ORIGINAL ARTICLE

Recurrence Rates In Pilonidal Sinus Surgery: Comparison of two Techniques (Karydakis Versus Conventional Open Excision)

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ABSTRACT

This was a prospective study carried out from September 2003 to September 2005 at the Surgical Department of Lahore General Hospital. The purpose of this study was to compare the recurrence rates in the recently popularized Karydakis technique and the conventional open excision for pilonidal sinus disease. Total number of patients in this study was 30 (15 patients of Karydakis technique and 15 patients of conventional open excision). The study showed that the period of post-operative hospital stay was higher in the Open excision group as compared to the Karydakis group. Similarly, early post-operative complications were more in the Open excision group as compared to the Karydakis group. The most significant finding in this study was that after follow up of one year there was no recurrence in patients operated by the Karydakis technique, whereas in the Open excision group the recurrence rate was as high as 30%. This study highlights that Karydakis technique, although a relatively new technique, is a superior alternative to Open excision for pilonidal sinus disease. It is safe, cost effective and has the main advantage of being recurrence free.

Key words: Pilonidal sinus, Karydakis technique, Open excision.

INTRODUCTION

This research project was undertaken as part of Masters Degree in General Surgery submitted to the University of Health Sciences, Lahore. The aims and objectives of this study were to compare and contrast the merits and demerits of Karydakis technique and Open excision for pilonidal sinus disease, with special reference to recurrence rates. Hence to find out the more efficient method of pilonidal sinus surgery.

The word pilonidal is derived from "pilus" meaning hair and "nidal" meaning nest[1]. In 1830 Herbert Mayo described pilonidal sinus as hair containing sinus[2]. Later in 1880 Hodges further described that pilonidal sinus is a tract containing hair in the sacrococcygeal area[3]**.** For a long time this disease was considered to be those of jeep drivers[4], as it caused more than 80000 US Army soldiers to be hospitalized, during World War II[5]. The frequency of this disease in the USA is 26/100,000 population[6].

A pilonidal sinus can occur in many different parts of the body. However the commonest variety is found in sacrococcygeal area in the natal cleft approximately 5cm proximally from the anus and the characteristic pilonidal sinus has a midline opening[7]. Endoanal type of pilonidal sinus is a very rare variety affecting the perianal skin directly or may occur circumferentially around the anus involving the skin of the anal verge[8]. Other rare varieties are sinuses in the axilla, umbilicus and the web spaces in the fingers of the barbers with hairs being those of the customers[9].

The disease is male predominant, it occurs 2.2 times more often in males than females[10]. It is a disease of young age, and affects individuals in their mid second to fourth decade of life[11]. Risk factors for the disease are male gender, family predisposition, obesity, hairy individuals, repeated trauma and prolonged sitting (occupational)[12]. Anaerobic bacteria particularly bacteroides and aerobic staphylococci are the most common organisms isolated[10,13]. Once it was thought that every pilonidal sinus contained a nest of hairs; in reality only 50% of the cyst and sinuses are found to have hairs during exploration[14]. Malignant change is a relatively rare complication of pilonidal disease however 50 cases of malignant degeneration of pilonidal sinus have been reported in literature[15,16]. The most common type is the squamous cell carcinoma arising after decades of antecedent pilonidal disease[17] and though its pathophysiology is uncertain, yet the ongoing process of tissue damage and repair in the presence of chronic inflammation may be implicated. Although malignancy is a rare complication, it is a significant risk to young men and a more sinister reason why, besides discomfort and inconvenience, pilonidal disease should be taken seriously[18].

This disease can present as acute pilonidal abscess, chronic pilonidal disease and complex or recurrent pilonidal disease[19]. The acute condition (abscess) is exquisitely painful, usually presents urgently and requires emergency treatment. This can be treated by incision drainage and curettage under

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general anesthesia. For chronic or recurrent pilonidal sinus many procedures have been described but none of them is perfect as judged by the yardstick of primary healing and recurrence of the disease[20]. A procedure that results in rapid wound healing, abolition of sepsis and no recurrence of the problem is the ultimate goal[21].

Several series of studies have shown that excision with primary closure is preferable to excision with an open wound in many respects: less bleeding, less wound breakdown, lower infection rate, reduced wound pain, fewer post-operative visits, shorter time off work and faster healing time[22]. Karydakis devised a primary flap closure operation resulting in obliteration of the natal cleft and lateralization of the wound, with a recurrence rate of 4%[23,24]. Asymmetric excision with a Karydakis flap is the only operation that takes the whole wound away from the midline, it has a very low recurrence rate, fast healing time and short period off work[25]. The only drawback of this technique is that it takes longer hospital stay and re-operation is needed if the wound gets infected[26].

The objective of this study was to assess and compare the morbidity and / recurrence rate in pilonidal sinus operated with Karydakis technique versus open excision. The other purpose of this study was to assess the validity of reported superiority of the Karydakis technique over open excision in our setup.

PATIENTS AND METHODS

This was a prospective study comprising a total of thirty patients suffering from pilonidal sinus disease (15 patients of Karydakis technique and 15 patients of open excision). Patients were randomly allocated to the two groups and included patients of both sexes of ages 15 to 60 years who consented to take part in the study and were willing to come for follow up for one year. All the patients were asked to come for follow-up fortnightly for a month, then monthly for six months and then every 03 months for another six months. This study was conducted on patients who presented in the Surgical Department of Lahore General Hospital affiliated to Postgraduate Medical Institute, Lahore from September 2003 to September 2005. Patients with pilonidal abscess were excluded from this study.

All patients were subjected to detailed preoperative clinical assessment, including history, physical examination along with routine blood and urine investigations, ECG and chest X-Ray. Pre-operatively the area of operation including the buttocks and the natal cleft were shaved a day before operation. Prophylactic antibiotics were given intravenously at the time of induction of anaesthesia. Under general anesthesia patients were put in the prone position and either open excision or Karydakis procedure was carried out.

Open Excision Technique: In open excision technique after draping the area, an elliptical incision 2cm away from midline and/or the sinus openings was given. The scalpel was inserted down to the muscle and sacral fascia to remove a boat-shaped wedge of tissue including the whole sinus tract along with fibrous tissue upto the sacral periosteum. After washing the wound with normal saline, it was left open by packing with pyodine soaked swab. In this technique daily repacking of the wound was performed allowing it to heal by granulation and secondary intention.

Karydakis Technique: After draping the area an asymmetrical biconcave incision was made around the sinus pits, and excision and curettage of the sinus was done. The cavity was thoroughly washed with normal saline. The medial side of the wound was then undermined for a distance of 2cm and at a depth of about 1cm to produce a flap extending the full length of the wound. Layers of interrupted absorbable sutures (vicryl no. 0) were placed and left un-tied, the needle passing into the sacral fascia in the midline and then taking large bites that included both surfaces of the undermined flap. With the assistant approximating the two edges of the wound, the series of untied sutures are then tied. A suction drain was placed across these knots and brought out well laterally before the second layer of sutures was placed to approximate the undersurface of the flap to the fat in the lateral edge of the wound. Interrupted 2/0 prolene sutures were applied to the skin.

In all cases the excised sinus was sent for histopathology. In the post-operative period all the patients were kept for 48 hours in the ward and given I/V antibiotics with analgesia as required. The dressing was taken down and the wound examined at the time of discharge. The patients were discharged on oral analgesics and were called for follow up on 7th post-operative day for wound examination and removal of the drain.

RESULTS

The results of the study population were compared with the matched pairs (t) test for equality of the means; chi-square was calculated for the discrete and/or non-numerical variables. The significance level was fixed at 0.05 p value. The t and p value and chi-square were calculated by the equation: t = Xi – Xii / sp in SPSS version (Statistical Package for Social Sciences).

This study comprised 30 patients with pilonidal sinuses who underwent surgery either by open surgical technique or by Karydakis technique. Patients with acute pilonidal abscesses were of course excluded from the study. The patients were between the ages of 15 to 40 years and the peak incidence of the disease was observed between the ages of 21 to 30 years. One patient was eighteen (18) years old and eleven (11) patients out of 30 were between the ages of 21 to 25. Ten (10) patients were between the ages of 26 to 30 years, seven (7) patients were between 31 to 35 years and only one (1) patient was 40 years old. The mean age of the patients was 28.05 years. The mean age of the patients that underwent Karydakis procedure was 27.7 years, while that of open excision was 28.4 years(Table 1). Though the selection of patients for either group was random, however the study population shows the group that underwent open excision were of a slightly higher age group as compared to the group that underwent the Karydakis operation. The reason for this was that in the former group five (5) patients had previous surgery on one or more occasion for the same problem, while in the Karydakis group only three patients had previous surgery.

Table 1: Age distribution

Age (years)	Group I Karydakis Technique (n=15)	Group II Open excision (n=15)	Total (n=30)
15-20	-	01	01
21-25	06	05	11
26-30	05	05	10
31-35	04	03	07
36-40	-	01	01
Total	15	15	30
Mean± SD	27.7±4.99 years	28.4±5.59 years	28.05±5.29 years

Only three (3) patients were females and the study was explained to them prior to any intervention. One of them accepted the Karydakis technique while the other two refused to be operated upon by Karydakis technique, but were ready to be operated by the conventional open excision (Table 2). Though all the three female patients were willing to come for follow-up visits. The less number of female patients in this study reflect the general opinion that females as compared to males have less incidence of having pilonidal sinus disease and also that females in our country are reluctant to seek medical/surgical treatment for pilonidal sinus disease.

The duration of operation in this study was defined as, duration from skin incision to skin closure, not including the duration of induction of anesthesia.

Table 2: Sex distribution

Sex	Group I - Karydakis Technique (n=15)	Group II - Open excision (n=15)	Total (n=30)
Male	14	13	27
Female	01	02	03
Ratio	14 : 1	6.5 : 1	9 : 1

The duration of operation in the Karydakis group ranged from 35 to 60 minutes. The mean duration of operation in this group was 45.7 minutes. While the duration of operation in the open excision group ranged from 20 to 35 minutes with a mean operating time of 25 minutes. This data reveals that the Karydakis technique is more time consuming as compared to the open excision technique with a mean time difference of 20.7 minutes. This is because in the open excision technique only the sinus bearing tissue is removed and packed, while in the Karydakis technique after excision of the tissue, dissection and undermining is done with two layers of stitches applied over a suction drain. This takes 20 minutes more than the open excision (Table 3).

Table 3: Operating time

Time (minutes)	Group I Karydakis (n=15)	Group II Open excision (n=15)	Total (n=30)
20-25	-	10	10
26-30	-	4	4
31-35	-	1	1
36-40	7	-	7
41-45	2	-	2
46-50	4	-	4
51-55	-	-	-
56-60	2	-	2
Mean±SD	45.7±4.99 minutes	25.0±5.0 minutes	

Post-Operative hospital stay was compared in both groups. It was defined as the number of days the patient remained in the hospital after operation but excluded the operation day and included the day of discharge. In this study, the postoperative hospital stay of the patients ranged from 02 to 10 days. In the Karydakis group the hospital stay ranged from 02 to 05 days with a mean of 3.2 days, while in case of open excision the postoperative stay in hospital ranged from 03 to 10 days, with a mean of 5.2 days (Table 4). In the Karydakis group the majority of the patients had a very short stay in hospital, only three patients had stay of five days including a patient whose wound had to be layed open because of infection. The other two patients who stayed for 05 days had multiple sinuses requiring extensive dissection with post-operative pain. In the open

excision group majority of the patients stayed in hospital for five or more than five days in order to have daily dressing and lavage of the wound. In this study, it was observed that the postoperative hospital stay was not related to the extent of disease, but was related to the type of operation, those who needed daily dressing with lavage stayed longer than those treated by the Karydakis technique.

Table 4: Hospital stay (Days) (n=30)

Technique	Karydakis group	Open excision group
0-2 days	08	00
3-5 day	07	11
6-10 day	00	04
Mean (days)	3.27±1.22	4.93± 2.31

Follow-up for recurrence in this study was carried out for a period of 12 months (Table 5). The results of follow-up revealed 0% recurrence in the Karydakis group. Only one patient in this group had wound infection, which was laid open but healed completely with daily dressings. Her biopsy report revealed tuberculosis so she was started on antituberculous treatment for 08 months. Recurrence in the open excision group was noted in 05 patients; this rate of 30% is comparable to figures from other studies published in the literature. Only one female patient of open excision group did not reported for followup after one year.

Table 5: Recurrence rate (n=30)

Technique	No. (% age)
Karydakis Group	0 (0%)
Open excision Group	5 (30%)

DISCUSSION

Pilonidal sinus is a common and very inconvenient entity for the individual suffering from it. It is an unsightly and not an infrequently painful condition. Swelling, discharge and infections are common in this condition, hence surgical intervention at the earliest should be instituted. Although it is not a rare surgical problem, but there is no universal consensus on the best operative procedure and the reported recurrence rate is quite high. Recurrence continues to challenge the general surgeon, despite various techniques like Karydakis, Bascoms and flap plasties. The common principle underlying all these techniques is to obliterate the natal cleft and to place the main wound away from the midline. This principle is aimed to abolish the reservoir of hair and to protect against the entrance of hair.

Pilonidal surgery demands meticulous technique and expertise.The recurrence of pilonidal sinus is an operative failure resulting from faulty technique and to some extent due to ignorance about the exact etiology of the disease. The factors believed to result in recurrence of the disease include: faulty technique, infection, tension in the sutures applied to the skin in case of primary repair, or in the case of Karydakis technique improper lateralization of the main wound. However Karydakis technique is considered to be the best choice as it offers a recurrence rate of one fourth as compared to conventional open excision, without increasing the rate of complications and this has also been shown in this study. The basic principle behind the Karydakis technique is to make a lateral wound in the region of the natal cleft with obliteration of the natal cleft. This is achieved without creating tension on the skin sutures by stitching the underlying subcutaneous fat to the presacral fascia with absorbable vicryl sutures.

This study included 30 patients who underwent surgery by two different techniques, the most common age group affected was between 20 to 30 years with the mean age of 28 years. In our study the peak incidence of the disease was found in the third decade of life and since the selection of patients for either group was random the age difference found in both the groups was almost identical. Male to female ratio according to most of the studies is 3:1; however in this study the ratio was 9:1 and the percentage of females in this study was 10%. This may represent that either females in our set up do not present themselves because of shyness or maybe the incidence of the disease is lower in them. There is need for further research to assertain this point.

The duration of operation in both groups was studied and found to vary significantly, the mean operating time taken in Karydakis technique was 45.7 minutes where as in case of open excision it was 25 minutes. Similarly post-operative hospital stay was considered in days and was found that in the Karydakis group the mean stay was 3.27 days while in the open excision group the mean stay was 4.93, with a standard deviation of 1.22 and 2.31 respectively. No recurrence was found in the Karydakis technique group whereas in the open excision group, recurrence was noted in 5 out of 15 patients. The percentage was thus 0% and 30% respectively. The Pearson chi-square value was 9.130 with a degree of freedom of one and the calculated P value turned out to be 0.003, which is less than the standard P value of 0.05. The student t test was positive; hence the test was significant indicating that there is a significant difference in the recurrence rate of pilonidal sinus in the two groups.

CONCLUSION

The results of conventional operations on pilonidal sinus remained unsatisfactory with significant morbidity and high recurrence. Hence the search for an ideal operation continues. This study has shown good results with Karydakis technique of asymmetrical primary closure with the advantage of shorter hospital stay, thus minimizing hospital expenses and early return to normal life. Although it is a relatively new technique, it has proved to be effective in terms of very low recurrence and minimum post-operative care/management, as compared to the open excision technique. In our opinion Karydakis technique is safe, easily applicable and acceptable to most patients. It should be preferred to all other techniques available for the treatment of pilonidal sinus because of its very low complication and nil recurrence rate.

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