

Comparison of results of minimal invasive surgery for pilonidal sinus with Karydakis procedure: less is more

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Abstract

Aim: Controversy still remains regarding the best surgical technique to use for the treatment of pilonidal disease to minimize disease recurrence and patient discomfort. Minimal surgical procedures can be performed on an outpatient basis. In this study, the early results of our minimally invasive operative approach cases are compared with Karydakis flap reconstruction results.

Material and methods: From January 11, 2012 to January 23, 2013, 312 patients were diagnosed with pilonidal sinus and treated in our clinic. Eighty-two of these patients (35 treated by a minimally invasive procedure (group I), 47 by the Karydakis flap procedure [Group II]) were included in the study. Data were collected by reviewing the patients' records and by conducting telephone interviews.

Results: The follow-up time of each case for Group I was 35 months and the average follow-up time was 32.5 months for Group II (interval, 24-40 months). Group I patients returned to work in 1 day; however, 40 patients (85.1%) in Group II returned in 20 days and 7 (14.9%) returned to work in 30 days. In group I, 32 patients (94%) were satisfied and 2 patients (5.7%) were not satisfied. In Group II, 32 patients (68.1%) were satisfied with the results of the surgical procedure and 15 patients (31.9%) were not satisfied. Our recurrence rates for group I and II were 5.7% and 6.4% for the first year, respectively.

Conclusion: This indicated that the minimally invasive operative procedure can be performed with a low recurrence rate on a one day outpatient basis.

Keywords: Pilonidal Sinus; Minimally Invasive Surgery; Karydakis Flap Procedure.

INTRODUCTION

Sacrococcygeal pilonidal sinus is an infection of sacrococcygeal skin that predominantly affects young adult men of working age (1). It may appear as asymptomatic pits in the natal cleft of the sacrococcygeal area, but usually patients present with a painful acute abscess or with chronic suppurative infections (2). Though controversy still remains regarding the best surgical technique to use for the treatment of pilonidal disease to minimize disease recurrence and patient discomfort, several treatment modalities have been tested for the treatment of pilonidal disease (3,4).

These include shaving, incision and drainage, phenol application, cryosurgery, excision with primary closure, excision with open packing, excision with marsupialization, and, most recently, flap surgery (4). Wide excision of sinus cavities and their tracts is the most frequently used treatment procedure (5). However, this intervention leaves a large, deep wound that is left to secondary healing and requires marsupializing

or primary suturing, and, finally, reconstruction with cutaneous flaps (4).

All of these procedures are performed under general or local anesthesia. This results in substantial medical resource consumption, very high costs of long hospitalization time, long absences from work or school, and postoperative pain (6). On the other hand, the minimally invasive surgical procedure can be performed as a simple outpatient procedure which eliminates all of these disadvantages.

In this research, we wanted to examine the early results of our pilonidal sinus cases which were treated with wide circumferential incision of the pilonidal orifice which could be considered a minimally invasive operative approach. These results were compared with the results of cases reconstructed with the Karydakis flap procedure.

MATERIALS and METHODS

The records of 312 patients, who underwent surgical treatment of pilonidal sinus between January 11, 2012,

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and January 23, 2013, were retrospectively screened. Of the 82 patients, 35 (4 F, 31 M) were treated with the minimally invasive operative approach, and 47 (14 F, 33 M) were treated using the Karydakakis procedure. These were the subjects of our study. Of the patients with multiple sinus orifices (4 or more) with the distance between two orifices equal to or greater than 8 cm, the Karydakakis procedure was used. In cases of pilonidal sinus abscess, neither antibiotic nor premedication treatment was used prior to the minimally invasive procedures. However, broad spectrum antibiotic was used for 10 days in postoperative period of minimally invasive procedures. But, if the Karydakakis procedure was performed, the pilonidal sinus abscess was drained and then treated with antibiotics prior to the surgery. Clinical, operative, and follow-up data were recorded. Long-term follow-up was provided by conducting telephone interviews with the patients.

Surgical Technique

The minimally invasive operative approach was performed with the patient in the prone position. The sacrococcygeal area was shaved and cleaned with antiseptic solution. Local anesthesia was achieved by slowly injecting lidocaine (20 mg/ml) into the planned incision sites. A partial sinusectomy with a narrow elliptical incision (with the opening of the incision facing towards the cranium) was performed. Pits leading to subcutaneous cavities were excised down to the cavity, but the caudal part of pilonidal sinus or sinus drainage pathways were not excised (Figure 1).

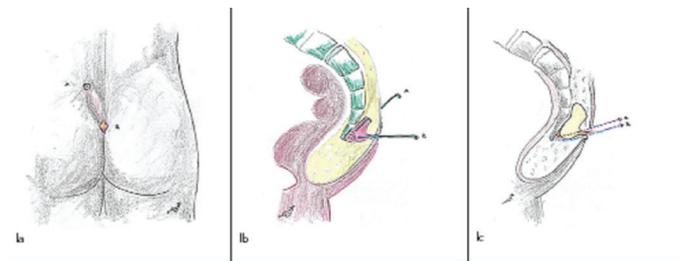


Figure 1. Surgical Technique. Ia: Sectional view of the pilonidal sinus (A: sinus drainage orifice, B: elliptical incision of primary sinus orifice). Ib: Image of the incision of pilonidal sinus orifice (A: drainage of the sinus tract, B: access to primary sinus orifice). Ic: Excision of primary sinus orifice and the caudal portion (tissue between the A and B line)

Minor bleeds were controlled by electrocautery. The sinus cavity was cleared of hair and debris using surgical forceps and the base was curetted. The pit of the drainage tract was excised and curetted to impair epithelialization. Following hemostasis, a Penrose drain was placed into the sinus orifice and the drainage path, if it existed. All patients received postoperative antibiotic therapy. The Karydakakis procedure was performed following conventional procedure guidelines.

Statistical Findings

Statistical analyses were undertaken using the SPSS statistical package (SPSS 21.0 for Windows, SPSS Inc.,

Chicago, IL). A non-parametric test was performed to gather nominal data. If the smallest frequency was less than 5 in fewer than 20% of the cells, the Chi-square test was applied. However, if the smallest frequency value was less than 5 in more than 20% of the cells, Fisher's test was used to predict the expected value. The Kolmogorov-Smirnov normality test was used to evaluate the digital values. Homogeneity of the groups was assessed by use of the Levine test. Normal distributions were provided and included in independent samples from the parametric student's t-test that was performed. Statistical significance was defined as a P value of < 0.05.

RESULTS

Sixty-four of the 82 (78%) patients were men and 18 (22%) were women. The average age was 29 years, and their ages ranged from 17 to 55 years. Thirty two of 35 patients in group I and 40 of 47 patients in group II had not had pilonidal surgery previously. Body mass index was less than 25 in 35% of Group I and less than 25 in 47% of Group II. Preoperative abscesses were found in Groups I and II: 3 (8.6%) and 6 (12.8%) cases, respectively. The minimal surgical procedure was used on the 3 patients in Group I in a single session.

However, the Karydakakis flap reconstruction was performed on the 6 patients in Group II in a second session. All of the Group I surgeries were performed under local anesthesia; the Karydakakis flap reconstruction was performed under spinal anesthesia. Group I patients returned to work the day after the operation. In Group II, 40 (85.1%) patients returned to work within 20 days, and 7 (14.9%) patients returned to work within 30 days. The patients in Group I were not restricted from sitting or lying in the supine position. However, in Group II, 25 (53.2%) patients were advised for 15 days, and 22 (46.8%) patients were advised for 10 days not to sit or lie supine for extended periods. In Group I, postoperative recurrence occurred in 2 (5.7%) of the cases, but the patients did want another surgery, so a close follow-up with a dressing was done. However our recurrence rates for Karydakakis procedure was 6.4% for the first year. In Group II, complications occurred in 15 (32%) of the cases. Postoperative seroma or abscesses were not seen in Group I, but in Group II, there were 11 (23.4%) and 4 (8.5%), respectively. In group II, 3 (6.4%) cases were re-sutured, and in 3 cases (6.4%), the Karydakakis flap reconstruction was redone (Table 1). Wound healing time in Group I was 7 days for 23 (65.7%) of the patients, 10 days for 11 (3.4%) of the patients, and 12 days (2.9%) for one patient. In Group II, healing time was 10 days for 35 (74%) of the patients, 15 days for 9 (19%) of the patients, and 20 days for 3 (6%) of the patients. When the patients were questioned about their satisfaction with the results of the operation, 32 patients (94%) in Group I were satisfied and 2 patients (5.7%) were not satisfied. In Group II, 32 patients (68.1%) were satisfied with the results of the surgical procedure and 15 patients (31.9%) were not satisfied.

Table 1. Demographic characteristics of the patients

		Group I (minimal invasive surgery) (n = 35)	Group II (Karydakias flap procedure) (n = 47)	P
Age (year)		31.2	29.5	0.388
Sex (M/F)		31/4	33/14	0.047
Body mass index (kg/m ²)		21.6 ± 12.9	26.9 ± 2.81	0.362
Disease duration (months)		16	18	
Symptoms	Drainage	22%	24%	
	Swelling	50%	45%	
	Bleeding	5%	7%	
	Itching	20%	18%	
Average number of orifices (n)		1.57 ± 0.78	1.53 ± 0.72	0.81
Abscess drainage history		3 patients	6 patients	0.410
Excision Revised		3 patients	7 patients	0.30
Anesthesia type	Local	35 patients		
	Spinal		47 patients	
Two-step process		0 patients	6 patients	0.031
Dissatisfaction		2 patients	15 patients	0.04
Recurrence		2 patients	3 patients	0.63
Time to return to work		1 day	21 days	0.001
General complications		2 cases	15 cases	0.004
Postoperative seroma		0	11	0.001
Postoperative abscess		0	4	0.102
Postoperative re-stitching of the wound		0	3	0.183
Headache			5 patients	

DISCUSSION

Pilonidal sinus disease is characterized by pain and abscess formation and is often seen in young, active working men (7). An ideal treatment of pilonidal sinus should provide a short absence from work time and low recurrence rate (8). In many centers, a wide excision up the sacrococcygeal fascia and secondary recovery or primary closure of the wound has been implemented as a standard treatment of pilonidal sinus. However, a long wound healing time may extend up to 3 months, and absence from work or school may be as long as one month. These are important issues for patients. Also, sinus excision increases the healthcare costs due to the use of anesthesia and hospitalization. In addition, sinus excision is also responsible for severe headaches from local anesthesia, postoperative pain, and delay in the patients' return to work or school. Moreover, precautionary measures drastically affect the patients' quality of life (7).

The ideal treatment procedure for pilonidal sinus should be an inexpensive, simple outpatient procedure with a low recurrence rate which causes the least amount of discomfort while allowing for an early return to work or school. In this sense, modalities such as excision and flap reconstruction techniques are far from ideal, despite their low recurrence rates (9).

The less radical treatment of pilonidal sinus goes back to the World War II (WWII). Phillips suggested a less invasive marsupialization of infected PS which was prevalent among U.S. soldiers to keep them in combat ready condition. PS was nicknamed jeep disease (10). In 1965, Lord and Millar suggested a minimally invasive operative approach, consisting of a narrow elliptical excision of pilonidal pits only, and debridement and cleaning of the unroofed underlying cavity (11). In 1980,

Bascom reported the individual excision of midline openings and added a laterally-placed parallel incision to better explore and clean the pilonidal cavity and to facilitate the identification of diseased follicles (12). Bascom also sutured midline operative wounds and excised lateral tracts (13). In our protocol, pit excision was performed with a narrow elliptical excision, but we did not suture the pilonidal sinus orifice or lateral drainage tracts. A Penrose drain was put in place to prevent premature closure of the wound. Premature closure results in delayed secondary wound healing and increases the risk of early complications such as abscess formation (9). The pit excision effectively eliminated these risks, without having a negative effect on the wound healing process (9). We did not apply any sclerosing agent on the sinus epithelium but curetted it to impair epithelialization and followed up with a regular dressing.

The length of hospital stay and absence from work terms depend on the surgical approach to pilonidal surgery (13). These are the widely accepted measures of the value of any surgical approach (14). In our study, the average length of hospitalization was 1.5 days in Group II, and these patients returned to work in approximately 21 days. Recently published literature demonstrates that the mean length of stay is from 2.7 to 3.2 days for patients undergoing the Karydakis procedure (15,16), and these patients returned to their jobs in 12.4 to 20 days (17). Our results about return to work time are compatible with the findings in scientific literature. In Group I, no patients stayed in the hospital after the operation, and they all returned to work the next day.

Asymmetric radical excision and reconstruction with cutaneous flaps has a low annual rate of recurrence of 0 to 4.4% (18). However, in the minimal surgical procedure recurrence, rates increased over the span of a year (7). Many publications have shown that recurrence occurred in the first 5 years (19-21). Soll et al. demonstrated that recurrence rates for PS treated with the minimal surgical procedure increased annually, and they gave the recurrence rates as 6.5%, 13.2%, and 16.2% for the first year, the first 5 years, and the first 10 years, respectively (7). They reported that the recurrence usually occurred in the first 2 years (7). Gips et al. reported this rate as 6.5% for the first year and 11.5% over the first 4 years (21). Our recurrence rates for the minimally invasive surgical procedure and the Karydakis procedure were 5.7% and 6.4% for the first year, respectively. These rates are compatible with the literature, but there was no statistical difference between the two methods in terms of recurrence ($p = 0.9$). There was no statistically significant difference in recurrence rates between the two treatment methods we performed; however, when we compared the return to work times, the difference was statistically significant. It is known that recurrence is common in the first 5 years, so the lack of a 5-year follow-up is a limitation of this study.

As a result, shorter hospital stay, quicker healing, shorter absence from work time, lower rates of recurrence, and lower pain perception are the main advantages of the minimally invasive surgical approach. Altogether, these parameters add to patient comfort and satisfaction after surgical treatment. It is preferred for patients who do not have multiple sinus orifices (4 or more) or if the distance between 2 orifices is more than 8 cm because of its acceptable recurrence rates. Finally, in terms of job loss, a minimally invasive operative approach compared with asymmetric flaps is significantly superior compared with flap techniques.

Conflicts of interest: All authors declare that they have no conflicts of interest. This study was designed as retrospective research so that informed consent was obtained from all individual participants included in the study but we have no ethical approval for this article. However this article does not contain any studies with

human participants or animals performed by any of the authors.

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