Evaluation of comma-shaped incision with a sacral flap in surgical treatment of pilonidal sinus

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Background
Pilonidal sinus disease is an infection in the subcutaneous fatty tissue, mainly in the natal cleft. Although surgery is the best line of treatment with a favorable prognosis, recurrences and wound complications do occur in some cases. The aim of our study is to evaluate the coma-shaped incision with sacral flap for the management of chronic pilonidal sinus.

Patients and methods
Our study is prospective. All patients presented to the General Surgery Department, Assiut University Hospital by de novo chronic pilonidal sinus in the period from March 2017 to June 2018 were included in our study. Comma-shaped incision with sacral flap was planned to all patients. Data on patient demographics, operative time, blood loss, hospital stay, complications, and recurrence rate were evaluated.

Results
We included 30 patients. They comprised 22 men and eight women with a mean age of 34 years. The mean operative time and hospital stay were 27 min and 1 day, respectively. Two (6.6%) patients developed superficial wound infection and two (6.6%) patients developed seroma and one (3.3%) patient developed recurrence.

Conclusion
Comma-shaped incision with sacral flap provides good results and low recurrence rate. Further prospective studies of a larger number of patients are needed.

Keywords:
pilonidal sinus disease, recurrence, surgical flaps

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Introduction

Pilonidal sinus disease (PSD) is a common disease, with an incidence of 26 cases per 100 000 patients occurring annually [1]. Young, hirsute men are typically affected by this condition. Although it was thought that it is congenital, now it has become widely accepted that the condition is acquired [2]. Etiology of this disease is uncertain but relates to the implantation of loose hair into the depth of the natal cleft. This hair causes an inflammatory reaction that leads to acute infections, abscess formation, and chronic draining sinuses. The risk factors for PSD include obesity, local trauma or irritation, prolonged sitting, a deep natal cleft, and positive family history [3–5].

Surgical management of PSD depends on its presentation and include incision and drainage, laying open of the sinus tract, excision and healing by secondary intention, excision and primary closure and excision with advancement or transposition flap closure [6]. Although many surgical procedures have been tried, the best surgical method remains controversial because of high recurrence rates.

The aim of this study was to describe and evaluate the technique of comma-shaped incision with sacral flap for the management of chronic pilonidal sinus and review our experience with this technique.

Patients and methods

The Ethics Committee of Assiut University Hospital approved this study. Our study is prospective and written informed consent was obtained preoperatively for all patients.

Patients

All patients presented to General Surgery Department, Assiut University Hospital by de novo chronic pilonidal sinus in the period from March 2017 to June 2018 were included in our study. Recurrent cases, acute infections, and extremes of age were excluded. Hair epilation from the lower border of the scapula down to the back of the

thigh was performed for all patients and preoperative broad-spectrum antibiotics and antifungal treatment were prescribed whenever indicated.

Surgical technique

Under spinal anesthesia, the patient was placed in full prone position with separation of the two buttocks by an adhesive tape over the buttocks fixed down to the operating table. Skin incision was marked using a skin marker including all the visible sinus openings. Elliptical comma-shaped incision going toward one buttock and including all the sinus tracts was performed. The elliptical area of the skin was excised down to the periosteum using electrocautery as shown in Fig 1.

The coccygeal flap was elevated by cutting of the vertical septa between the skin and the coccyx causing flattening of the natal cleft and allowing suturing and wound closure without tension. Closed suction drain was inserted and primary wound closure was performed after removal of the adhesive tape as shown in Fig 2.

Postoperative analgesia was obtained by NSAID medications. Suction drain was removed 10 days after the operation and skin stitches were removed 15 days postoperatively. Upon discharge of the patient, instruction was given to continue hair epilation for at least 3 months after complete wound healing. Follow-up of patients was completed up to 1 year postoperatively.

Statistical analysis

The data were tested for normality using the Anderson–Darling test and for homogeneity variances before further statistical analysis. Categorical variables were described by number and percent, where continuous variables were described by mean and range. χ^2-Test and Fisher's exact test were used to compare between categorical variables while comparison between continuous variables was performed by *t*-test and analysis of variance. A two-tailed *P* values of up to 0.05 was considered statistically significant. All analyses were performed with the IBM SPSS 20 software (IBM Corp., Armonk, NY, USA).

Figure 1

Intraoperative picture showing raw area after excision of pilonidal sinus by a comma-shaped incision with sacral flap.

Results

Thirty patients with chronic pilonidal sinus were included in our study. The mean age was 34 years. Twenty-two patients were men and eight were women. The mean operative time was 27 min (15–35 min) as shown in Table 1. The mean period of hospital stay was 1 day and the mean duration off work was 2 weeks.

Two (6.6%) of our patients developed mild superficial wound infection detected on the seventh postoperative day and were managed successfully by systemic antibiotics and wound dressing. Two (6.6%) other patients developed seroma after drain removal and were managed by needle aspiration. No patients developed wound dehiscence or required further surgical interference as explained in Table 2.

One (3.3%) patient developed recurrence and was detected at the 3-month follow-up visit. Comparison between the patient who developed recurrence, two patients with wound infection, and the remaining 27 patients showed significant difference as regards age (P = 0.05) while no significant difference was detected as regards operative time or amount of drain fluid as shown in Table 3.

Figure 2

Intraoperative picture showing the wound after skin closure.

Discussion

Although surgery is agreed to be the best definitive treatment for PSD, there is no consensus on optimal surgical management [7,8]. The ultimate goal of surgical treatment for PSD is good wound healing, short hospitalization period, few complications, low recurrence rate, and patient satisfaction. The mainstay of operative management for the chronic disease is excision of all pilonidal sinus tracts. The optimal closure of the wound following an excision is debated. Primary closure can be accomplished by either midline or off-midline surgical flaps which include Karydakis, Limberg, Z-plasty, and V-Y advancement flaps [8–12].

In this study, we performed a comma-shaped incision with a sacral flap. The comma shape fashion of the incision aims to displace the suture line laterally, and thus regarded to be an off-midline repair. It has been clearly stated in the meta-analyses that off-midline closures provide less tension and better healing, and should become the standard management for PSD when primary closure is the desired surgical option [11–13].

By doing the sacral flap, the coccygeal septa are cut with subsequent flattening of the natal cleft. The flat natal cleft is less vulnerable to infection than the deeper one and enables reduced friction and decreased moisture within the cleft and avoids accumulation of new potential invading hairs. Cutting the coccygeal fibers has the disadvantages of being bloody and the increase in dead space after primary closure with the possibility of postoperative seroma. This was overcome by routine use of a suction drain. However, two of our patients developed seroma after suction drain removal.

The complication rate reported in our study is comparable to other reported complication rates of other off-midline surgical flaps. We have two (6.6%) patients who developed superficial wound infection and two (6.6%) other patients who developed seroma. In the study performed by Alvandipour *et al*.[14] comparing between Limberg and Karydakis flaps in the treatment of PSD, they reported incidence of wound infection and seroma in 3.7 and 11.1%, respectively, for the Limberg flap, while 8.1 and 35.1% for the Karydakis flap with a significant difference in the incidence of seroma (P = 0.028). In another study on 295 patients by Arslan *et al*. [15], they found that patients undergoing Karydakis flap surgery had a significantly higher rate of seroma formation compared with patients undergoing Limberg flap or modified Limberg flap surgery (19.8 vs. 5.2 vs. 7.4%).

Recurrence is the most concerning complication following surgery for PSD. Recurrence is mostly related to tension on the wound and it is significantly lower in off-midline than in midline flaps [11–13]. One out of 30 (3.3%) patients developed recurrence in our series. A wide range of recurrence rate was reported in the literature ranging from 0 to 20% [6,8,12–14]. Many studies suggested that postoperative hair epilation can help minimize recurrence by avoidance of hair inclusion in the wound [16,17]. The patient who developed recurrence in our study did not follow our protocol of continuous postoperative hair epilation and thus developed recurrence. Furthermore, the patient who developed recurrence was 58 years old and was significantly older than other patients (P = 0.05).

Table 1 Patient demographics

	n=30
Age (years)	34 (22-58)
Sex (female/male)	8/22
BMI (kg/m^2)	28 (22-31)

Table 2 Operative data and perioperative outcomes

	n=30
Operation time (min)	27 (15-35)
Blood loss (g)	25 (0-100)
Suction drain volume (ml/day)	45 (20-70)
Complications	
Superficial wound infection	2 (6.6)
Wound seroma	2 (6.6)
Mortality	-
Hospital stay (day)	1 (1-3)
Recurrence	1 (3.3)

Conclusion

The comma-shaped incision with sacral flap as a surgical treatment of chronic pilonidal sinus is feasible and has good results and few complications. Preoperative and postoperative hair epilation is important to avoid recurrence. Further prospective studies involving larger numbers of patients are still needed.

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Table 3 Postoperative complications regarding operative time and suction drain volume

	n=27 (mean±SD)	Recurrence (*n*=1)	Wound infection (*n*=2) [mean (range)]	*P*
Age (years)	33±9	58	38 (55-21)	0.05
Operation time (min)	27±5	30	27 (31-23)	0.72
Suction drain volume (ml/day)	40±13	50	55 (62-48)	0.2

Conflicts of interest

There are no conflicts of interest.

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