Outcomes of Karydakis Flap versus Modified Bascom Technique in Treatment of Pilonidal Sinus Disease

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Abstract

Background: Pilonidal sinus disease is a common surgical concern for 20- and 30-year-old males. Surgery is the most acceptable management. Surgical recurrence and wound infections are rare especially with Wide excision. It leaves a large midline incision that takes months to heal and may lower quality of life. The optimal therapy is debatable. Karydakis flap and Modified Bascom are two promising surgical techniques.

Objectives: The aim of this study is to evaluate early postoperative outcomes and satisfaction of patients with Pilonidal Sinus (PNS) who underwent either Karydakis flap or Modified Bascom Cleft Lift Procedure at our Department.

Patients and methods: From March 2022 to January 2023, Qena University Hospitals, South Valley University performed a randomized control experiment on 60 pilonidal sinus patients. Metronidazole was administered intravenously before 30 min and after 6 h of all spinal anaesthetic surgeries.

Results: The Karydakis group had a greater rate of infection occurrence than the Modified Bascom group (P = 0.0237), but there was no difference in drain removal, hospital stay, post-operative discomfort, or pain. Modified Bascom group required significantly longer time for painless defecation than Karydakis group (P = 0.01773). Both research groups had good to excellent post-operative patient satisfaction.

Conclusion: Both methods are effective in management of Pilonidal Sinus with no huge distinction. Modified Bascom Technique has a lower risk of infection. However, Karydakis Flap was better to achieve painless defecation in a shorter period of time.

Keywords: Karydakis Flap; Modified Bascom; Pilonidal Sinus; Management; Outcomes.

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Introduction

Pilonidal sinusitis is a common surgical problem that affects young men in their twenties and thirties. It was formerly thought to be a congenital ailment, but it has recently been demonstrated to be an acquired disorder **(Banerjee et al., 2023).** The illness is most typically noticed as a recurrent inflammation of the skin in the buttock crease. It is quite common among young military recruits, impacting 26 out of every 100,000 **(El Hadidi et al., 2019).**

In spite of the fact that several surgical methods for treating pilonidal sinus have been described, the question of which treatment is the most effective is still being debated. A good therapy should be straightforward and uncomplicated to administer, provide sufficient postoperative patient comfort, have a low incidence of complications, make it possible for patients to return to work quickly, and have a low risk of recurrence **(Mahmood et al., 2020).** Despite the fact that there are a number of pharmaceutical and surgical techniques available, ranging from the application of phenol to sophisticated advancement flaps, the best therapeutic option has not yet been identified because to the considerable complication and recurrence rates **(Bi et al., 2020).**

There have also been other ways of off-midline surgical treatment reported. One of these is the Bascom cleft lift surgery **(Immerman, 2021).** The Modified Bascom technique is a more involved surgical procedure that necessitates a larger incision in the affected area as well as the removal of the cyst or abscess **(Bhama & Davis, 2022).** Sutures are used to seal the leftover incision. This method was created to deal with procedures that did not heal properly or when symptoms returned **(Banoth & Venkatesh; LIU et al., 2019).**

The aim of this study is to evaluate early postoperative outcomes and satisfaction of patients with pilonidal sinus who underwent either Karydakis flap or Modified Bascom Cleft Lift Procedure at our department.

Patients and methods

This was a randomized control trial that was conducted at Qena University Hospitals, South Valley University on 60 cases with pilonidal sinus from March 2022 to January 2023.

Participants were randomly assigned to one of the groups using a computer-generated randomization schedule. The randomization schedule was generated by an independent statistician, and the allocation was concealed from the investigators and participants until the point of enrollment.

- **Karydakis Flap Group:** Contained 30 patients treated with Karydakis flap technique.
- **Modified Bascom Group:** Contained 30 patients treated with contained patients treated with Technique.

Inclusion criteria: Age: 18-60 years, Patients with pilonidal sinus, American Society of Anesthesiologists (ASA) class I, II, and III and accepting technique.

Exclusion criteria: Patients presenting with acute abscess formation and Malignancy.

Preoperative assessment: All patients had a thorough history, physical examination, and laboratory testing, Local examination of pilonidal sinus and MRI was performed in cases with recurrence or with multiple opening.

Operative technique: The procedures were performed while the patients were anaesthetized spinally.

Before the surgery, the hair is clipped. 10% povidone-iodine was used to clean the operative side. Cefazolin 2 gm was administered intravenously 30 minutes before surgery and again 6 hours afterwards.

Karydakis Flap technique (George & Mathew, 2020): The procedure began with the application of the jack-knife stance, followed by the injection of one millilitre of methylene blue into the external orifice of each pilonidal sinus, without applying any pressure. To lateralize the natal cleft, the Karydakis flap technique was used. In order to do this, the natal cleft had to be excised in the form of an ellipse, the flap had to be mobilized from the wound's median side, and it had to be sutured to the wound's lateral side. Both the top and bottom points of the ellipses were placed two centimetres to the side of the midline.

After an injection of methylene blue, a secondary opening and palpation were conducted done in order to identify the optimal side for the Karydakis flap. Excision was performed on the side of the secondary sinus opening or sinus fluctuation. From the gluteal fascia to the lateral border of the incision, the flap was stitched with interrupted Vicryl 0/0 sutures. This was done in order to close the wound.

After utilizing interrupted Vicryl 2/0 and 3/0 sutures to close the subcutaneous tissue, a suction silicone drain was introduced into the ensuing dead space. This gap was then dragged out far laterally before the subcutaneous sutures were performed, (**Fig.1-3**).

Fig.1. An asymmetric elliptical excision was performed.

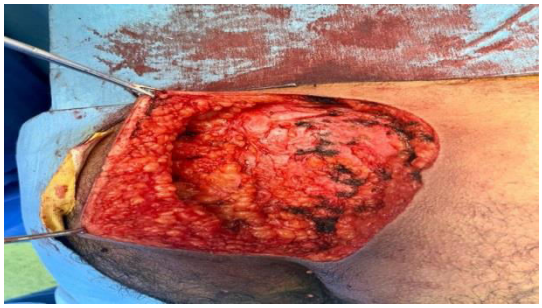

Fig.2. Following an elliptical resection of the natal cleft, the flap was mobilized from the wound's median side.

Fig.3. 2 cm lateral to the midline Karydakis flap, especially at the lower end

Modified Bascom Technique (Hatch et al., 2020): Prior to surgery, the patient was instructed to stand near the bed. Using a permanent felt-tipped pen, a line was drawn on each buttock at the point where the surface skin dipped into the abyss. If the incision extended towards the anus, it was turned to the left when it neared the defect's terminal, and then returned to the anus side.

After that, an examination of the outside line of contact between the buttocks was carried out. An incision was created on the side of the sinus entry, 1-2 mm from the border, and it was wrapped around the anus. This procedure began two centimetres laterally of the midline. In order to promote a tension-free early healing of the breach away from the midline, the skin on one side of the birth cleft was tugged and removed while the skin on the other side was undermined. The abscess chamber was then curetted or cleaned with gauze, and absorbable (2/0 polyglactin) sutures were used to resemble natal cleft adipose tissue. Thereafter, the abscess was drained.

Sutures made of 3-0 polypropylene interrupted mattress were used in order to seal the wound. Patients had a new wound dressing applied to their wounds every other day, but after the drain was removed, no further wound dressing was applied. When there was less than 20 milliliters of effluent, the suction drain had to be emptied every twenty-four hours. After surgery, patients had their sutures removed between 12 and 14 days later, and they were all monitored for postoperative complications (**Fig.4-6**).

Fig.4. 1-2 mm incision was made on the side of the sinus entrance, wrapping around the anus.

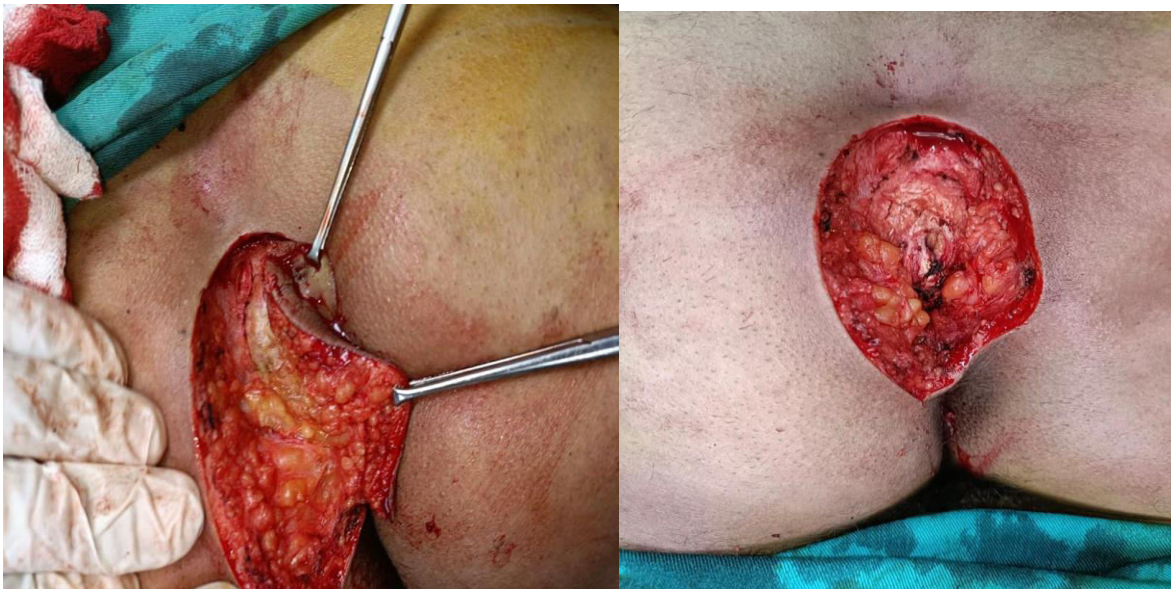

Fig.5. After that, the skin on one side of the birth cleft was pulled and removed.

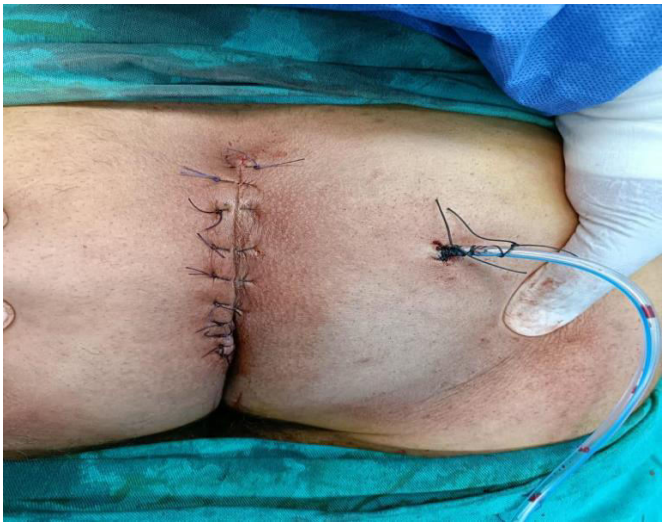

Fig.6. To close the incision, 3-0 polypropylene interrupted mattress sutures were utilized.

Postoperative evaluation

- **Pain (Vas score):** Pain was evaluated based on the visual analogue scale **(McCormack et al., 1988)** in the 1st, 3rd and 5th day.
- **Post operative complication rate** including Seroma, Hematoma, Dehiscence, Wound infection and Recurrence.
- **Post operative follow up data** including Sit without pain, Painless Defecation, Time to first mobilization, Duration of incapacity for work and tie required for Complete healing.

At the end of follow up patients' satisfaction was evaluated.

Ethical Approval: Prior to conducting the study, the South Valley University Ethics Board approved it, and all participants provided informed written consent. The investigation followed the International Medical Association's Code of Ethics for Human Research (Declaration of Helsinki). This

study was approved according to code: SVU-MED-SUR011-1-22-3-347.

Statistical Analysis

Data analysis was performed using IBM-SPSS version 24 (May 2016). To assess statistical significance, we conducted the Kristall-Wallis and Wilcoxon tests, as well as Spearman's correlation and logistic regression analysis. Each variable was analyzed based on the type of data it contained (parametric or non-parametric). We considered the findings statistically significant (at the five percent level) when the P-values were less than 0.05.

Results

There were no statistically significant differences between the two research groups in terms of age, gender, BMI, duration of symptoms, or recurrent sinusitis.

Midline multiple sinuses was significantly increased in Karydakis group cases and Midline single sinus was significantly increased in Modified Bascom group cases (P = 0.00067), (**Table.1**).

Table 1. Basal characteristics of included subjects in both study groups.

Variables	Karydakis group (N = 30)	Modified Bascom group (N = 30)	P. Value
Age (Years)	28.4 ± 6.14	29.67 ± 5.22	0.3929[t]
Sex			
• **Male**	20 (66.67%)	18 (60%)	0.592[x]
• **Female**	10 (33.33%)	12 (40%)	
BMI (Kg/m^2)	22.5 ± 1.8	22.47 ± 2.27	0.94992[t]
Morbidities	0 (0%)	0 (0%)	-
Duration of Symptoms (Years)	2.07 ± 1.31	1.9 ± 1.21	0.61132[t]
Recurrent Sinus	6 (20%)	9 (30%)	0.371[x]
Sinus Location			
• **Midline single**	6 (20%)	19 (63.33%)	0.00067*[x]
• **Midline multiple**	24 (80%)	11 (36.67%)	

*P<0.05 statistically significant
[t]: T. Test | [X]Chi-Square Test
BMI: Basal Metabolic Index

There was no significant difference between the two experimental groups in either the time it took to have the drain removed or the total number of days spent in the hospital. There was not a significant difference between the Karydakis group and the Modified Bascom group in terms of Sit without pain, Time to Initial Mobilization, Length of Incapacity for Work, or Time to Complete Healing. These are all measures of recovery. There was significant increase in duration needed for Painless Defecation in Modified Bascom group compared to Karydakis group (P = 0.01773), (**Table.2**).

Table 2. Post operative evaluations.

Variables	Karydakis group (N = 30)	Modified Bascom group (N = 30)	P. Value
Drain removed (Day)	12.7 ± 2.6	13.77 ± 1.61	0.06123 [t]
Length of hospital stay (Day)	3.2 ± 0.76	2.83 ± 0.87	0.08849 [t]
Post operative complications			
• **Seroma**	12 (40%)	9 (30%)	0.4168 [x]
• **Hematoma**	6 (20%)	9 (30%)	0.3711[x]
• **Dehiscence**	6 (20%)	3 (10%)	0.2781[x]
• **Wound infection**	6 (20%)	0	0.0237*[f]
Sit without pain (Day)	3.67 ± 4.27	5 ± 1.6	0.11459[t]
Painless Defecation (Day)	5 ± 3.78	6.93 ± 2.13	0.01773*[t]
Time to first mobilization (Day)	1.17 ± 0.38	1.07 ± 0.25	0.2347[t]
Duration of incapacity for work (Day)	13.8 ± 3.73	15.1 ± 2.43	0.11477[t]
Completely healed (Day)	15.93 ± 2.61	16.77 ± 2.64	0.2236[t]

*P<0.05 statistically significant
[t]: T. Test | [X]Chi-Square Test | [f]: Ficher Exact test

There was no significant difference between Karydakis group and Modified Bascom group regarding VAS score Pain intensity recorded in 1st, 3rd and 5th days. However, Karydakis method was associated with higher VAS score. There was no statistically significant difference between the two study groups in terms of seroma, hematoma, or dehiscence. Wound infection was much more common in the Karydakis group than in the Modified Bascom group (P = 0.0237). In all study groups, post-operative patient satisfaction ranged from good to excellent, with no significant difference between the two groups, (**Table.3**).

Table.3. Post operative pain, complications, and satisfaction

Variables	Karydakis group (N = 30)	Modified Bascom group (N = 30)	P. Value
Post operative pain (VAS score)			
• **1st day**	1.03 ± 2.17	0.7 ± 2.14	0.5514[t]
• **3rd day**	0.67 ± 1.45	0.53 ± 1.63	0.73912[t]
• **5th day**	0.4 ± 0.93	0.77 ± 1.3	0.21543[t]
Post operative complications			
• **Seroma**	12 (40%)	9 (30%)	0.4168 [x]
• **Hematoma**	6 (20%)	9 (30%)	0.3711[x]
• **Dehiscence**	6 (20%)	3 (10%)	0.2781[x]
• **Wound infection**	6 (20%)	0	0.0237*[f]
Post operative satisfaction			
• **Good**	12 (40%)	6 (20%)	0.09097[x]
• **Excellent**	18 (60%)	24 (80%)	

*P<0.05 statistically significant
[t]: T. Test | [X]Chi-Square Test

Discussion

PS disease is a prevalent chronic inflammatory disorder that mostly affects young adult men **(Calisir & Ece, 2021).** The Karydakis flap and the Modified Bascom Cleft Lift Surgery are two of the most common treatments for pilonidal sinus problems. Both of these procedures are surgical procedures **(LIU et al., 2019; Gavriilidis & Bota, 2019).**

Our research found no statistically significant variations in the baseline features of either of the two study groups, with the exception of the location of the sinuses.

Our findings were supported by **(Calisir & Ece, 2021).** There were 124 participants in the research. The patients' average age was 25.33 ± 6.72 years, with 7 females (5.65%) and 117 males (94.35%). When comparing the groups based on the characteristics they already had before the commencement of the research, there was not a difference that could be considered statistically significant between them.

Nevertheless, our results contradicted those of **(Mikail & ACEHAN, 2022),** who stated that the Karydakis Flaps group had a lower mean age (p=0.019). There was no discernible difference between the two groups in terms of the other measurements taken at the beginning of the study.

According to the findings of our research, there was no discernible difference between the two study groups in terms of the length of time that patients had symptoms. Our results were in line with **(Tokac et al., 2015).** Nevertheless, these results contrasted those of **(Bostanoglu et al., 2010),** who discovered that those treated with the Karydakis approach experienced symptoms that persisted for a longer period of time.

Fatima et al. (2020) revealed that 56 of 117 patients who underwent the Karydakis Flap procedure had multiple openings. Our results mirrored those of **(Fatima et al., 2020),** who found the same thing.

Nevertheless, our results contrasted those of **(Sakr et al., 2006),** who stated that the majority of patients in both groups had multiple sinus openings, and there was no statistically significant difference between the two groups in terms of the number of openings present.

Our results were comparable to those of previous studies **(Alvandipour et al., 2019),** both in terms of the length of time it took to remove the drain (days) and the number of days spent in the hospital **(Alvandipour et al., 2019) (Ahmed et al. 2017).**

The incidence of seroma, hematoma, or dehiscence did not vary significantly between the two research groups in our study.

Our results were consistent with those of **(Demiryas & Donmez, 2019),** who found no statistically significant differences in seroma, hematoma, or dehiscence between the two study groups. Similar results have been reported by **(Mikail & Acehan, 2022)**

The results of **Cantay and Dademr, 2021**, however, which demonstrated a statistically significant difference in treatment techniques in terms of outcomes such as seroma, hematoma, and dehiscence development, were in contrast to the findings of our study, which showed that there was no such difference.

Wound infection was much more common in the Karydakis group than in the Modified Bascom group (P = 0.0237).

Our results contrasted those of **(Cantay & Dademr, 2021),** who found that wound site infection rates in the Karydakis Flap were much lower than in other surgical methods for sacrococcygeal pilonidal sinus treatment. This is a result of the use of appropriate surgical procedures as well as post-operative care.

In the current study, there was no significant difference found between the Karydakis and Modified Bascom groups in terms of Sit without pain (P = 0.11459), Time to first mobilisation (P = 0.2347), Length of incapacity for work (P = 0.11477), or Duration required for complete healing (P = 0.2236). Despite this, the Modified Bascom group needed considerably longer time than the Karydakis group for painless defecation (P = 0.01773).

Changes in the surgical methods and the amount of tissue removed are probably to blame for the disparity in the amount of time that patients in the Modified Bascom group were able to defecate without experiencing any discomfort. The Modified Bascom procedure requires a larger sinus excision, which results in a longer healing time and, most likely, greater discomfort during defecation. In contrast, the therapy known as the Karydakis flap involves making a smaller incision while preserving the tissue that is immediately around the affected area. This results in a quicker healing time and less pain while defecating **(Favuzza et al., 2015; Zaitoun et al., 2022).**

This disagrees with **Ersoy et al., (2009)** who reported that defecation was performed more difficult after the Karydakis and it took longer duration needed for Painless Defecation. They stated two ways to explain the significant difficulty with defecation in the Karydakis group in their study: first, although they could not find any studies concerning the tension of the flaps, the tension of the Karydakis flap seems higher for geometrical reasons. The tension is shared by three edges in the Limberg flap where as there is one edge in the Karydakis flap. Second, the questioning concerned only the first defecation in all patients. The higher incidence of infection could be a probable reason for the higher rate of difficulty in defecation in the Karydakis group.

There was no statistically significant difference between the two groups in terms of post-operative patient satisfaction, which ranged from good to excellent in all of the study groups.

According to **Moran et al. (2011),** patients who had Karydakis surgery reported an overall satisfaction rating of 92%, which is consistent with our results.

In addition, we agreed with **(Svarre et al., 2022)** when they said that the Modified Bascom approach was associated with excellent levels of patient satisfaction as well as great short-term outcomes.

Conclusion

Both methods are effective in management of Pilonidal Sinus with no huge distinction. Modified Bascom Technique has a lower risk of infection. However, Karydakis Flap was better to achieve painless defecation in a shorter period of time.

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