

Original Research Article

Lateral advancement flap for sacrococcygeal pilonidal sinus: reassessment study

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ABSTRACT

Background: Sacrococcygeal pilonidal sinus disease is treated better with various flaps and primary closure. This study was aimed to describe the lateral advancement flap in surgical treatment of sacrococcygeal pilonidal sinus disease in an effort to redefine the results of this technique. It is a fascio-adipo-cutaneous flap which is advanced from one buttock to opposite across the natal cleft and providing the off midline closure with cleft lift.

Methods: The results of this technique were assessed in 65 patients. The technique consists of adequate excisions of sinus, tracts and surrounding inflamed tissue till depth of presacral fascia. The defect was covered with a thick lateral advancement flap and produce an off midline closure and cleft lift.

Results: The sixty patients were hirsute males and five were hairless females. The maximum length and breadth covered was 7x5cm. The operative time taken was 40±10 minutes. The average hospital stay was 5 to 7 days. The surgical site infection in 4 patients and wound dehiscence occurred in one patient only. No recurrence was recorded in follow up period of one year.

Conclusions: The lateral fascio-cutaneous advancement flap is gaining popularity for its ease of designing and harvesting. The short hospital stay, minimum postoperative complications, no recurrence and acceptable aesthetic results make this a uniformly acceptable technique for surgical primary closure of pilonidal sinus disease.

Keywords: Burow's triangle, Lateral advancement flap, Natal Cleft, Pilonidal sinus disease, Surgical treatment

INTRODUCTION

The word pilonidal is derived from latin which means nests of hairs. The first description of pilonidal sinus was given by Hodges in 1880.¹ The pilonidal sinus is a disease of natal cleft with a tract lined by epithelial cells mostly containing tuft of hairs situated in the sacrococcygeal region. The disease commonly affects hirsute men in second and third decade. Males are affected 10 times more than females.² Obesity, drivers, sedentary occupation, sweating and trauma are the risk factors for development of pilonidal sinus disease.² Clinically pilonidal sinus can present as acute abscess or

chronic discharging sinus. Acute abscess should be drained and allowed to form a pus discharging sinus. Chronic pilonidal sinus disease should only be subjected to surgery. Many surgical treatment options are available for pilonidal sinus disease like excision, excision with VAC (vacuum assisted closure) midline closure, marsupialisation, off the midline closure using various types of flaps.³ All these methods have complications, postoperative infection and recurrence. Although no procedure has been uniformly accepted but surgical procedures with obliteration natal cleft and eccentric closure are gaining popularity because of minimum recurrence rate.⁴ The Bascom procedure, Limberg

transposition flap, Modified Limberg flap, Karydakís procedure and various modifications of Karydakís procedure are the surgical options for treatment of pilonidal sinus disease.^{5,6} Other plastic surgery flaps like rotation flap, V-Y advancement flap, Z-plasty, lateral advancement flap are more commonly used flaps these days.^{7,8} These flaps are based on principles of excision, eccentric primary closure and obliteration of natal cleft in sacrococcygeal region. Enblock excision of pilonidal sinus up to sacral fascia and eccentric closure using a bulky adipo-fascio-cutaneous flap has gained popularity because of good results. This flap has been projected as future flap for radical treatment of pilonidal sinus disease because of low rate of complications and recurrence. this prospective study was carried out as a revisit to evaluate the effectiveness of lateral advancement flap with Burow's triangles in surgical treatment of pilonidal sinus disease in present scenario.

METHODS

This study was conducted on 65 consecutive patients suffering from pilonidal sinus disease. All the patients with clinical diagnosis of pilonidal sinus in sacrococcygeal natal cleft and admitted for surgical treatment were included in this study. A detailed history and clinical examination was recorded in reference to duration, single or multiple, distance of induration from sinus opening and density of hairs in back and buttocks. In each case the differential diagnosis of folliculitis, hydradenitis suppurativa, traumatic ulcer and sinus due to post anal dermoid must be considered.

Haematological investigation and pre anaesthetic check up was done prior to admission. Informed consent was taken from each patient. Institutional ethical committee consent was obtained. After preoperative preparation the patients were operated under general or spinal anaesthesia. The patients were operated in prone position with buttocks pulled apart using an adhesive tape to widen the natal cleft to facilitate designing and harvesting of flap (Figure 1).



Figure 1: Pilonidal sinus.

After cleaning and draping the area, a rectangular area is marked including the pilonidal sinus, its tract and induration. This rectangular area is excised en bloc deep up to sacrococcygeal fascia. The excision is done straight in line of incision without any undermining (Figure 2).



Figure 2: Rectangular Area being excised.

Now the rectangular flap is outlined either on right or left buttock as rectangle. The breadth of this flap is equal to length of rectangular defect and length is twice the breadth of rectangular defect to avoid tension on the flap after covering the defect. It is an adipo-fascio-cutaneous flap which is raised in this outlined area. The flap is raised in the subfascial plane separating fascia from gluteus maximus muscle by electrocautery achieving the haemostasis simultaneously (Figure 3).



Figure 3: Lateral advancement flap planned.

To avoid dog ear deformity at the base of flap on both sides, a Burow's triangle is made on each side. The dissected area is washed with warm normal saline solution. A negative suction drain is inserted under the flap. The fascia of the flap is stitched to the surrounding fascia by interrupted sutures using 2-0 polygalactyl thread with round body needle (Figure 4). The skin is

closed by interrupted sutures using 3-0 polypropylene thread (Figure 5).



Figure 4: Closure of fascia.

This is off midline closure produces a scar at least 2cm away from the natal cleft. Limited mobility is allowed on the first postoperative day. Semisolid diet is given in beginning for five days followed by full meals. Patient is asked not to defecate in squatting posture. When the drain fluid in drainage tube decreases the drain is removed. The observations were made regarding operative time, haematoma or seroma formation, wound infection and hospital stay. Follow up of these patients was every week in outdoor patient department for recurrence, patient satisfaction, quality of life and return to work. Specific inspection of the operated site was done to detect any evidence of recurrence especially at the lower margin of the advanced flap crossing the midline natal cleft.



Figure 5: Off midline closure of lateral advancement flap with Burow's triangles.

RESULTS

The sixty five patients included in this study were operated by same technique and one surgeon. The age group of these patient was between 20 years to 45 years predominantly males with dense hirsute. Out of 65

patients, 60 were males and 5 were females. These patients were well built with heavy buttocks making the natal cleft deep. Sixty patients included in this study had one sinus tract, four patients had multiple tracts, one patient had recurrent single sinus tract. After excision of pilonidal sinus and indurated area the length and breadth of the defect was measured. The length of defect was 5 to 7 cm and breadth was 3 to 5 cm. So the maximum length of the lateral advancement flap was 10 cm. The operative time for this surgical procedure was 40 ± 10 minutes. The average hospital stay was 5 days extending up to 7 days in two patients. The surgical site infection was the commonest complication occurred in 4 patients, the commonest site of infection being union of flap with natal cleft just posterior to anus. This was also the site for partial wound dehiscence in one patient.

The serosanguinous discharge in negative suction drain was decreasing in volume for 72 hours and drain was removed when drainage fluid reduced in quantity. One patient had prolonged drainage and drain was removed on 5th postoperative day. One patient developed seroma due to blockage of drain by blood clot. This patient had partial dehiscence of wound. None of the patient had haematoma formation. The margin necrosis was seen in two patients with in stitch line. The total healing time was 10 to 14 days. In patients with infection and partial dehiscence the healing time was further extended by a week. The Burow's triangles made on each side at the base of flap to correct the dog ear deformity; finally produces a good cosmetic result after stitching. The follow up was done on weekly basis for 4 weeks. The final follow up was done for one year. Four patients had scar hypertrophy, recurrence was not seen in any of these patients. The answer to questions regarding cosmesis and quality of life were affirmative. The patient satisfaction to this surgical procedure was very good.

DISCUSSION

Nonsurgical methods for treatment of pilonidal sinus are of not much avail. Surgical treatment of pilonidal sinus is considered best. The conventional treatment consists of excision and healing by secondary intention.⁹ Aydede et al designed a study to compare three methods namely marsupialisation, primary midline closure and skin flaps. No difference in wound infection and recurrence rates was observed between three methods and emphasized that these methods are still useful.¹⁰

Surgical procedures for pilonidal sinus disease which use asymmetric technique producing offline scar can provide better results than simple excision producing midline scar. Bascom procedure made a lateral incision combined with excision of any midline pits to incise, drain and curette the pilonidal sinus disease.¹¹ Rushfeldt et al conducted a study on pilonidal sinus surgical treatment using Bascom asymmetric cleft lift procedure on day care basis. Because of the promising early results, they concluded that Bascom procedure can be the standard

procedure for chronic pilonidal sinus disease.¹² In this debate of primary closure of defect after surgical excision whether midline or off midline closure, Nessar et al advised extensive excision of the pilonidal disease up to sacral fascia and closed these defects off midline using an elliptical cutaneous rotation flap. These patients were discharged on first postoperative day. Wound healing was by primary intention in all these patients within two weeks. Recurrence was not observed in any patient in a short follow up.¹³

The Limberg flap or rhomboid flap is a random flap that can be raised from any corner of the rhomboid and can be used to close the defect. This flap is used in covering the defects after pilonidal sinus excision. The defect should be filled with tissue of the same thickness.¹⁴ Karydakos was the pioneer to describe the principle to reshape and flatten the natal cleft in surgical treatment of pilonidal disease.

In Karydakos procedure an elliptical flap is raised which overlaps the midline, fixation of the base of flap to sacrococcygeal fascia and stitched on one side of the natal cleft. This obliteration of natal cleft reduces moisture, friction, hair accumulation and thus reducing drilling by hairs in natal cleft.¹⁵ Bessa modified the original Karydakos technique with aim of flattening the natal cleft by not fixing the base of the flap to sacrococcygeal fascia. In a study of 82 patients operated by lateral advancing flap operation (modified Karydakos procedure), these patients had a very short stay of two days, short healing period, good patient satisfaction and no recurrence making the lateral advancement flap a viable option in surgical treatment of pilonidal sinus.¹⁶ Orhalmi et al in searching the possible surgical treatment for pilonidal sinus concluded that Limberg flap and Karydakos procedure are relatively easy to perform. Both procedures lead to better results in pilonidal sinus in reference of recurrence rates and overall morbidity.¹⁷

Saydam et al in a comparative study of lateral advancement transposition flap with Burow's triangle and modified Limberg transposition flap observed that these two methods were equivocal statistically in all parameters like operative time, hospital stay and postoperative complications. They concluded that lateral advancement flap is a viable option for surgical treatment of pilonidal sinus disease as compared to more preferable options like modified Limberg flap.¹⁸ Yuksel et al described a new bilateral parallel elliptic fascio-cutaneous advancement flap technique in pilonidal sinus disease. This procedure included a bilateral parallel elliptical excision and mobilization of fascio-cutaneous from one side of the wound. The base of this flap is fixed to sacrococcygeal fascia and suturing its edge to other side of the wound. The wound is closed in layers without tension. Patients operated with this technique had minimum postoperative morbidity, short hospital stay and reduced recurrence rate.¹⁹

In our study the technique pioneered by Singh RB has been followed. In a retrospective study he used various adipo-fascio-cutaneous flaps for reconstruction of the defect created by wide excision of the pilonidal sinus. The surgical principle of partial obliteration of natal cleft and primary eccentric closure was followed. Excellent results were achieved as none of the patients was reported to have collection, haematoma, infection and recurrence. They inferred that lateral advancement flap is a viable option in pilonidal sinus treatment as it ensures reliable wound healing, minimum morbidity, short hospital stay, early resumption of work and good cosmesis.²⁰

Dalal et al in a follow-on study evaluated the effectiveness of lateral advancement flap with Burow's triangle in 29 patients of pilonidal sinus disease. They inferred that this technique is very simple, reliable easy to learn and effective technique producing results with good cosmesis, early return to work and no recurrence.²¹ It is obvious from the above discussion that multiple techniques and studies are available for surgical treatment of pilonidal disease. Even comparative studies are inconclusive in interpretation that which technique is uniformly good. The modifications of these techniques particularly Limberg flap and Karydakos flap have been devised. The search for an ideal flap is still on. Most of techniques claim to be a novel technique with very good results and minimum recurrence rate. Lateral advancement flap with Burow's triangle has been revisited with another study of 65 patients with pilonidal sinus disease in sacrococcygeal natal cleft. These patients were predominantly young hirsute males. The adequate excision of pilonidal disease including sinus, tracts and all inflammatory tissue and depth up to sacrococcygeal fascia created large defects to the size of 7x5x4 cm.

The depth of the defect is variable depending on the thickness of buttocks. Such large defects can be filled with this bulky lateral advancement flap which is fascio-adipo-cutaneous flap. The bulk was adequate to produce obliteration of natal cleft and cleft lift. The operative time of 40±10 minutes is comparable to other studies. The mean hospital stay of 5 days is short in comparison of other studies. This study can be performed as day surgery discharging the patient within 23 hours if patient is discharged with negative suction drain. The incidence of complications like infection, seroma formation and wound dehiscence is far less than other studies.²¹ Marginal necrosis can be attributed to use of electrocautery for dissection of flap. The wound healing time is at par with other studies. No recurrence is recorded in this study and previous studies. The good cosmetic result, patient satisfaction, no recurrence, no postoperative morbidity, early return to work and good quality of life makes it ideal flap for primary closure of the widely excised sacrococcygeal pilonidal sinus disease.

CONCLUSION

The lateral fascio-cutaneous advancement flap is a novel technique for surgical treatment of pilonidal sinus disease. This flap fulfils the basic criteria of adequate excision of inflamed tissue, a bulky fascio-adipo-cutaneous flap to fill the defect without leaving dead space, off the midline closure with obliteration of the natal cleft in sacrococcygeal area and producing healing by primary intention. This flap is gaining popularity for its ease of flap preparation. The short hospital stay, minimum postoperative complications, no recurrence and acceptable aesthetic results makes this a uniformly acceptable technique for pilonidal sinus surgery.

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