a rhombic shaped fascio-cutaneous flap is developed. The flap is transposed into the rhombic defect without tension. Suction drain is placed in the wound cavity, through a separate stab incision. Subcutaneous tissue is approximated with interrupted 2-0 vicryl absorbable suture. Skin is closed with mattress interrupted suture with trulone 3-0 non absorbable suture.



Preoperative- Pilonidal Sinus

Marking of rhomboid flap

Excision of Pilonidal sinus tract



Raising of Limberg flap

Complete excision of tract with elevation of flap

Placement of suction drain



Rotation and fixation of flap over defect

After suturing complete closure

3<sup>rd</sup> day—dressing changed



On 9<sup>th</sup> day- Alternate stitches removed

on 10<sup>th</sup> day- All stitches removed

## OBSERVATION & RESULTS

After Careful examination and clinical findings diagnosed as Pilonidal sinus patient admitted in *Sushruta* (Surgical) ward of SSH, IMS-BHU hospital. At the outset relevant routine blood examination with viral marker were done before operation. A thorough counseling was done regarding severity of disease and future complications of pilonidal sinus. After consent of patient, the Pilonidal sinus was operated under Spinal anesthesia Limberg flap reconstruction surgery. The operation produces a tension-free flap of unscarred skin in the midline. Antibiotics were given for 7 days initially intravenously, then orally for prevention for site of infection. Suction drain removed after 3 days; stitches removed on 10th day. The patient was observed no complications like seroma formation, haematoma formation, edema, flap necrosis, Surgical site wound infection, postoperative pain. Patient was advised not to put pressure on the flap for 3 weeks and advised return to normal activities after removal of stitches after 10 days, but to avoid excessive physical strain and strenuous sports for following 3 to 4 weeks. Follow up of patient was performed on outpatient basis, initially after 15 day then every month for six months.

## DISCUSSION

Sacrococcygeal pilonidal disease occurs in the midline. Increased depth of the intergluteal sulcus leads to an anaerobic media and increased anaerobic bacterial content.<sup>14,15</sup> Also, the vacuum effect created between heavy buttocks is thought to play an additional role in pilonidal disease development. The vacuum effect sucks the anaerobic bacteria, hair, and debris into the subcutaneous fat tissue. If these factors responsible for the development of the disease are not eliminated, they will play a major role in the development of disease recurrence as well.<sup>16,17</sup> Although many surgical and nonsurgical treatment methods have been described, the ideal treatment method has not yet been established for pilonidal sinus disease. Complete excision of the sinus is widely practiced, but controversy remains about what to do with the wound after excision.<sup>18</sup> Excision and packing, excision and primary

closure, Marsupialization, and flap techniques are surgical procedures that have been developed for treatment of pilonidal sinus. The problems related to a continuing natal cleft after pilonidal sinus surgery has prompted surgeons to discover techniques to eliminate the gluteal furrow. Bascom hypothesized that infection starts in the hair follicles, which have open orifices that initiate the development of infection and sinus. He recommended excision of the midline pits with lateral open drainage of any associated abscess.<sup>19</sup> Karydakos used an asymmetric excision and primary closure to prevent hair penetration into the natal cleft.<sup>20,21</sup> With this technique, the natal cleft is flattened, and the incisional line and scar are transferred laterally from the midline. To eliminate natal cleft and wound tension, various plastic reconstructive techniques such as Z-plasty, W-plasty, V-Y plasty and various flap techniques have been used.<sup>22</sup> Flap techniques have been associated with lower infection and recurrence rates, shorter hospital stays, and better results. With this technique, the internal cleft can be flattened, and tissue can be approximated without tension. The importance of the post-operative wound care should also be stressed. Exercise or sitting down on the wound should be avoided for two weeks and the patient must return slowly to normal activities. Hair removal either by shaving the edges of the wound is mandatory.

## CONCLUSION

Limberg flap for reconstruction of the defect after excision of sacrococcygeal pilonidal sinus is an effective and reliable technique, easily performed, high patient satisfaction, low complication rate, short hospitalization, low recurrence rates, earlier healing and shorter time off-work, recovery fast, recovery time very short compare to *Ksharsutra* therapy.

The advantages of Limberg flap reconstruction are:

- Flattens the natal cleft with a large well-vascularized flap that can be sutured without tension.
- Midline dead space and scar is avoided.
- Useful in complex sinuses with multiple pits.
- Easy to perform, learn and design.
- Useful in recurrent pilonidal disease.

- Reduces hospital stay and time to resume normal activities.

## REFERENCES

1. Humphries AE, James E. Evaluation and management of pilonidal disease. *Surg Clin North Am.* 2010;90(1):113-24.
2. Sondana K, Andersen E. Patient characteristics and symptoms of in chronic pilonidal sinus disease. *Int J Colorectal Dis.* 1995;10(1):39-42.
3. Hull TL, Wu J. Pilonidal disease. *Surg Clin North Am.* 2002; 82:1169-85.
4. Clothier PR, Haywood IR. The natural history of the post anal pilonidal sinus. *Ann R College Surg England.* 61984;6(3):201-3.
5. Brearley R. Pilonidal sinus: a new theory of origin. *Br J Surg.* 1955; 43:62-8.
6. Karydakis GE. Easy and successful treatment of pilonidal sinus after explanation of its causative process. *Aust NZJ Surg.* 1992; 62: 385-9.
7. Surrell JA. Pilonidal disease. *Surg Clin North Am.* 1994; 74:1309-15.
8. Urhan MK, Kucukel F, Topgul K, Ozer I, Sari S. Rhomboid excision and Limberg flap for managing pilonidal sinus: results of 102 cases. *Dis Colon Rectum.* 2002;45(5):656-9.
9. Yildiz MK, Ozkan E, Odaba M, Kaya B, Eris C, Abuoglu HH, et al. Karydakis flap procedure in patients with sacrococcygeal pilonidal sinus disease: experience of a single centre in Istanbul. *Scientific World J.* 2013.
10. Eryilmaz R, Sahin M, Alimoglu O, Dasiran F. Surgical treatment of sacrococcygeal pilonidal sinus with the limberg transposition flap. *Surg.* 2003;134(5):745-9.
11. Sushruta Samhita edited with Ayurveda TatvaSandipika Hindi Commentary by Ambikadutta Shastri, Choukambha Sanskrita, Varanasi vol-1 Nidan Sthan 10/9-14 and Sushruta Chikitsa Sthan17/29-32
12. Khatri VP, Espinosa MH, Amin AK. Management of recurrent pilonidal sinus by simple V-Y fasciocutaneous flap. *Dis Colon Rectum.* 1994; 37:1232e-5.
13. Farquharson EL, Rintoul RF. Farquharson's textbook of operative general surgery. 9th edn. Hodder Arnold publication; London: 2005:457-458.
14. Marks J, Harding KG, Hughes LE, et al. Pilonidal sinus excision – healing by open granulation. *Br J Surg* 1985; 72:637–40.
15. Miocinovic M, Horzic M, Bunoza D. The prevalence of anaerobic infection in pilonidal sinus of the sacro-coccygeal region and its effect on the complications. *Acta Med* 2001; 55:87–90.
16. Akinci OF, Bozer M, Uzunkoy A, et al. Incidence and etiological factors in pilonidal sinus among Turkish soldiers. *Eur J Surg* 1999; 165:339–42.
17. Karydakis GE. The etiology of pilonidal sinus. *Hellenic Armed Forces Med Rev* 1975; 7:411–6.
18. Corman ML. Colon and rectal surgery. 2nd ed. Philadelphia: Lippincott, 1989:297–304.
19. Bascom J. Pilonidal disease: origin from follicles of hairs and results of follicle removal as treatment. *Surgery* 1980; 87:567–72.
20. Karydakis GE. Easy and successful treatment of pilonidal sinus after explanation of its causative process. *ANZ J Surg* 1992; 62:385–9.
21. Kitchen PR. Pilonidal sinus: experience with the Karydakis flap. *Br J Surg* 1996; 83:1452–5.
22. Nessar G, Kayaalp C, Seven C. Elliptical rotation flap for pilonidal sinus. *Am J Surg* 2004; 187:300–3.

**Source of Support: Nil**

**Conflict of Interest: None Declared**

How to cite this URL: Vinod Kumar & Lakshman Singh: Limberg's Flap /Rhomboid Flap Reconstruction Procedure For Sacro-Coccygeal Pilonidal Sinus- (A Single Case Study). *International Ayurvedic Medical Journal* {online} 2020 {cited April, 2020} Available from: [http://www.iamj.in/posts/images/upload/3428\\_3433.pdf](http://www.iamj.in/posts/images/upload/3428_3433.pdf)