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**The outcome of pilonidal sinus abscess drainage: a comparative study**

**ABSTRACT**

**Backgrounds and aim:** A pilonidal sinus (PNS) is a common condition that affects men mostly especially young adults. The method of treatment of this surgical condition is controversial still. In this regard, we compared the outcomes of interest between excision and drainage of an abscess in PNS patients.

**Methods:** Patients who were diagnosed with PNS abscess and admitted for the treatment between 2019 and 2020 were treated either by excision (n=48) or drainage of abscess (n=30). The patients were followed up for the outcomes of the interest, including infection, pain, discharge, and wound size at the first, third, and sixth months of surgery.

**Results:** The patients who were treated by excision technique had significantly longer operative time compared to patients who were treated by drainage of abscess 9.65 vs. 5.50 min,  $P < 0.0001$ . In addition, they had a longer postoperative hospitalization time, 4.19 vs. 3.43 hours,  $P = 0.0002$ , and required longer time to back to normal activity, 4.69 vs. 4.20 days,  $P = 0.0221$ , respectively. The patients in both groups had similar incidence rates of infection, pain, and discharge at the different periods and similar incidence rates of wound rate at the first month. The patients who were treated by drainage of abscess had significantly higher incidence rates of two and three cm wound size compared to those who were treated by excision. 75.00%,  $P = 0.4287$ , whereas, the patients who were treated by drainage of abscess significantly developed postoperative fever, 16.67% vs. 0.00%,  $P = 0.018$ .

**Conclusions:** The study showed that total excision of pilonidal sinus abscess develop better outcomes of the wound at third and sixth months of operation.

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## Introduction:

A pilonidal sinus (PNS) is a common condition that affects mostly young to middle-aged adult men. The pathogenesis of this disease is unclear. But, there are two arguments for the etiology of this condition, including acquired and congenital ones <sup>1</sup>. The reason for the development of PNS is that the hairs are penetrated the skin of the natal cleft. This penetration develops a reaction of the foreign body and results in the formation of cyst and sinus followed by secondary reactions and abscesses <sup>2</sup>.

A pilonidal abscess is determined to be the most common complication related to pilonidal disease <sup>3</sup>, <sup>4</sup>. Pilonidal abscesses may result in large tissue damage and sepsis unless treated. PNS, related to abscess exacerbations, may spread to the anal canal or perianal region <sup>5</sup>, <sup>6</sup>.

Pilonidal sinus is diagnosed by the penetration of hair follicles into one or more sinus walls. This condition attacks younger persons more frequently and

chronically develops with acute and subacute cases of infection <sup>8</sup>. It is frequently observed in the midline of the sacrococcygeal region <sup>8</sup>. This condition limits the lifestyles of the patients and leads to loss of productive capacity <sup>9</sup>. The method of treatment of this surgical condition is controversial still. Currently, there are some surgical techniques for the management of pilonidal sinus abscess <sup>7</sup>.

Different methods of treatments have been proposed such as simple incision and drainage, excision and primary closure, marsupialization, lying open <sup>10</sup> or rhomboid excision and Limberg flap <sup>11</sup>, <sup>12</sup>.

Incision and simple drainage are considered to be the conventional treatment of a pilonidal abscess. These methods can prevent large tissue damage and relieve the pain. But, between 16% and 92.5% of the patients develop PNS after simple drainage. Surgical treatment is required in this situation <sup>13</sup>.

The risk factors for postoperative

complications and recurrence of this condition are male gender, obesity, smoking, family tendency, poor body hygiene, sinus size, and surgical procedures [14](#), [15](#).

The ideal method for treating pilonidal disease must be simple, develop minimal pain, and have a high chance for cure and least recurrence rate. In addition, the technique should avoid hospital admission, insert minimal inconvenience, and require the least amount of time off work for the patient [1](#), [16](#). In this regard, we applied two therapeutic approaches on patients with PNS abscess and compared the outcomes of interest at the first, third, and sixth months of the surgery.

## **Patients and Methods**

### **Patients**

Patients who were diagnosed with PNS abscess and admitted for the treatment between January 2019 and November 2020 were included in this study. This research has been done in east emergency hospital in Erbil city. The patients were assigned either to the excision or drainage of an abscess in a

non-random technique according to the on call general surgeons methods of operation. A total of 97 patients with PNS abscess operated on, 78 of them met the eligibility criteria were undergone excision (n=48) and drainage of abscess (n=30). The patients were followed up for the outcomes of the interest, including infection, pain, discharge, and wound size at the first, third, and sixth months of surgery.

The excision and curettage were performed on 48 patients with PNS abscess, and the other group (30 patients) incision and drainage of pus done with daily dressing. The written consent forms were taken from the patients before the surgery.

### **Inclusion and exclusion criteria**

The patients who were diagnosed with a pilonidal sinus abscess and subsequent surgery in adults aged 17 years and older were included in this study. Other inclusion criteria of this study were having a prothrombin time of fewer than 15 seconds, a normal or near-normal partial thromboplastin time, a

platelet count greater than 50,000/ mm<sup>3</sup> to limit the risk of bleeding, and the absence of any infection at the time of surgery. The exclusion criteria were unwilling to give the written consent form, patients with similar conditions of PNS like pilonidal cysts, and patients with diabetes mellitus.

### **Surgical technique**

The surgical techniques were performed under general anesthesia. The area of the operation was shaved and cleaned with povidone-iodine. In this situation, the patient was in a prone position. For the patients who were treated by skin incision and curettage, a skin incision 2-3 cm was conducted in the fluctuating field. The whole cavity was curetted and washed with hydrogen peroxide after evacuating the abscesses. The remaining materials were removed accordingly. The dressing was performed with saline solution twice daily within the first three days and daily thereafter. The patients in the drainage of the abscess group were left open for drainage following being washed with hydrogen peroxide first

and saline thereafter. The simple drainage was applied from a parallel vertical incision of 2 cm in lateral if the abscess was in midline. The simple drainage was applied with a vertical incision directly over the abscess cavity if it was outside of the midline [17](#).

The daily wound dressings were suggested for the first week, followed by three dressing at the second week and two dressing a week thereafter. We advised the patients to follow the hygiene preventive measures. The suggested hygiene measures were taking showers, using a towel to rub away loose hairs. In addition, they were suggested to perform hair depilation to prevent small hairs from making their way into the cavity or overlooked small pits. The patients were followed up for three-period, the first, third, and sixth months.

For excision method the patient is positioned in the prone position and plasters are used to separate the buttocks, allowing a better view of the natal cleft. Shaving of the operative area done. An antiseptic solution is

applied to the skin, which is then covered with a sterile dressing. The orientation of the sinus is determined by probing through the pit(s) of the sinus. Excision of all tracks with diathermy done. The whole cavity was curetted and washed with hydrogen peroxide after excision of PNS abscess tracks. The dressing was performed with saline solution twice daily within the first three days and daily thereafter. The daily wound dressings were suggested for the first week, followed by three dressing at the second week and two dressing a week thereafter. We advised the patients to follow the hygiene preventive measures. The suggested hygiene measures were taking showers, using a towel to rub away loose hairs. In addition, they were suggested to perform hair depilation to prevent small hairs from making their way into the cavity or overlooked small pits. The patients were followed up for three-period, the first, third, and sixth months.

### **Outcomes measurements**

The pain of the patients was documented as a binary outcome in yes

or no. The operative time, postoperative hospital stay in hours(hr.), and back to normal activity in the day were documented in both groups.

### **Statistical analyses**

The general information of the patients was presented in mean (SD) or number (%). The previous PNS operation and comorbid conditions were determined in prevalence rate as number (%). The operative time (Min), postoperative hospital stay (hr.), back to normal activity (day), and pre and post-operative Hemoglobin(Hb) were determined in mean (SD). An independent t-test was performed to examine pre and postoperative characteristics between patients in the drainage and excision groups. Comparisons of infection, pain, and discharge, and incidence rates of wound development between the patients in the drainage and excision groups at the first, third, and sixth month of the follow-up were examined in the Pearson Chi-squared test.

## Results

During this period we received 78 patient that eligible the inclusion criteria their ages were between 17 to 39 years old mean age was 25.44±5.44. BMI mean was 25.37±1.99.

The patients with PNS who were treated by excision were significantly

older compared to those patients who were treated by drainage of abscess; 26.71 vs. 23.40, P=0.008. The patients in both drainages of abscess and excision were similar in BMI, 24.90 vs. 25.67 (P=0.100) and gender (Male: 83.33% vs. 72.92%; P=0.2881). The female/male ratio was 0.3:1.0 (Table 1).

**Table 1: Comparison of general characteristics between patients in the drainage and excision groups**

Characteristics	All patients	Treatment techniques		P-Value (two-sided)
		Drainage of abscess (n=30)	Excision (n=48)	
Age mean (SD)	25.44 (5.44)	23.40 (3.49)	26.71 (6.05)	0.008 <sup>a</sup>
BMI mean (SD)	25.37 (1.99)	24.90 (2.13)	25.67 (1.85)	0.1001 <sup>a</sup>
<b>Previous operation no (%)</b>	<b>PNS</b>			
Yes	21 (26.92)	8 (26.67)	13 (27.08)	0.9678 <sup>b</sup>
No	57 (73.08)	22 (73.33)	35 (72.92)	
<b>Comorbid conditions no (%)</b>				
Yes	0 (0.0)	0 (0.0)	0 (0.0)	Not applicable
No	78 (100)	30 (100)	48 (100)	
<b>Gender</b>				
Male	60 (76.92)	25 (83.33)	35 (72.92)	0.2881
Female	18 (23.08)	5 (16.67)	13 (27.08)	

<sup>a</sup> an independent t-test and <sup>b</sup> Pearson's Chi-squared tests were performed for statistical analyses.

The study showed that the patients who were treated by excision technique had

significantly longer operative time, compared to those patients who were treated by drainage of abscess 9.65 vs. 5.50 min,  $P < 0.0001$ . In addition, they had a longer postoperatively hospitalization time, 4.19 vs. 3.43 hrs,  $P = 0.0002$ , and required longer time to back to normal activity, 4.69 vs. 4.20 days,  $P = 0.0221$ , respectively. However, both patients who were treated by excisions and drainage of abscess had similar pre and postoperatively Hemoglobin (Hb) (Table 2).

**Table 2: Comparisons of pre and postoperative characteristics between patients in the drainage and excision groups**

Characteristics	Treatment techniques Mean (SD)		P-Value (two-sided)
	Drainage of abscess (n=30)	Excision (n=48)	
Operative time (Min)	5.50 (1.07)	9.65 (2.89)	<0.0001
Postoperative hospital stay (hr.)	3.43 (0.57)	4.19 (0.94)	0.0002
Back to normal activity (day)	4.20 (0.66)	4.69 (1.01)	0.0221
Preoperative Hb	13.41 (0.72)	13.23 (1.18)	0.4360
Postoperative Hb	13.41 (0.72)	13.21 (1.19)	0.4158

An independent t-test was performed for statistical analyses.

The study showed that the patients who were treated by excision and those who were treated by drainage of abscess had similar incidence rates of infection, pain at the first, third, and sixth months of follow-up whereas the incidence rate of discharge was significantly different between the two groups at 3<sup>rd</sup> and 6<sup>th</sup> month of follow up. The patients in both study groups had similar postoperative pain, 66.67% vs. 75.00%,  $P = 0.4287$ , whereas the patients who were treated by drainage of abscess significantly developed postoperatively fever, 16.67% vs. 0.00%,  $P = 0.0068$  (Table 3).

**Table 3: Comparisons of infection, pain, and discharge between the patients in the drainage and excision groups at the first, third, and sixth month of the follow-up**

Outcomes	Treatment techniques Mean (SD)		P-Value (two-sided)
	Drainage of abscess (n=30)	Excision (n=48)	
<b>Month 1</b>			
<b>Infection</b>			
Yes	10 (33.33)	10 (20.83)	0.2225 <sup>a</sup>
No	20 (66.67)	38 (79.17)	
<b>Pain</b>			
Yes	10 (33.33)	15 (31.25)	0.8481 <sup>a</sup>
No	20 (66.67)	33 (68.75)	
<b>Discharge</b>			
Yes	10 (33.33)	17 (35.42)	0.8506 <sup>a</sup>
No	20 (66.67)	31 (64.58)	
<hr/>			
<b>Month 3</b>			
<b>Infection</b>			
Yes	0 (0.0)	0 (0.0)	Not applicable
No	30 (100)	48 (100)	
<b>Pain</b>			
Yes	0 (0.0)	0 (0.0)	Not applicable
No	30 (100)	48 (100)	
<b>Discharge</b>			
Yes	2 (6.66)	0 (0.0)	0.0809 <sup>a</sup>
No	28 (93.34)	48 (100)	
<hr/>			
<b>Month 6</b>			
<b>Infection</b>			
Yes	0 (0.0)	0 (0.0)	Not applicable
No	30 (100)	48 (100)	
<b>Pain</b>			
Yes	0 (0.0)	0 (0.0)	Not applicable
No	30 (100)	48 (100)	
<b>Discharge</b>			
Yes	2 (6.66)	0 (0.0)	Not applicable
No	28 (93.34)	48 (100)	

			0.0809
<b>Postoperative pain</b>			0.4287 <sup>a</sup>
Yes	20 (66.67)	36 (75.00)	
No	10 (33.33)	12 (25.00)	
<b>Postoperative fever</b>			0.0068 <sup>b</sup>
Yes	5 (16.67)	0 (0.00)	
No	25 (83.33)	48 (100)	

<sup>a</sup>Pearson Chi-squared and <sup>b</sup>Fishers' exact tests were performed for statistical analyses.

All patients in both excision and drainage of abscess developed wound at the first month. But, the rate of the wound was decreased at the third and sixth months of follow-up. The patients in the excision group significantly developed less prevalence of wound at the third and sixth months at follow-up (Table 4).

**Table 4: Comparisons of incidence rates of wound development between the patients in the drainage and excision groups**

Characteristics	Treatment techniques				P-Value (two-sided)
	Drainage of abscess (n=30)		Excision (n=48)		
Wound size No (%)	No developed wound	Developed wound	No developed wound	Developed wound	
Wound size (month 1)	0 (0.0)	30 (100)	0 (0.0)	48 (100)	NA
Wound size (month 3)	0 (0.0)	30 (100)	8 (16.66)	40 (83.33)	0.018
Wound size (month 6)	0 (0.0)	30 (100)	45 (93.75)	3 (6.25)	<0.0001

Pearson Chi-squared test was performed for statistical analyses.

**Discussion**

PNS is most commonly observed in young and adult people affects life quality of the patients that they suffer

from pain, discharge and abscess formation, in this study the mean age was 25.44 and mostly affects male. The female to male ratio was 1:3 as

compared to other literatures which shows 1:4. <sup>19</sup>

The patients with PNS who were treated by excision were significantly older compared to those patients who were treated by drainage of abscess; 26.71years vs. 23.40years,  $P=0.008$  this was incidental. The patients in both drainage of abscess and excision were similar in BMI, 24.90 vs. 25.67,  $P=0.1001$ . BMI of all patients; 25.44 was within normal body weight compared to other literatures as shows to be slightly higher in PNS patient group, compared to non-affected participants but the difference was not significant.<sup>8</sup>

The study showed that the patients who were treated by excision technique had significantly longer operative time, compared to those patients who were treated by drainage of abscess 9.65 vs. 5.50 min,  $P<0.0001$  as in the excision method all pilonidal tracks are excised while in drainage this is not required. In addition, they had a longer postoperatively hospitalization time, 4.19 vs. 3.43 hrs,  $P=0.0002$ , and

required longer time to back to normal activity, 4.69 vs. 4.20 days,  $P=0.0221$ , respectively. The ideal procedure should also be uncomplicated, necessitate a brief hospital stay, and allow for a quick return to normal daily activities.<sup>19</sup>

The study showed that the patients who were treated by excision and those who were treated by drainage of abscess had similar incidence rates of infection, pain at the first, third, and sixth months of follow-up whereas the incidence rate of discharge was significantly different between the two groups at 3rd and 6th month of follow up. The patients in both study groups had similar postoperative pain, 66.67% vs. 75.00%,  $P=0.4287$ , whereas, the patients who were treated by drainage of abscess significantly developed postoperatively fever, 16.67% vs. 0.00%,  $P=0.0068$ .

All patients in both excision and drainage of abscess developed wound at the first month. But, the rate of the wound was decreased at the third and sixth months of follow-up. The patients in the excision group significantly

developed less prevalence of wound at the third and sixth months at follow-up. According to some authors, the incision and drainage approach is a successful procedure. However, this procedure would only treat the acute infection, necessitating a reoperation for long-term treatment.<sup>20</sup> Excision of the midline tracts, followed by an open wound, results in an extended healing time. The midline wound is minimized and healing is shortened as a result of the tracts being unroofed. In the presence of a concurrent abscess, this method is beneficial. Recurrence rate was 6.25% which is reported by other literature.<sup>16</sup>

This study shows that complete excision of pilonidal abscess is most effective method than incision and drainage for minimizing of recurrence.<sup>18</sup>

### Conclusions

The study showed that outcome of total excision of pilonidal sinus abscess is significantly better than incision and drainage.

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