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Oblique Excision and Primary Closure of Pilonidal Sinus (Sacrococcygeal)

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ABSTRACT

Pilonidal sinus is a chronic disease of young age located at the sacrococcygeal region and is found mostly in males. The pathogenesis is generally accepted as the invagination of hair into the skin, followed by foreign body reaction leading to inflammation and abscess formation. The best surgical technique for sacrococcygeal pilonidal sinus is still controversial. The aim of this study was to examine outcome of oblique excision and primary closure of pilonidal sinus on recurrence rate. Between November 2008 and December 2010, 84 patients (69 male, 15 female; average age = 22.4 (12-42 years) were operated on for primary pilonidal sinus. An oblique fusiform-shaped incision was made and the skin with sinus was completely excised. The operation was completed with insertion of subcutaneous suction drain and primary closure of subcutaneous and skin. Patients' follow up was made at the end of the 4 weeks and 2, 4, 6, 12 and 18 months after surgery. Duration of symptoms ranged from 1 to 73 months (mean 20.02±7.87). Hospital stay duration ranged from 2 to 5 days (mean of 3.21±0.67), drain duration ranged from 3 to 11 days (mean 5.78±1.29). Wound dehiscence developed in 4 patients (4.8%). Healing by secondary intention occurred in 3 patients (3.5%) and recurrence in one patient (1.2%). The technique of oblique excision and primary closure may be considered one of the best operations for pilonidal sinus resulting in a low recurrence rate.

Key words: Pilonidal sinus, oblique excision, primary closure, drain duration, sacrococcygeal region

INTRODUCTION

Sacrococcygeal Pilonidal Disease (SPD) is a disease arises in hair follicle in the buttock cleft at the bottom of the sacral area. It is an acquired chronic inflammatory disease (Muzi et al., 2010). It is seen in young adults and the estimated incidence is 26 per 100,000 people and the condition is most frequent among men in their third decade of life. It carries high postoperative morbidity and patient discomfort (McCallum et al., 2007).

The etiology of SPD is unknown but it may relate to the implantation of loose hair into the depth of the natal cleft. A deep natal cleft is one of favorable environments for factors enhance SPD, e.g., sweating, maceration, bacterial contamination and penetration of hairs. Factors that influence SPD are the force of implantation, the nature of the hair and the vulnerability of the skin (Golberg et al., 1980; Aydede et al., 2001; Aldemir et al., 2003). During World War II, 78,924 patients were treated for SPD. Buie (1944) described the disease as "Jeep" disease because it was believed to be caused by sitting in vehicles for a long time. The condition is also known to occur in the interdigital spaces in barbers (Patey and Scraff, 1948), sheep shearers (Phillips, 1966) and dog groomers (Mohanna et al., 2001). A pilonidal dimple discovered accidentally without symptoms not require any treatment, but pain and purulent discharge with recurring acute abscess symptoms requires definitive treatment (Krand et al., 2009).

A wide variety of treatments have been advocated for SPD ranging from conservative nonsurgical treatments to extensive resections (McCallum *et al.*, 2007, 2008). The management is controversial as many treatment options are available. It includes excision with primary closure, cleft lift (Bascom and Bascom, 2007), transposed rhomboid flap (Arumugam *et al.*, 2003), Limberg flap (Erylimaz *et al.*, 2003), VY fasciocutaneous flap (Schoeller *et al.*, 1997) or Z-plasty (Sharma, 2006). However, there is no clear consensus as to optimal treatment and none of these approaches eliminates the risk of recurrence (McCallum *et al.*, 2007; Aldemir *et al.*, 2003; Aydede *et al.*, 2001; Holzer *et al.*, 2003; Abu Galala *et al.*, 1999; Chintapatla *et al.*, 2003).

Holmebakk and Nesbakken (2005) indicated that traditional midline techniques for pilonidal sinus repair give a high wound infection rate, high recurrence rate and a long time to heal. The ideal treatment should be simple, with low morbidity and recurrence rates, hospitalizations should be short with painless postoperative periods and good wound healing and the patient should have an early return to normal activity (Al-Jaberi, 2001). However, the major concern in this type of surgical procedure is disease recurrence. The recurrences can be reduced by avoidance of vertical midline wound in the natal cleft. The second concern is prolonged wound healing either because of the infection or excess tension (Unalp *et al.*, 2007). The aim of the present study was to evaluate the results of oblique excision and primary closure technique for treatment of sacrococcygeal pilonidal sinus.

MATERIALS AND METHODS

This study included 84 patients who underwent surgery for primary pilonidal sinus disease in sacrococcygeal region. All procedures were performed in the Department of General Surgery at El-Azhar University Hospital (Damietta) between November 2008 and December 2010. The data obtained were age, gender, body mass index, duration of the symptoms, past history of drainage, duration of hospital stay and duration of removal of drain. Follow-up examinations were conducted at 4 weeks and 2, 4, 6, 12 and 18 months after surgery. All patients were operated on under spinal anesthesia. A single dose of second generation cephalosporin 1 g was administered i.v., 30 min before skin incision for prophylaxis against wound infection and continued postoperatively for 2 days (i.v., B.I.D), followed by oral rout for 7 days. Postoperative pain management consisted of diclofenac sodium 75 mg i.m., B.I.D, for 2 days followed by oral administration of (NSAID) for 5 days.

Surgical technique: Following medical evaluation, the patients were admitted to the hospital the night before operation. The sacrococcygeal area was shaved one hour before surgery. After satisfactory spinal anesthesia, the patients were placed in the prone, jackknife position, with the buttocks strapped apart with the use of adhesive bands. The extent of sinus was determined by injection of methylene blue through the opening of sinus and palpation. The site of skin incision was marked by an oblique fusiform line (Fig. 1), which include all opening of sinus and its extension. After sterilization and d r aping, skin incision was taken down with subcutaneous tissue until complete excision of sinus and surrounding subcutaneous tissue en bloc (Fig. 2), taking care to avoid cutting through the sinus which identified by bluish discoloration of track or leak of dye. Warm wet packs were applied for 5 min and then hemostasis was accomplished by electrocauterization. After removing the specimen, subcutaneous suction drain was inserted through separate stab, followed by wound closure achieved by deep mattress stitches using polypropylene 0 through the skin, subcutaneous tissue and floor of the wound which lifted untied to allow subcuticular skin closure of wound using polypropylene (2/0) followed by tying mattress stitches (Fig. 3). All patients were permitted to rest for 20 days after the operation for wound

Fig. 1: The site of skin incision marked by an oblique fusiform dotted line, which include all opening of sinus and its extension

Fig. 2: The wound after Complete excision of sinus and surrounding subcutaneous tissue en bloc

Fig. 3: Wound closure achieved by deep mattress sutures of the skin, subcutaneous tissue and floor of the wound with polypropylene 0 and subcuticular skin closure with polypropylene 2/0

healing. Sutures were removed 15-21 days after surgery. After suture removal, the patients were able to return to their normal daily activities.

RESULTS

The present study included 84 patients, 69 (82.1%) were males and 15 (17.9%) were females. The most observed symptoms alone or together were pain in 63 cases (75%), swelling in 42 cases (50%) and occasional discharge in 34 cases (40.7%). Wound dehiscence developed after the removal of sutures in 4 patients (4.8%), no hematoma occurred. Healing by secondary intention occurs in 3 patients (3.5%) (Fig. 4) and recurrence occurred in one patient (1.2%), (Table 1).

Fourteen cases (16.6%) had a history of abscess drainage before the definitive surgery, while 70 patients (83.3%) had not undergone abscess drainage before the definitive surgery (Data not presented).

The average age was 22.41±5.59 (range, 12-42) years. Weight ranged from 40 to 100 kg with a mean of 69.25±7.42 kg, height ranged from 1.50 to 1.83 m with a mean of 1.70±0.056 m. The BMI ranged from 17.87-32.65 with a mean 23.88±1.40 kg m^{-2}. Duration of symptoms ranged from 1 to 73 months with a mean of 20.02±7.87 months. The duration of hospital

Table 1: Frequencies of gender, complaint and complications after surgical interference

Parameters	Frequency	Percent
Gender		
Male	69	82.1
Female	15	17.9
Pain	63	75.0
Swelling	42	50.0
Discharge	34	40.7
Wound dehiscence	4	4.8
Recurrence	1	1.2

Fig. 4: Female patient in which complete healing of the wound by secondary intention occur after wound dehiscence 2

Table 2: Descriptive statistics of age, patients some morphological description and duration of symptoms and hospital stay in studied cases

Characteristics	Mean	SD	Minimum	Maximum
Age (years)	22.41	5.590	12.00	42.00
Weight (kg)	69.25	7.420	40.00	100.00
Height (m)	1.70	0.056	1.50	1.83
BMI(kg m^{-2})	23.88	1.400	17.87	32.65
Duration of symptoms (month)	20.02	7.870	1.00	73.00
Duration of hospital stay (days)	3.21	0.670	2.00	5.00
Duration of drain (days)	5.78	1.290	3.00	11.00

stay ranged from 2 to 5 days with a mean of 3.21±0.67 days while duration of drain ranged from 3 to 11 days with a mean of 5.78±1.29 days (Table 2).

DISCUSSION

Chronic SPS is a frequent disease among young male adults resulting in distressing symptoms and long-term loss of working ability. A pilonidal dimple discovered accidentally and had no symptoms require no treatment, but pain and purulent discharge with recurring acute abscess symptoms requires definitive treatment (Krand *et al.*, 2009). Primary closure was reported to be the method of choice in treatment of pilonidal disease. It has the advantage of shorter wound healing and less time off from work. However, the recurrence potential of the disease is still a major problem (Unalp *et al.*, 2007; Mentes *et al.*, 2006; Akinci *et al.*, 2000).

The midline excision was reported to have a high rate of complications and recurrences. The depth of the intergluteal sulcus and the vacuum effect created between the buttock and incision scar in the intergluteal line are responsible for recurrence (Mentes *et al.*, 2008).

On the other hand, we choose the technique of oblique incision as it provides less tension on the incision, shorter healing time and no remaining incision scar on the intergluteal line. The present study included 84 patients, 69 (82.1%) were males and 15 (17.9%) were females and these results are in agreement with that reported by Guyuron *et al.* (1983) who reported that, sacrococcygeal pilonidal disease afflicts mainly young adults after puberty and occurs predominantly in males (80%). In addition, a Norwegian study estimated the incidence of disease at 25 per 100,000 (Sondenaa *et al.*, 1995). The patient population is predominantly males. On the other hand, Mentes *et al.* (2006) reported that, of the 493 patients, 490 (99.4%) were males and 3 (0.6%) were females. Their results reflected a fact that the disease is nearly exclusive to males and the percentages of males are higher that reported in the present work. This wide difference may be attributed to different sociocultural factors and to small sample size of the present study in comparison to their study.

Weight ranged from 40 to 100 kg with a mean of 69.25±7.42 kg, height ranged from 1.50 to 1.83 m with a mean of 1.70±0.056 m. The BMI ranged from 17.87±32.65 with a mean 23.88±1.40 kg m^{-2}. These results are in agreement with that reported by Mentes *et al.* (2006) who reported that, the mean Body Mass Index (BMI) of all cases was 24.66 T 2.65 (range, 17.72-34.16) kg m^{-2}.

In addition, Cubukcu *et al.* (2001) emphasized that obesity alone is not a predisposing factor. Majority of our patients had normal BMI. This supports the opinion that obesity is not a predominant factor for pilonidal sinus but pilonidal sinus occurs as a result of the combination of factors such as local trauma, poor body hygiene, too much sweating, deep natal cleft and excessive exercise.

Duration of symptoms ranged from 1 to 73 months with a mean of 20.02±7.87 months, indicating the chronicity of the disease process. These results are in accordance with that reported by Mentes *et al.* (2006) who reported that, the mean duration of symptoms was 22.09±17.12 (range, 1-120) months.

In the present study, the most observed symptoms alone or together were pain in 63 cases (75%), swelling in 42 cases (50%) and occasional discharge in 34 cases (40.7%). These results are comparable to those reported by Mentes *et al.* (2006) who reported that, the most observed symptoms alone or together were pain in 82%, mass or swelling in 80% and occasional discharge in 36%. On the other hand, Sondenaa *et al.* (1995) noted discharge in 66%, swelling in 50% and pain in 35% of patients with chronic pilonidal disease at presentation. This difference reflects the wide variation of presentation of chronic pilonidal sinus.

In the present work, the duration of hospital stay ranged from 2 to 5 days with a mean of 3.21±0.67 days. These results are in agreement with Akinci *et al.* (2000) who operated on 92 patients using an asymmetric elliptical excision and primary closure and the mean length of hospital stay was 2.8 days. In addition, Al-Hassan *et al.* (1990) operated on 46 patients with excision and closure and the mean length of hospital stay was 3 days. On the other hand, These results are shorter than those reported by Mentes *et al.* (2006) who reported that, the mean duration of hospital stay was 5.51±2.85 (range, 2-17) days. This may attributed to the large number of cases they included in their study with increased number of complicated cases that needs other surgical interference. They reported that, twenty-two patients (4.4%) had recurrent disease and required one or more additional procedures. The recurrence rate in the present study was only 1.2%.

In the present series, no hematoma or seroma occurred due to presence of suction drain. Erdem *et al.* (1998) performed the closed suction drainage on solely half of their patients; however, they did not find any statistically significant differences between the two groups regarding the length of hospital stay, infection and the rate of hematoma. Krand *et al.* (2009) believed that performing a fastidious hemostasis by electrocautery and reduction of dead sections in the surgical area reduces the development of hematoma or seroma to a minimum and eliminates the need for drainage.

In the present study, wound dehiscence developed after the removal of sutures in 4 patients (4.8%), repeated daily dressing for 40-60 days till complete healing which occurred in 3 patients. These results agreed with that reported by Mentes *et al.* (2006) who reported that, wound dehiscence was less prevalent in comparison to other studies after the removal of sutures because the majority of their patients' BMI was within the normal range.

No infection after operation was reported in the present study. These results are in contradiction to those reported by Petersen *et al.* (2002) found infection in 11.1% of 1731 patients. Spivak *et al.* (1996) and Akinci *et al.* (2000) found infection rates of 14% and 3.2%, respectively. A second generation cephalosporin 1 g twice daily for 2 days followed by oral administration for 7 days. This treatment regimen was found effective for controlling the postoperative infection rate.

In the present study, recurrence occurred in one patient (1.2%). This value is lower than that reported in the literature. They reported that, recurrence rate for oblique excision and primary closure varies from 9.4 to 11% (Akinci *et al.*, 2000; Petersen *et al.*, 2002). Sondenaa *et al.* (1995) operated on 120 patients with a median follow-up time of 4.2 years and recurrence was noted in 5%. Al-Hassan *et al.* (1990) operated on 46 patients with a median follow up of 33 months and recurrence was noted in 20%. Al-Jaberi (2001) operated on 46 patients with recurrence noted in

4%. In addition, it was reported that, the recurrence rate for primary midline closure was reported as 9 to 17.9% (Topgul *et al.*, 2003), whereas the recurrence rate for oblique excision with primary closure was 0.9 to 5.6% (Mentes *et al.*, 2006; Akinci *et al.*, 2000). These data reflects the best results of oblique incision in comparison to primary midline incision.

CONCLUSION

The technique of oblique excision and primary closure is simple, with low morbidity and recurrence rates with short hospitalizations and painless postoperative periods with good wound healing. Patients returned early to their normal activity. So, it considered one of the best operations for pilonidal sinus.

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