

Comparison of Primary Midline Closure and Open Surgery for Sacrococcygeal Pilonidal Sinus: A Retrospective Study

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Abstract:

Background: Sacrococcygeal Pilonidal sinus (SPNS) is a common problem with a variable presentation and many surgical techniques for treatment. Still, there is controversy about the best method of surgery, because of notable rates of recurrence.

Objective: The aim is to clarify the better, cost-effective and less painful method for treating patients having SPNS.

Methods: This is a retrospective study of 119 patients with SPNS, treated by two different surgical methods: group A (69 patients) treated with open surgery and group B (50 patients) treated by primary midline closure. The patients followed for 2 years.

Comparison between the two groups was done, for post-operative complications and recurrence. The data were analyzed using of Statistical Package for Social Science (SPSS) version 21. Chi square used to determine association between variables. P value < 0.05 is regarded statistically significant.

Results: From 119 patients: Group A (69 cases) underwent open surgery and group B (50 cases) had primary closure. Postoperative infection was (5.9%), bleeding (2.5%), scar fissuring (5.9%) and chronic pain (3.4%). Recurrence found in 6 patients (5%); 2(2.9%) in Group A and 4(8%) in Group B.

Conclusions: The open method needs multiple dressings which are costly and painful, longer healing time and may be complicated by scar fissuring, but of lower recurrent and infection. The closed method is preferable for patient's comfort, and it is cost-effectiveness.

Keywords: Pilonidal sinus, Excision, Primary midline closure, Open method, Comparative.

Introduction:

The pilonidal sinus (PNS) disease is a common problem with variable presentation, ranging from asymptomatic to itching and discomfort and soiling of the underwear, to severe pain due to abscess formation⁽¹⁾. PNS affect different parts of the body; the natal cleft is the commonest, called sacrococcygeal PNS (SPNS), though the umbilicus and webs between the fingers of hair dressers may also be involved^(2,3).

Male sex affected more than females and the young age groups are more than the extremes of age and the hairy people are more than the non-hairy⁽²⁾.

There are two theories describing the origin of PNS disease; the congenital theory supported by the presence of the condition in some families, especially those that involve young adolescents, and the acquired theory which postulates that long time driving and sitting are the predisposing cause for

PNS^(4, 5). In acquired theory the healthy hair is to be blamed in the causation of the disease as it penetrates the skin in the natal cleft then sinus formed the tissue react with inflammation against the forging hair then chronic infection, fistula and abscess may form^(6, 7).

The treatment of SPNS aims to fast healing, short hospitalization, patient convenience, early return to normal activities and minimum recurrence rate⁽²⁾. There are many modalities and surgical techniques for treatment of pilonidal sinus disease, non-operative or conservative: fibrin glue as a single modality or in combination with the other surgical procedure⁽⁸⁾, opening the track, wide excision then suturing, limited excision, excision with leaving the wound open, Bascom procedure. There are different ways of flaps to close the defects, like V-Y flap, Limberg's flap and karydakis flap^(2, 7). These techniques aim to flatten the natal cleft sulcus and tension-free closure of the defect⁽⁹⁾.

This study was conducted to compare two different surgical ways after excision of SPNS, Group A; leaving the open wound to heal by secondary intention to Group B; primary midline closure of the wound.

Patient and Methods:

A retrospective study of 234 consecutive patients had SPNS, between March 1st, 2015 to March 1st, 2017 at the Sulaimaniyah Teaching Hospital, Soma and Barzi private hospitals, in Sulaimaniyah city. After exclusion of 115 patients 84 patients were having abscesses and the other 31 refused surgery. The remaining 119 patients who underwent open surgery (Group A, n = 69) and primary closure (Group B, n

= 50) as the surgical procedure were included in the study.

The informed consent forms were obtained from all participants. A preformwas designed and included in the study; it contained sociodemographic data (age, gender, and residency) symptoms, signs, body mass index (BMI), Symptoms of presentations, the times of presentations, operative technique, and the complications.

Surgical procedure:

The patients were managed as day case surgery, under spinal or general anaesthesia, depending on the preference of the patient or anaesthesiologist. Single dose intravenous Cefotaxime 1gm given to patients on the operating table. The patients positioned in a prone position. The buttocks were strapped apart by adhesive tapes, then operative areas were shaved with hair clippers and the skin cleaned with (10%) povidone-iodine disinfectant solution. After draping, Probing via the pit (s) of the sinus is performed, figure (1) to determine the direction of the sinus. Then, an excision of the skin around the sinus made. All orifices were included in the excision of the sinus, and then the sinus is radically excised with the diathermy, figure (2). Haemostasis was done reached by electrocautery.

Operative time estimated from the moment incision started until applying the dressing on the operated site.

Follow up of patients done on an outpatient basis after 2 days, monthly basis for 3 months, then when necessary.

The operation completed by two different methods (two groups):

Group A: The wound was laid open after complete wide excision, and then the wound was packed with dry gauze, figure (3) leaving the wound to heal by secondary intention with regular daily dressing with normal saline and povidone iodine (10%) at home or in primary care clinic until the wound healed completely.

Group B: Excision of the tract and midline closure of the wound: A corrugate drain was placed in and was delivered through the lower edge of the incision. The wound was closed using 3 to 4 deeply running sutures obliterating the dead space, by non-absorbable vertical mattress sutures (0 or 2/0 proline), figure (4). The sutures were tied in a way to obliterate the dead space. The drain was removed after 48 hours, with daily changing of the dressing at home, then the sutures removed after 8 to 10 days. Mean day of dressing was 10 days.

The Data collection and analysis: Data were entered into excel sheet then transferred to IBM Statistical Package for the Social Sciences (SPSS program) version 21 for analysis. Chi-square was used for detecting associations between variables. P-value ≤ 0.05 is regarded statistically significant.

The study protocol was approved by the local ethical committee in Sulaimaniyah Medical College.

Results:

From a total of 234 patients presented with SPNS, 163(69.7%) were male and 71(30.3%) were female. Mean age was (22.96 \pm 5.95), ranged from 13 to 45 years. The mean age for males was 24 years and for females was 20.4 years. One hundred fifty-one (64.5%) were from inside Sulaimaniyah city and 83(35.5%) were from outside the city.

Most of the patients were students 96(41%) and less found in shop-keeper 12 (5.1%), as shown in table (1).

The main symptom was pain and found in 163 patients (69.65%), then discharge in 152(64.95%), swelling in 103(44%) and 84 (35.9%) had an abscess at the time of presentation; the details are shown in table (2).

Most of the patients presented within one month of the symptoms, table (3).

Mean operative time was 11 minutes for Group-A and 20 minutes for Group-B. More than the half of the patients had a BMI above normal, table (4).

Mean postoperative wound care and the dressing were 35 days for Group-A and 13 days for Group-B.

Postoperative complications found in 21 patients (17.64%) after follow up for 2 years, with a mean of (17.28 months): infection 7(5.9%), bleeding: 3(2.5%), scar fissuring: 7(5.9%), chronic pain: 4(3.4%). In each complication alone P-value was not significant in both groups. Details of the complications, with a comparison between both open and closed techniques, are shown in table (5).

Post-operative infection, bleeding found more in obese patients, scar fissuring was more in overweight, while chronic pain only found in overweight and obese patients, but with no statistically significant, table (6).

Recurrence found in 6 patients (5%); 2(2.9%) in open surgery and 4(8%) in closed surgery and the P-value was not significant, table (7).

Although the different sexes and jobs had role in aetiology of SPNS, but no effect on the postoperative complications and recurrence; they were statistically non-significant, table (8).

Table (1): Distribution of patient socio demographic characteristic:

Characteristic		No.	Frequency
Gender	Male	163	69.7
	Female	71	30.3
	Total	234	100
Occupation	Student	96	41.0
	Policeman/ soldier	20	8.5
	Worker	39	16.7
	House Wife	22	9.4
	Driver	17	7.3
	Shopkeeper	12	5.1
	Clerk or sanitary work	20	8.5
	Others	8	3.4
	Total	234	100.0

Table (2): Distribution of clinical presentations:

Presentation	Frequency	Percent
Discharge	54	23.1
Swelling	2	0.9
Pain	24	10.3
Discharge & Swelling	4	1.7
Discharge & Pain	42	17.9
Swelling & Pain	45	19.2
Discharge, Swelling, and Pain	52	22.2
Others	11	4.7
Total	234	100

Table (3): Distribution of duration of the symptoms before seeking medical care:

Duration/ in Month	Frequency	%
< 1 Month	98	41.9
1-6 Months	63	26.9
6-12 Months	38	16.2
> 12 Months	35	15.0
Total	234	100.0

Table (4): Association between BMI and surgical techniques:

			Technique		Total	Total %	P- value
			Open	Closed			
BMI	Low Weight	Count	3	2	5		0.482
		%	60.0%	40.0%	100%	4.2%	
	Normal	Count	22	21	43		
		%	51.2%	48.8%	100%	36.13%	
	Over Weight	Count	27	20	47		
		%	57.4%	42.6%	100%	39.5%	
	Obese	Count	17	7	24		
		%	70.8%	29.2%	100%	20.17%	
Total		Count	69	50	119		
		%	58.0%	42.0%	100%		

Table (5): Distribution of complications:

Complications (n.) %	Infection		Bleeding		Scar fissure		Chronic pain		Total
Group A	(3) 4.3	P value; 0.403	(2) 2.9	P value: 0.758	(5) 7.2	P value: 0.458	(4) 5.8	P value: 0.083	(14) 20.2
Group B	(4) 8		(1) 2		(2) 4		(0) 0		(7) 14
Total	(7) 5.9		(3) 2.5		(7) 5.9		(4) 3.4		(21) 17.7

Table (6): Association of post-operative complication in relation with BMI:

Post-operative complications		Infection	Bleeding	Scar fissure	Chronic Pain
BMI Scoring	Low Weight	Count	0	0	0
		%	0.0%	0.0%	0.0%
	Normal	Count	1	1	1
		%	2.3%	2.3%	2.3%
	Over Weight	Count	3	1	6
		%	6.4%	2.1%	12.8%
	Obese	Count	3	1	0
		%	12.5%	4.2%	0.0%
Total		Count	7	3	7
		%	5.9%	2.5%	5.9%
P value			0.36	0.934	0.078
					0.386

Table (7): Distribution of Recurrence:

		Recurrence		Total	P- value
		Yes	No		
Technique	Open	Count	2	67	0.209
		%	2.9%	97.1%	
	Closed	Count	4	46	
		%	8.0%	92.0%	
Total		Count	6	113	
		%	5.0%	95.0%	

Table (8): Distribution of Association between Sex and Complications:

Complications	Sex		Total	P value
	Male	Female		
Infection	6	1	7	0.174
Bleeding	3	0	3	
Scar Fissure	3	4	7	
Pain	4	0	4	
None	69	29	98	
Recurrence	3	3	6	0.225
No recurrence	82	31	113	



Figure (1): Probing the sinus.



Figure (2): excision the sinus.



Figure (3): left the wound open.



Figure (4): Closure of the wound.

Discussion:

Sacrococcygeal pilonidal sinus is a common surgical condition. The incidence of SPNS worldwide is 26/100 000 people⁽¹⁰⁾. In a study: among 50000 students the incidence in male was (1.1%)⁽¹¹⁾. In our study the majority (69.7%) were males (male: female = 7: 3), which is similar to those reported by studies performed by McCallum⁽¹⁰⁾ and a randomized study done in Erbil designed for 77 patients, to study the comparison between the primary closure and open technique after excision of chronic PNS (3:1)⁽¹²⁾, but not like other studies done in India⁽¹³⁾, Pakistan⁽¹⁴⁾ and Saudi Arabia⁽¹⁵⁾. This male predominance is clear in all studies probably due to their hirsute nature, but such wide difference between males in each study may be related to the ethnic group origin of the patient indifferent studies, due to hair characteristics and growth pattern.

The onset of SPNS is rare both before puberty and after the age of 40⁽¹¹⁾. The mean age in our study was 22.96, mainly at the third decade (early adulthood). Earlier age presentation in female than male. This result is similar with the most studies done in Egypt; prospective study to evaluate the results of 150 patients with SPNS treated surgically after planning a score system⁽⁵⁾ and Saudi Arabia; a prospective randomized double-blind control study on 142 patients with PNS to evaluate new technique for treatment with less healing time⁽¹⁶⁾, but this is younger than studies of India and Pakistan (mean age of 28, 27 and 29 years) respectively^(13, 14, 17), this may reflect earlier presentation of the patients in some countries than other countries for patients seeking medical care.

The occupational SPNS risk for a long time is still controversial. It was used to blame car driving, especially Jeep drivers, and sanitary works as predisposing factors. This study found that students are more prone (41%) and in combined with other sanitary works account for about half of the patients and this is near to a study performed by Israel Defense Forces (IDF) Ethical Research Committee⁽¹⁸⁾, but the disease was less observed in drivers (7.3%) and shopkeepers (5.1%).

Body mass index is thought to be one of the predisposing factors for the disease, more than half (59.17%) of patient's BMI in the current study were above normal, and this is more than that found in study done in India⁽¹⁸⁾, but higher than that of Pakistan⁽¹³⁾. We believe that the heavier body weight may aggravate the condition, especially if accompanied by other cofactors like male gender and more body hair density, which may cause more friction and irritation of the area accompanied by sweating in obese patients.

In addition to non-surgical methods, many different surgical approaches have been described for the treatment of Non-abscess chronic SPNS. Till now it is neither easy nor clear to choose the best single method for its management after excision.

Mean operative time was 11 minutes for group A and 20 minutes from Group B. This is clear because the closed group needs suturing after excision and securing bleeding. In fact, these results are same as the study done in Erbil⁽¹²⁾, so far less than other study in Pakistan⁽¹⁴⁾ and Saudi Arabia⁽¹⁵⁾, because of their different definition for operative time, but our study actually agree with all of them in that open method takes

less time than the closed method which is one of the advantages of open method over closed method.

Post-operative wound care time, in (Group A), was 35 days and 13 days for (Group B). This result is similar to another study done in Saudi Arabia⁽¹⁶⁾ and India⁽¹⁷⁾, but less than others in Erbil⁽¹²⁾ and Pakistan⁽¹³⁾. Our study agrees with all these studies in that closed method has faster healing time and this is the advantage of the closed method.

Post-operative complications found in (17.7%) of the patients (Group A; 20.2%, Group B; 14%). This is statistically not significant like the findings of the other study in Pakistan⁽¹³⁾. In each complication separately P-value was not significant in both groups. Postoperative infection is the most common complication⁽¹²⁾. Postoperative infection occurred in (5.9%) of the patients (A; 4.3%, B; 8%), two folds in closed method than open, this is similar to another study done in Turkey⁽¹⁹⁾, but disagree with the study in Pakistan⁽¹³⁾ in which infection was (16.7%).

Postoperative bleeding occurred in (2.5%) of the cases with no difference in both groups. Scar fissure seen in some patients long time after healing (5.9%) as shallow short fissure on the midline of the healed wound, might be caused by direct trauma or direct sitting on hard places, these were treated conservatively with avoiding pressure and dressing. Scar fissures found two folds more in Group A, and this may be explained by larger and wider scar area after complete healing of the wound.

Chronic local pain found in (3.4%) of the patients and all of them were in group A. This is also can be regarded as an advantage for the closed method.

Recurrence found in (5%) of the patients (group A; 2.9 %, group B; 8%) this agree with all other studies in places mentioned before^(5, 10, 12, 13, 14, 16, 17, 19).

This can be regarded as an advantage of the open method.

Conclusion:

Treating of SPNS by open method needs longer healing time, multiple dressings which are costly and painful, and may be complicated by scar fissuring, but of lower infection rate and recurrence. While primary closure method is preferable for patients comfort, and it is cost-effective.

Recommendations:

- 1- More studies to be performed to find the best answer for SPNS management.
- 2-The closed method used if the situation and experience are available.

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