COMPARISON BETWEEN PRIMARY CLOSURE WITH KARYDAKIS'S TECHNIQUE VERSUS OPEN PROCEDURE IN TREATMENT OF PILONIDAL SINUS IN TERMS OF FREQUENCY OF POSTOPERATIVE WOUND INFECTION

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ABSTRACT

Objective: The purpose of this study is to compare between primary closure with Karydakis's technique versus open procedure in treatment of pilonidal sinus in terms of frequency of postoperative wound infection.

Study Design: Randomized Clinical Trials (RCT).

Place and Duration of Study: This study was carried out at Department of Surgery, CMH, Kharian over a period of 2 years from Sept 2010 to Oct 2012.

Patients and Methods: Sixty patients were selected out of which 30 patients underwent open excision and secondary healing and 30 patients underwent Karydakis procedure. Post operatively these patients were observed for wound infection on date of discharge and weeks 1, 2 and 3. Results of both groups were compared for wound infection by applying chi-square test.

Results: There was no statistically significant difference in the frequency of infection between the two groups when calculated during the complete course of study.

Conclusion: Primary closure with Karydakis's technique and open procedure are satisfactory surgical procedures for pilonidal sinus disease in terms of post-operative wound infection.

Keywords: Length of stay, Pilonidal sinus, Postoperative complications, Surgical wound infection.

INTRODUCTION

Pilonidal sinus is a disorder of the sacrococcygeal region affecting younger age group from 15 to 30 years especially fat and hairy persons[1]. Spectrum of presentation includes asymptomatic, acute pilonidal abscess, chronic pilonidal sinus or complex/recurrent pilonidal sinus disease[2,3].

Surgery in pilonidal sinus disease is aimed at simplified procedure, minimal post-operative pain, minimal wound care, rapid wound healing, shorter hospital stay, early return to daily activities and low recurrence rate[4,5]. Although various surgical techniques have been developed from open procedure to complex flaps and widely used with variable success rates but no single method is labelled as the ideal treatment[6].

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Many patients develop recurrent and debilitating pilonidal sinus disease because of recurrent infections/abscess formation. If these patients are operated with simple excision and primary midline closure then these patients are most likely to suffer from poor wound healing and recurrence[7]. These patients are candidate for wide local excision with or without flap procedure. Reconstruction of surgical site is required in these cases. These procedures are aimed at excising all the sinuses and pits, flattening of the natal cleft, reduction in hairs and hence reduction of risk of recurrence. Although these procedures unlike wide local excision offers early healing but at the cost of long and extensive operation resulting in long hospital stay[8].

Seroma / haematoma formation, infection, wound dehiscence and flap necrosis are few early and formidable complication of these flap procedures. Various flap procedures available in arsenal of surgeon are the cleft closure method, Karydakis procedure, Kitchen Karydakis procedure, Z plasty, V-Y advancement flap,

Limberg, modified Limberg flap, rhomboid flap and gluteus maximus myocutaneous flap[9].

Open procedure is generally preferred surgical procedure in recurrent disease especially with extensive multiple large sinuses and recurrent disease as it is simple to perform. This study will compare the two widely practiced procedures i.e. secondary healing after open excision and Karydakis procedure. This study will help in better choice of procedure for this chronic disease and also help in reducing the economic burden and morbidity of the disease.

MATERIAL AND METHODS

These randomized controlled trials were carried out at department of surgery, CMH, Kharian over a period of 2 years from Sept 2010 to Oct 2012. All patients of pilonidal sinus disease between 15 to 45 years of age, both males and females, were included in the study. Patient suffering from uncontrolled diabetes mellitus, those who were immunocompromised / immunosuppressed and having acute pilonidal abscess were excluded from study.

After taking permission from hospital ethical committee, a total of 60 patients were included in the study. Patients admitted from OPD and were followed up in wards and OPD of department of surgery and were chosen with consecutive (non-probability) sampling. Patients were randomly and equally allocated into group A and B. The patients of group A underwent open surgical excision with secondary healing (open procedure) while of group B underwent primary closure with Karydakis's technique.

Southampton scoring system was used to analyze and document the infection. In the comparison for infection, the Southampton grade 0 and 1 was regarded as no infection and any grade more than 1 accounted for the presence of infection.

Table-1: Comparison of wound infection between group A and group B.

Wound infection (Southampton score grade)		Group A n=30 n (%)	Group A n=30 n (%)	*p*-value
Day of discharge	Grade 0	14 (46.7%)	16 (53.3%)	0.688
	Grade I	11 (36.7%)	8 (26.7%)	
	Grade II	3 (10.0%)	2 (6.7%)	
	Grade III	2 (6.7%)	4 (13.3%)	
1st week / day 7	Grade 0	19 (63.3%)	19 (63.3%)	0.970
	Grade I	6 (20.0%)	6 (20.0%)	
	Grade II	3 (10.0%)	2 (6.7%)	
	Grade III	1 (3.33%)	2 (6.7%)	
	Grade IV	1 (3.3%)	1 (3.3%)	
2nd week / day 14	Grade 0	25 (83.3%)	25 (83.3%)	0.753
	Grade I	3 (10.0%)	2 (6.7%)	
	Grade II	2 (6.7%)	2 (6.7%)	
	Grade III	0 (0.0%)	1 (3.3%)	
3rd week / day 21	Grade 0	28 (93.3%)	27 (90.0%)	0.601
	Grade I	2 (6.7%)	2 (6.7%)	
	Grade II	0 (0.0%)	1(3.3%)	

Preoperatively written informed consent was taken and pre-anesthesia assessment was done. In both the groups, treatment procedure was explained to the patients in the language that they understood. Patients were operated in prone position under general anesthesia.

1. **Karydakis procedure:** Karydakis flap is a type of primary repair of the wound, after complete excision of sacral pilonidal cyst with characteristics
   a) Lateralization of final scar.
   b) Flattening of natal cleft.
2. **Open procedure:** Wide excision of the pilonidal pits and sinus tracts is done with healing by secondary intention.

Dry dressing was done after operation for 48 hours and wound was examined for swelling, redness and discharge (signs of surgical site infection). Subsequent dressing was done daily. All patients were followed up on weekly basis and on each follow up patients were examined for swelling, redness and discharge from wound (signs of infection). Stitches were removed on first follow up visit on 14th post-operative day and patients were followed up to 3 weeks.

Demographic information like name, age, gender and address were obtained and entered in pre designed proforma. Telephone contacts of patients were obtained to ensure follow-up. Patients were assessed at post-operatively on day of discharge, day 7, 14 and 21 and infection was assessed as per Southampton scoring system on each follow up. The bias was tried to be minimized by obtaining southampton scoring system by two different doctors.

All the collected data was entered in SPSS version 16.0 and the two groups were compared for wound infection. Quantitative variable like age was described in terms of mean and standard deviation (SD). Qualitative variables were described with frequency and percentages. Both groups were compared for wound infection by applying chi-square test. Independent sample t-test was applied for quantitative variables. *p* value < 0.05 was considered statistically significant.

RESULTS

The age distribution ranged from 15-36 years in the study. Mean age in group A was 24.87 years (SD = 4.485) and in group B, it was 24.10 years (SD = 5.047).(*p*=0.151). Group wise gender distribution is summarized in Figure-1.

In group A mean weight was 76.03 Kg (SD = 7.024) and in group B mean weight was 73.53 kg (SD =12.339). (*p*= 0.69).

On day of discharge, there were 5 (16.7%) patients in group A who got wound infection as compared with 6 (20.0%) patients in group B as per Southampton score system. By the 7th day post operatively, therewere 5 (16.7%) patients in group A who had wound infection as compared with 5 (16.7%) patients in group B. On 14th postoperative day, there were 2 (6.7%) patients in group A who had wound infection as compared with 3 (10%) patients in group B. Whereas on 21st postoperative day,there was no patient (0%) in group A who had infection as compared with 1 (3.3%) patient in group B who got wound infection. The groups did not have a statistically significant difference in the frequency of wound infection during the follow-up period.

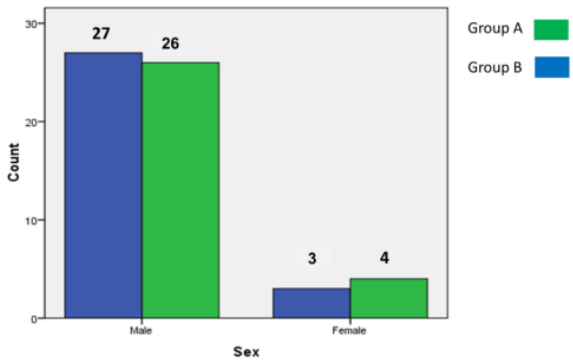

Figure-1: Gender distribution between group A and group B (*p* value = 1.000).

DISCUSSION

The published studies as far as 2011[10] suggest that there is still some controversy regarding the best method for treatment of pilonidal sinus disease. It is universal agreement in the published literature that on pathological basis sacrococcygeal sinus disease is an acquired condition[11]. There is a long list of surgical procedures that are advocated for the treatment of chronic pilonidal sinus disease. These procedures range from a total conservative

treatment and non-surgical approach to extensive surgical procedures involving extensive full thickness flaps techniques[12] but despite this broad range of surgical armament the ideal treatment of pilonidal sinus disease remains a topic of debate and controversy. The ideal surgery should be simple, a low recurrence rate, a short hospital stay associated with minimum pain and wound healing problems and it should have less economic burden on system and patient as well[13]. Despite extensive research there are still no perfect surgical procedures for pilonidal sinus with respect to the results of early and late complications[13].

Primary aim of the treatment in pilonidal sinus disease is to heal the sinus satisfactorily, as soon as possible either by open healing method or by primary closure, and to avoid early complications and the risk of recurrence.

There was a male predominance in our study. Out of total 60 patients 88.3% were males and 11.7% females almost same as described in other studies except in one study where Memon et al showed a female preponderance in their study[14]. The poor representation of female patients has also been noticed in our study. This may be the cause of the relatively low incidence of pilonidal sinus disease in females as females are less hirsute.

Most patients were younger patient with mean age of 24.4 ± 4.7 years. Almost same results were shown in other studies. Jamal A et al[15] showed mean age of 26.4 ± 5.0 years (range 18-40) and Al-Salamah SM et al[16] showed mean age of 22.6 ± 6.2 years. However contrary to our study Dudink R et al showed mean age of 29 ± 10.7[10].

Wound infection were 16.7% in open procedure and 20% in Karydakis procedure. This in contrast to 8.5% stated by original Karydakis pilot study[17] comparing 6545 cases and 4% as stated by Kitchen[18] in his study using Karydakis technique. Infection rate was also shown in a local study by Aamir M[19] stating 16.7% early complication rates and 24% overall complications rate with Karydakis technique.

Sondenaa K et al compared open healing with primary closure. In this study he showed infection rate of 27% and 38% with these techniques. Closure after excision caused 18% infection rate with open healing in comparison to open healing which caused 13% infection rate. There was only slight difference without much significance. But he concluded that open healing causes longer hospital stay, more frequent hospital visits and longer follow up with long sick leaves[20].

McCallum IJ et al conducted a systemic review and meta-analysis on all studies on pilonidal sinus, in which only five trials (559 participants) assessed the rate of surgical site infection after open healing compared with primary closure (all techniques) in 2008. Although infection rates were somewhat higher after open healing but it does not exposed any statistical significance. In a study comparing open healing with Z-plasty, there was a likewise no considerable increase in infection rate after open healing. Wound infection rates were low generally whichever surgical technique is used except for two studies which revealed slightly higher rates with open healing up 22%.

They concluded that evidence suggested more rapid healing after primary closure though there was no significant difference in the wound infection rate after wound closure." No clear benefit was shown for surgical management by primary closure or open healing by secondary intention". A clear benefit was shown for off-midline closure rather than midline closure after pilonidal sinus surgery. Off-midline closure (like Karydakis Procedure) should be the standard management when primary closure is the desired surgical option[21].

In an updated version Al-Khamis A et al compared 26 trails and 2530 patients and concluded that no clear benefit was shown for open healing over surgical closure[22].

CONCLUSION

Post operatively wound infection rates in patients who underwent open procedure were

16.7% as compared with 20.0% in patients who underwent Karydakis procedure during the course of study. The groups did not have a statistically significant difference in the frequency of wound infection.

Our results are comparable to international and national studies and did not show large difference in the results between the two groups.

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