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Modified Sinotomy with Marsuplization versus Excision with Lay Open in Treatment of Pilonidal Sinus Disease

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Abstract: Pilonidal sinus disease (PSD) is a common infection of the skin in the gluteal cleft, with a prevalence of 0.7% in the general population. Pilonidal sinus can occur in many different areas of the body but most are found in the sacrococcygeal area, in the natal cleft, approximately 5 cm from the anus. This is a prospective comparative randomized study conducted at Department of General Surgery, Imbaba General Hospital to compare the modified sinotomy with marsupialization versus excision with lay open in treatment of pilonidal sinus disease. Pre-study power analysis revealed that a sample size of 30 patients in each group would be sufficient with 80% power and a P value of 0.05. The perfect approach for the management of PNS should be simple, cause minimal pain, have best chance for success and least recurrence rate with low risk for complications, avoid general anesthesia, require minimal wound care, and ensure minimal inconvenience for the patient with rapid return to normal activity. Number of Patients participated in this study were n=60, 77% of the participants were males aged from 17-52 and 26.3 works as drivers. Operative time in modified sinotomy group ranged from 20-40 minutes and in lay open group ranged from 20-35 min (P-value: 0.07). Presence of hair in the back in the modified sinotomy group in 83.3% while in the lay open group 76.6% (P-value: 0.004). **In conclusion,** we believe that execution of a minimally invasive surgical technique for PSD can be among the most important methods for treating not only primary PSD but also complicated and recurrent PSD cases.

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Introduction:

Pilonidal sinus disease (PSD) is an infection of the skin in the gluteal cleft, with a incidence of 0.7% in the general population, mostly affecting males (male to female ratio: 4:1) between the ages of 15 and 38 years with exceptional occurrence before puberty or after the age of 60[1].

The natal cleft is maintained because the thin midline skin is attached to the underlying ligamentous and aponeurotic fibers on the dorsum of the sacrum and coccyx by a dense well defined and highly collagenous fascia. Natal cleft fascia bifurcates above the left layer deviating more rapidly than the right. [2, 3].

The disease was initially thought to be congenital, due to the failure of fusion in the dorsal midline resulting in entrapment of hair follicles in the sacrococcygeal region; however, more recent research strongly favors an acquired etiology. The etiology of this disease is not fully understood, some are believed to be congenital in origin, and some consider it an acquired disease and the reason to this is that this condition can be seen in folds between the fingers of hairdressers and shepherds and dog trainers which can be due to the penetration of the hair as a foreign body and cause reactions in the subcutaneous tissue[3].

Patients either may be asymptomatic 78% are the two most frequent presenting symptoms. Pilonidal sinus disease may present as asymptomatic, acute, chronic or recurrent condition. Recurrence rate of pilonidal sinus varies depending on treatment, method and length of follow up, but or may present with acute pilonidal abscess, chronic fistula form, or a recurrent, complex pilonidal sinus disease[4]. The perfect approach for the management of PNS should be simple, cause minimal pain, have best chance for success and least recurrence rate with low risk for complications, avoid general anesthesia, require minimal wound care, and ensure minimal inconvenience for the patient with rapid return to normal activity[5]. The identification of a single treatment approach for PSD has proved to be

challenging because of the heterogeneous nature of clinical presentations in cases of PSD. Therefore, a more feasible approach may be to identify strategies for "the best management" rather than "the best technique" in future clinical studies[6].

Methods:

This is a prospective comparative randomized study conducted at Department of General Surgery, Ain shams university & Imbaba General Hospital to compare the modified sinotomy with marsupialization versus excision with lay open in treatment of pilonidal sinus disease. After obtaining approval from local ethical committee and after fully informed written consent signed by the patient.

Inclusion criteria:

- Patients with chronic and limited sinus and less than four years history of disease.
- Age from 15 to 60, males and females.

Exclusion criteria:

- Patients with infected pilonidal sinus.
- Patients with recurrent disease.

Patients are divided into two groups:

Group A consisted of 30 patients will be managed by modified sinotomy with marsupialization.

Group B consisted of 30 patients will be managed by total excision with lay open.

Following the initial evaluation, all eligible patients will be asked to give informed consent to participate. All patients will be prospectively followed until complete healing (maximum 7 weeks in our study).

Patients are examined for signs of inflammation; redness, hotness, tenderness and presence of previous midline or lateral scars. Patients are also examined for anal discharge and for systemic signs of infection.

Group A: modified sinotomy with marsupialization.

A vertical incision (interrupted line) is made in the midline connecting all the openings. Curettage of the sinus floor. Partial excision of the lateral sinus wall and the skin edges with a 45° angle using a scalpel. Marsupialization by approximating the skin edges and the upper margin of the fibrous boundary of the sinus cavity with interrupted sutures. The sinus floor rises while the skin edges become depressed; consequently, the wound cavity diminishes and the healing time is shortened.

Group B: Managed by total excision with lay open. After identification of the main sinus orifice, it was probed and the main tract was totally excised. Any cysts or hair tufts were removed, followed by curettage of the infected granulation tissue and debris

Antibiotics and analgesics were needed for both groups postoperatively for 5 days followed by administration of analgesics on demand.

All patients were followed every other day for one week, then weekly until complete healing, then monthly for six months. Removal of sutures was done at 2–3 weeks. If there were any wound complications, sutures were removed and the wound was dealt with as the open method until complete healing. If no healing occurred despite careful wound dressing, this was considered as healing failure. Disease recurrence was considered after the disease free interval following complete healing.

All patients were followed up until healing to evaluate the outcome as regard response to specific therapy and recurrence for 1 year.

Statistical analysis:

Using SPSS program (V.25) for Data analysis and management of the data. Univariate analysis of demographic and clinical laboratory was accomplished using one-way analysis of variance (ANOVA) to estimate the significance of different between groups where appropriate. Unpaired t-test was used to analyze univariate analysis when appropriate. Chi square (X^2) test were used for categorical data comparison. Numerical variables were divided by 1 SDs for standardization. The difference between groups was considered significant when $P<0.05$. Paired sample t-tests were used to test differences in the whole sample. Furthermore, paired sample *t*-tests were used to assess the differences before and after the surgery, separately, and in the modified sinotomy group and lay open group. The operative time and hospital stay were also assessed.

Results:

Number of Patients participated in this study were n=60.

77% of the participants were males (Figure 1) aged from 17-52 and 26.3 works as drivers.

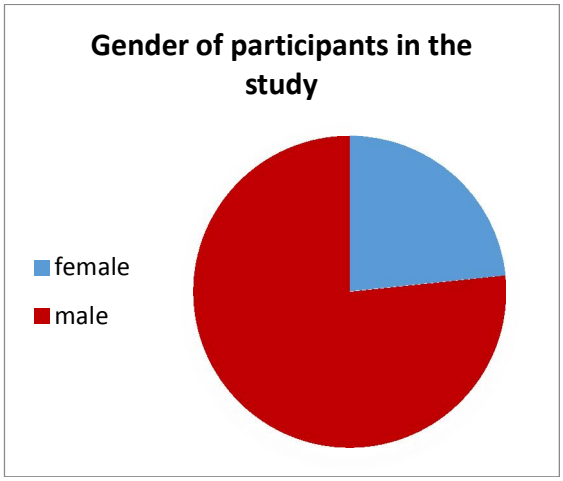

Figure (1): Gender of participants in the study.

Table 1 and table 2 describe the characteristics of every group and the variables compared in this study.

Operative time in modified sinotomy group ranged from 20-40 minutes and in lay open group ranged from 20-35 min (P-value: 0.07)-Figure 2.

Presence of hair in the back in the modified sinotomy group in 83.3% while in the lay open group 76.6% (P-value: 0.004).

Table 3 illustrate the post-operative pain in both groups and pain level assessed by scale (mild-moderate-severe).

Modified sinotomy group:

Table (1): Descriptive Statistics

	Minimum	Maximum	Mean	SD
Age	17	52	32.23	10.170
BMI	19	27	24.10	1.971
operative time (minutes)	20	40	29.17	4.170
hospital stay	1	2	1.03	.183
Scar (wound length)	6	12	8.07	1.437
Time to return to work in weeks	2	6	3.60	.770

Lay open group:

Table (2): Descriptive Statistics

	Minimum	Maximum	Mean	SD
Age	17	42	29.13	7.610
BMI	18	30	24.53	2.945
operative time (minutes)	20	35	27.17	4.292
hospital stay	1	2	1.07	.254
Scar (wound length)	6	20	9.63	3.222
Time to return to work in weeks	6	10	6.77	1.040

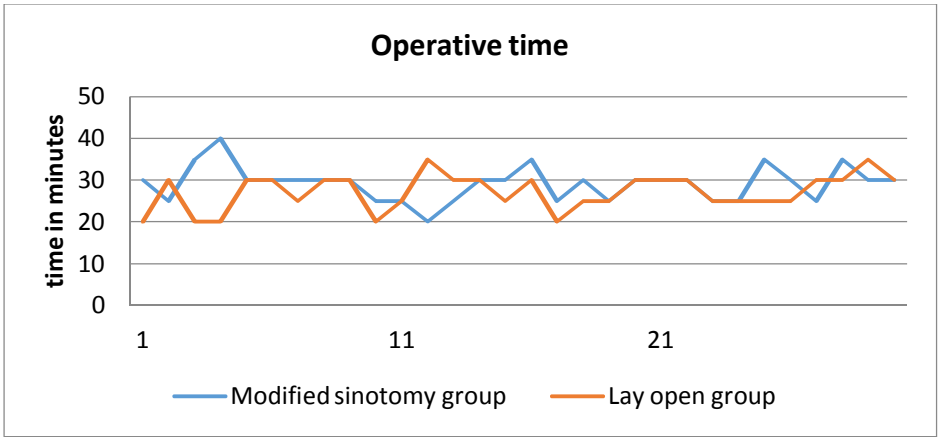

Figure (2): Operative time.

Table (3): Post-operative pain

Lay open V Modified sinotomy	Paired Differences					t	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
				Lower	Upper		
Post op pain mild	.7291975	1.5078910	.2901938	.1326957	1.3256994	2.513	.019*
Post op pain moderate	1.342407	1.412778	.271889	.783531	1.901284	4.937	.000
Post op pain severe	1.4560494	2.2229804	.4278128	.5766676	2.3354311	3.403	.002*

*significant P-value

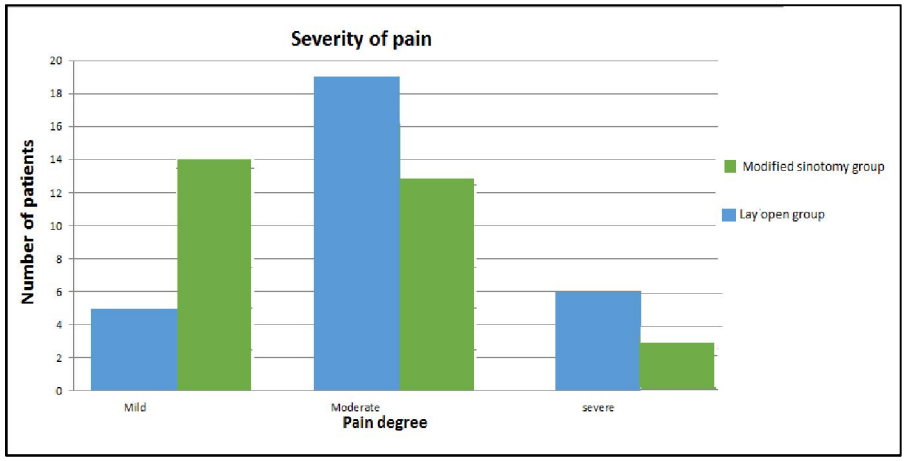

Figure (3): Severity of pain.

Discussion:

Location of the disease process is the best way to confirm the diagnosis of pilonidal disease, although several other diseases should be considered[9].

This disease often affects the groin, axillary, perianal, perineal and inframammary regions. These patients need surgical referral because this condition is likely to be long-term concern [10, 11]. There are several medical treatments for pilonidal sinuses. It is fairly widely agreed that an abscess formed from a pilonidal sinus should undergo surgical treatment with incision and drainage. However, regimens for elective treatment of pilonidal sinuses vary widely[12].

In the present study we compared the modified sinotomy with marsupialization versus excision with lay open in treatment of pilonidal sinus disease.

In The lay open group, the goal is to resect all or part of the infected sinus. Wide excision consists of resection of the totality of the suppuration cavity and the associated pits. The goal is to minimize the risk of recurrence.

In the Modified sinotomy group marsupialization of the tract after excision relies on minimal ‘‘secondary intention’’ healing and short recovery time with minimal postoperative pain. In present study there was no difference in the rate of wound infection; however there was 7% recurrence rate in the modified sinotomy group.

On the other hand, there was a significant difference in time taken to return to work between the two groups in favor of modified sinotomy; those with modified sinotomy had shorter time to return to work than those who had open technique (a mean of 3.6 weeks compared with a mean of 6.7 weeks respectively, P value of <0.0003).

The other difference was in the operative time with modified sinotomy the mean was 29.17 minutes, maximum 40 minutes compared with mean of 27.17minutes, maximum 35 minutes in those with lay open method.

Prophylactic antibiotic use in the surgical treatment of PNS is still controversial. Some authors do not recommend antibiotics in view of the fact that preoperative bacterial isolates, usually anaerobes, in chronic PNSs do not affect the complication rate because bacterial isolates from infected wounds are mostly aerobes.

Conclusion:

The ideal technique for the treatment of sacrococcygeal PS disease is controversial. In the present study we compared the modified sinotomy with marsupialization versus excision with lay open in treatment of pilonidal sinus disease.

There was a significant difference in time taken to return to work between the two groups in favor of modified sinotomy; (a mean of 3.6 weeks compared with a mean of 6.7 weeks respectively) those with modified sinotomy had shorter hospital stay than those who had open technique.

In The lay open group, the goal is to resect all or part of the infected sinus. The goal is to minimize the risk of recurrence. In the present study, there were no cases of recurrence in the lay open group.

In conclusion, we believe that execution of a minimally invasive surgical technique for PSD can be among the most important methods for treating not only primary PSD but also complicated and recurrent PSD cases.

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