Excision and primary closure versus an island flap for management of extensive pilonidal sinus disease

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Abstract

Hypothesis: Pilonidal sinus is a common chronic disorder affecting the sacrococcygeal area in young patients. Controversy still exists about the best surgical technique for treatment of pilonidal sinus disease. The aim of this study is to seek for the preferred option for management of pilonidal sinus disease regarding recurrence rate and post- operative scar.

Design: case series.

Setting: This study was conducted in the General Surgery Department, Faculty of Medicine, Zagazig University, from November 2006 to June 2008.

Patients: Thirty two patients (20 men and 12 women; 11/5and 9/7) with a median age of 25 and 23 years (range 19-33 years). They are divided in two groups; each contains 16 patients.

Intervention: The patients were treated by eccentric elliptical excision of the diseased tissues down to the sacral fascia and closure of the defect with either island flap in 16 patients group A or primary closure in 16 patients group B, after placing a closed suction drain at the base of the wound, then suturing the flaps with loose Vicryl® 2/0 sutures. The follow-up period ranged from 14 to 32 months (mean, 24 months).

Main outcome measure: Length of hospital stay and return to normal activities, early wound complications, and recurrence.

Results: The mean hospital stay was 16.6 hours in group A (island flap) versus 22 .2 hours in group B (primary closure). Wounds healing time was 13 days in group A versus 35 days in group B. Superficial wound infection occured in one patients in group A versus three in group B. Superficial gangrene of wound edges occured in one patient and partial wound breakdown in one patient in group A. Two patients in group B had recurrence. The patients returned to work after 12.3 days in group A and 18.8 days in group B.

Conclusion: An island flap is an easy and acceptable method with superior cosmetic scar effect and patients' satisfaction in comparison with the primary excision and closure for management of extensive pilonidal disease.

Key words: Pilonidal, island flap, primary closure.

Introduction:

Sacrococcygeal pilonidal sinus disease (PSD) is a common disorder mainly in young hirsute men. Herbert Mayo is reported to have published the first case of PSD in1833[1] and many surgical techniques have been described and performed since the 1880s as treatment for chronic PSD.[1,2]

Although PD is quite common, controversy still exists about its treatment. While all treatment options are available, the consensus is that an ideal therapy should be simple, with minimal pain, a short hospital stay, a quick return to normal activity, and a low recurrence rate.[2] Many different approaches have been put ranging from a conservation treatment to an extensive surgical excision for pilonidal diseases. However, none proved successful in eliminating the complications attendant to such procedures like delayed wound healing,

infection and the rate of recurrence. Radical excision is one such procedure, wherein the sinus tracts are excised along the surrounding tissue up to the pre-sacral fascia.[3]

The debate, however, revolves round the mode of manner of reconstruction of the large wound left behind after the procedure. It is often left alone to heal by granulation, which takes a long time and needs regular dressing and meticulous wound care. Excision with primary closure obviates a large wound but in the process, the chances of wound infection; wound dehiscence and recurrence are very high.[4] Techniques involving closure by Z-plasty, rhomboid or myocutaneous advancement flaps require long operative time and hospital stay and are fraught with complications like loss of the graft or flap.[2,4]

Lord and Miller described a "closed" technique that included the removal of the midline sinuses and lateral tracts. It is simple to perform and the complication and recurrence rates are within acceptable limits.[4,5] Open excision technique needs long hospitalization and wound dressing daily. Wound breakdown is also another disadvantage caused by premature closure of the skin edges before complete wound healing. Excision of the diseased tissue down to the post-sacral fascia is generally accepted but the management of the remaining defect is still a matter of debate.[6]

The aim of this study is to compare a simple operative procedure versus more complex flap closure (island flap) regarding the recurrence rate and patients' satisfaction about postoperative pain and cosmetic appearance of the scar.

Methods:

A prospective study was done in General Surgery Department, Zagazig University which included thirty two patients divided into two groups; group A included 16 patients operated on by an island flap and 16 patients in group B operated on by an eccentric excision and primary closure during the period from November 2006 to June 2009. All patients had extensive pilonidal sinus either primary or recurrent after a failed surgical procedure as recorded in **Table(1)**.

All patients were admitted to hospital same day of surgery and were operated on under general or spinal anaesthesia. The natal cleft was shaved the day before surgery.

The patients were placed in prone jack-knife position on the operating table with the legs slightly abducted and the buttocks strapped apart by adhesive tapes on the table.

Figure (1): Recurrent pilonidal sinus after 1ry excision and primary closure.

Figure (2): Complete excision of pilonidal sinus down to presacral fascia.

Figure (3): Island flap was dissected from its original site.

Figure (4): Island flap was rotated to fill the excised space.

Figure (5): Early post-operative with stitches in place.

Figure (6): Late post-operative after 20 month.

The surgical procedure comprised a vertical elliptical excision of all diseased tissue down to the pre-sacral fascia and methylene blue injection before excision to delinate all diseased tissues. Care was taken to handle tissues as gently as possible, and meticulous homeostasis was accomplished. An island flap was marked over the gluteus muscle fascia after marking the perforating vessel **Figures(3,4)**. The flap was then rotated and advanced and sutured subcutaneously with 2/0 polyglactin (Vicryl®) beginning from its lower edge. The stitches should be tension free to avoid cutting during shearing movement. The skin was sutured with vertical mattress stitch of 3-0 Prolene®. The flap donor area was sutured primarily with the same material in similar fashion **Figure(5)**. Closed suction drains were placed in the potential space in all patients and were removed after ten to fourteen days.

Wound inspection and dressing were done once after one week in both groups with removal of suction drain. The sutures were removed after ten days. The patients were instructed to have bed rest, away from work and recent follow-up was confirmed by clinical charts or phone interview.

Results:

Mean follow-up was 24 months (range 14-32 months). Mean operative time was 53.2 minutes (in group A) versus 33.4 (in group B; range 50-70 and 25-45 minutes). The mean hospital stay was 16.6 hours versus 22 .2 hours in both groups respectively.

Table (1): Preoperative patients' characters.

	Group A (Island flap)	Group B (Primary closure)	P value
Age (Mean /range) Sex M/F	23,1 (19-35) 11/5	19,1(20-33) 9/7	0.0361
Types of the sinuses Primary sinuses extensive Recurrent After primary excision After flap closure	 6 (37.2%) 4 (25%) 6 (37.2%)	 5 (31.2%) 7 (43.7%) 4 (25%)	0.2779

Table (2): Postoperative patients' characteristics.

	Group A (Island flap)	Group B (Primary closure)	P value
Operative time Mean /range (minutes)	53.2 / 50-70	33.4 / 25-45	0. 0020 s
Hospital stay Mean /Range	16.6 (6-24) hours	22.2 (24-28) hours	0.3378 ns
Postoperative morbidity Superficial wound infection Wound breakdown Edge gangrene	 1 (6.25%) 1 (6.25%) 1 (6.25%)	 3 (18.7%) 0 0	0.4805 ns
Healing time (days)	13 (11-23)	21 (17-37)	s
Work off time (days)	12.3 (11-21)	18.8 (13-39)	s
Recurrence	0	2 (12.5%)	ns

Table (3): Postoperative pain and patients' satisfaction.

	Group A (Island flap)	Group B (Open excision)	P value
Patients' satisfaction Fair Good Excellent	 2 (12.5%) 6 (38.5%) 8 (50%)	 10 (62.5%) 2 (12.5%) 4 (25%)	0.001
Cosmetic scar effects Ugly Good	 2 (12.5%) 14 (87.5%)	 10 (62.5%) 6 (38.5%)	0.011
Visual analogue scale < 3 3-6 > 6	 12 (74.5%) 2 (12.5%) 2 (12.5%)	 3 (19.3%) 10 (62.5%) 3 (19.3%)	0.122

P <0.05 significant

Postoperative morbidity involved superficial wound infection in one patients in group A versus three in group B respectively, superficial gangrene of wound edges in one patient and partial wound breakdown in one patient that settled with dressing in the out-patient clinic in group A. All wounds healed and the median healing time was 13 days in group A versus 21 days in group B (range11-23 and 17-37). Median time to return to normal activity was 12.3 days versus 18.8 days (rang 11-21, 11-39 days respectively). The postoperative cosmetic effect and patients satisfaction was superior in group A versus B with a significant difference. There was one case of recurrence in group B after one year follow up.

Discussion:

The natal cleft is situated in the deep intergluteal sulcus; the skin overlying it is hairy and closely attached to the underlying structures with little mobility. The chronic rolling movement and friction in the intergluteal area, together with the moist environment, contribute to chronicity and recurrence of the pathology affecting the region. In order to decrease the recurrence rate in patients with complicated disease, the natal cleft has to be widely excised. The technique used to reconstruct the defect should achieve a tension-free repair, avoid dead space, flatten the natal cleft and shift the scar away from the midline.[7,8]

Primary closure of the wound is a simple technique but it has a high recurrence rate due to continuing natal cleft. But Tritapepe and Padova[10] stated that excision and primary closure with a catheter at the bottom of the wound and the use of antiseptic/saline flushing are essential for primary intention healing and the avoidance of recurrences after 5 to 15 years follow up in 243 cases with chronic sinus irrespective of lifting the natal cleft.

Koshima et al, performed a cadaveric study of the perforators in the gluteal region.[11] They found 20-25 perforators, 3-8 cm long with diameters between 1 and 1.5 mm, supplying the area. These perforators originate from the superior gluteal, inferior gluteal, fourth lumbar, lateral sacral, and internal pudendal arteries. They then reported using a gluteal perforator-based flap to repair sacral pressure sores in eight patients. Other authors have also reported the use of perforator-based flaps for covering lumbosacral defects after the excision of pressure sores and tumors.[12]

In the present study we used this type of flap to transfer of large and well-vascularised tissue without sacrificing the underlying muscle, which may result in gait disturbance.

The flap described here is based on one of the parasacral perforators. This technique involves the transfer of well-vascularised tissue, with minimal donor-site morbidity, to reconstruct the natal cleft, obliterating the dead space, and facilitates a tension-free closure.

Regarding to the scars in this flap it is shifted away from the midline and the natal cleft is flattened, which both help to decrease the recurrence rate. No recurrence occurs in group A versus two patients (12.5%) in group B.

Bascom et al.[13] reported that the most common cause of failure of healing after surgery is the deep cleft, moist and rolling action of the buttocks. Flattening the natal cleft was proposed to prevent the macerating action induced by rolling the buttocks while walking thus our island flap to obliterate the defect had a high success rate in our results versus primary excision and closure.

In our study, the operating time is similar to other techniques for flap closure like Z shape and W shaped flap but the disadvantage of such procedures is part of the wound is in the midline which is the main cause of recurrence, besides; flap tip necrosis has been occurred.

The hospital stay is relatively short in group A versus that in group B. Comparison of our results regarding hospital stay, healing time, infection rate and recurrence is similar to those reported in the literature. Abo Galala et al,[1] compared the rhomboid flap and the deep suturing techniques and showed higher healing rates and lower recurrence rate for the former. Our rates of healing and superficial wound infections are comparable to their findings. There is a high recurrence rate in most published series irrespective of the procedure. Edwards[15] has reported a 46% recurrence rate for excision and healing by secondary intention and a 38% recurrence rate is quoted for excision and primary closure.

Another flap technique that avoids the midline wound is the advancement flap operation described by Karydakis.[16] After excision of the Pilonidal sinus, one of the wound edges is undermined and advanced against the other wound edge and sutured. Its recurrence rate is 1% to 4%, complication rate 8.5% to 9%, and the mean hospitalization stay is 3 to 4 days.

According to Bascom and Karydakis[14,16] techniques, excision of the diseased skin and subcutaneous tissue in a limited manner were done, and we preferred it for simple sinuses not extensive types or recurrent sinuses to avoid big excision that may lead to tension sutures and wound breakdown.

In our study only two patients had wound infection and partial breakdown, our results agree with that of bi-lobed rotations flap for wide excision of the midline natal cleft together with the whole diseased tissues and full coverage of the row area without tension sutures.[13-15]

The advantages of this island flap versus other pedicled flap is that it has no arc of rotation and allow us for wide excision of the diseased tissues without fear of tension sutures that may leads to wound breakdown during the shearing movement at the natal area. Thus we closed the defect, after wide excision of all diseased tissue down to the sacral fascia, with our island flap without any tension at the suture line and with no arc of rotation versus other types of flap.

Conclusion:

For many years, surgeons were trying many methods for treating pilonidal sinus. They were searching for simple, easy and effective method aiming at reducing hospital stay, minimizing tissue assault with little or no complications, allowing early resumption of work by the patient, and preventing recurrence of the disease. Surgical treatment of pilonidal sinus with island flaps seems to fulfill most of such parameters. Moreover it has the advantage of being tension free method.

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