

## Original Research Article

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# Evaluation treatment modalities of the pilonidal disease

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## ABSTRACT

**Background:** The pilonidal disease is a minor surgical pathology that has distressful complications. Many original and newer treatment modalities have been used in its management (including excisional and conservative surgical approaches). However, there is non-consensus on any one of them and the main reason is the significant recurrence rate. The objective of the study was to evaluate the excisional surgical modalities and conservative surgical approach in management the pilonidal disease.

**Methods:** A prospective study enrolled 98 patients (80 males vs. 18 females) with chronic sacrococcygeal pilonidal disease. The ages range is 15-42 years. Group IA were treated by simple excision with primary closure, group IB by simple excision with Z-plasty and group II by conservative surgical approach. The wound complications (wound disruption and infection), length of hospital stays, recurrence rate, patients' satisfaction, and the cosmetic appearance were recorded.

**Results:** The excision and Z-plasty has the least recurrence rate, wound complications rate and average time off work days. The simple excision with primary closure has the highest patient's cosmetic satisfaction. Conservative surgical approach has the worst results (recurrence rate 75%, wound infection rate 65%, 21 days average time off work and two days average length of hospital stay)..

**Conclusions:** The Z-plasty is superior to other methods (has the least recurrence rate). The conservative treatment has non-encouraging results, we recommend it for patients unwilling excisional surgery.

**Keywords:** Pilonidal, Conservative, Closure, Z plastic

## INTRODUCTION

Pilonidal disease (cyst, infection) consists of a hair-containing sinus or abscess, occurring most commonly at the natal cleft (over the sacrococcygeal region).<sup>1</sup> Other common sites for its occurrence are umbilicus, axilla and interdigital web spaces.<sup>2,3</sup> Hodges, in 1880, was the father of term pilonidal sinus (PNS) (in Latin: *pilus*=hair; *nidus*=nest).<sup>4</sup> The prevalence of the pilonidal disease is variable, it is highest in Caucasians and less among Africans and Asians.<sup>2,5</sup> Generally, it is about 26 cases per 100,000 persons.<sup>6</sup> It is more common in men than women (3-4:1). They are typically occurring in young adults,

particularly hirsute men.<sup>7</sup> Nowadays, it is nearly agreed that PNS is an acquired condition and not congenital pathology (after a long debate about its origin).<sup>8</sup> The pathogenesis of PNS is that when some of the body fallen hairs accumulated in natal cleft then slowly the hairs penetrate the skin through dilated hair follicles, that is thought to occur particularly in late adolescence. The friction of the natal cleft facilitates the hairs penetration. These loose hairs cause a foreign body reaction that leads to sinus formation and midline pits. These hairs may then become infected and present acutely as an abscess in the sacrococcygeal region. Once an acute episode has resolved, recurrence is common.<sup>1</sup> Therefore, pilonidal

disease describes a spectrum of clinical presentations, ranging from asymptomatic hair-containing cysts and sinuses to large symptomatic abscesses (commonly at the sacrococcygeal region) that have some tendency to recur.<sup>9</sup> Pilonidal sinus is considered an occupational disease (common in Jeep driver's soldiers, that is why it is also called Jeep bottom disease, and in hairdressers). Like the aetiology, there is also controversy about the best treatment modality for pilonidal sinus. Part of the controversy in the treatment, is about surgical excision or conservative surgical approaches. Moreover, there is no consensus about the best surgical technique (simple excision and primary closure or simple excision and open wound policy). New surgical operations and techniques have been introduced like Bascom operation and Karydakis flap operations that reported lesser recurrence compared to older methods in which recurrence rate may reach 25%.<sup>10</sup> In this study, we tried to evaluate the role of conservative surgical approach in PNS and an assessment to some excisional surgical modalities that are used in the treatment of PNS, to help in selection the best modality.

## METHODS

A prospective study that was conducted in Al-Sader Teaching Hospital in Misan province, Iraq for a period of three years from April 2015 to April 2018. A total of 98 patients (80 males vs. 18 females) with chronic intergluteal pilonidal sinus disease were enrolled, their ages range is 15-42 years and median age=30.73 years. We advised all the enrolled patients toward excisional surgical treatment in management their PNS (according to our policy).

A total of 78 patients (62 males vs. 16 females) had accepted the surgical treatment (and we refer to them in this study as Group I), while 20 of our patients (18 males vs. 2 females) had refused the excisional surgery and they asked an alternative treatment and we offered the conservative modality for them (Group II).

38/78 patients (28 males vs. 10 females) in (Group I) were treated by simple excision and primary closure (Group IA) and the remaining 40/78 (34 males vs. 6 females) patients were treated by simple excision and Z-plasty (Group IB). All patient in (Group I) had received perioperative prophylactic antibiotics.

Regarding Group II, the patients were treated conservatively under local anesthesia by removal of intrasinus hairs with a shaving of intergluteal hairs, curetting the granulation tissue from the tract of the sinus, injection of 1 ml of phenol, with antibiotics coverage.

All of the patients were managed by author surgeon (after taking informed consents) and they were followed up at the outpatient clinic or by telephone call, for about two years to exclude the recurrence.

## Exclusion criteria

The patients with PNS at sites other than intergluteal region and the acute cases of PNS (abscesses) that were required just surgical drainage.

The wound complications (wound disruption and infection), length of hospital stays, recurrence rate and the patients' satisfaction with cosmetic appearance were recorded. The analysis of data was carried out using the available Statistical packages for social science, version 20.0 (SPSS-20.0). Data were presented in form of tables of numbers and percentage. Chi-square test ( $\chi^2$ -test) was used for testing the significance of association between variable under study. Statistical significance was considered whenever the p value was  $\leq 0.05$ .

## RESULTS

The distribution of the patients according to age and sex are presented in (Table 1) which reveals that the majority of the patients are of young age group as more than 75% are between 26-35 years. Also, in (Table 1) PNS about four times more common in males than females.

**Table 1: Demographic distribution of the patients.**

Age group (years)	Males		Females	
	No.	$\geq\%$	No.	$\geq\%$
<b>15-20</b>	3	3.06	1	1.02
<b>21-25</b>	8	8.16	3	3.06
<b>26-30</b>	34	34.69	6	6.12
<b>31-35</b>	28	28.57	7	7.14
<b>36-40</b>	8	8.16	1	1.02
<b>41-45</b>	1	1.02	0	0
<b>Total</b>	<b>80</b>	<b>81.63</b>	<b>18</b>	<b>18.36</b>

Regarding the 38 patients in (Group IA) who were treated surgically by simple excision and primary wound closure, 26 patients had good wound healing and uneventful early postoperative period (during the 30 days postoperatively). 12 out of 38 patients (10 males and 2 females) had early wound complications in form of infection and disruption (Table 2) and all of them were treated by opening the closed infected wound with the usual wound care and allowed for healing by secondary intention.

38 patients out the 40 patients in (Group IB) who were treated surgically by simple excision and Z-Plasty technique their wounds healed in the usual expected time and only two patient had wound infection in the early postoperative period (Table 2).

The 20 patients in (Group II) who were treated conservatively, 7 patients had complete healing of their PNS and the remaining 13 patients (12 males vs. 1 female) failed to respond and their PNS had continued discharging (Table 2).

**Table 2: The recorded complications with the methods of treatment.**

The treatment modality	Sex	Wound complication				Recurrence			
		-Ve		+Ve		-Ve		+Ve	
		No.	≥%	No.	≥%	No.	≥%	No.	≥%
Group IA (excision and primary closure)	M=28	18	47.4	10	26.3	24	63.2	4	10.5
	F=10	8	21	2	5.3	9	23.7	1	2.6
<b>Total</b>		<b>38</b>	<b>26</b>	<b>68.4</b>		<b>33</b>	<b>86.8</b>	<b>5</b>	<b>13.2</b>
Group IB (excision and Z-plasty)	M=34	33	82.5	1	2.5	34	85	0	0
	F=6	5	12.5	1	2.5	6	15	0	0
<b>Total</b>		<b>40</b>	<b>38</b>	<b>95</b>		<b>40</b>	<b>100</b>	<b>0</b>	<b>0</b>
Group II (conservative treatment)	M=18	6	30	12	60	4	20	14	70
	F=2	1	5	1	5	1	5	1	5
<b>Total</b>		<b>20</b>	<b>7</b>	<b>35</b>		<b>5</b>	<b>25</b>	<b>15</b>	<b>75</b>

**Table 3: Comparison results of different treatment modalities.**

The treatment modality	Sex	The patient's satisfaction			Average of LOS (days)	Average time off work (days)
		Dissatisfied	Acceptable	Satisfied		
Group IA	M	4	2	22	3	17
	F	1	2	7		
Group IB	M	2	20	12	2	12
	F	4	2	0		
Group II	M	15	3	0	2	21
	F	1	0	1		
<b>Total</b>		<b>27</b>	<b>29</b>	<b>42</b>		

The study showed that the simple excision and primary wound closure gave the best patient satisfaction and the excision and Z-plasty has the least hospital stays and average time off work days (Table 3).

## DISCUSSION

Among so many controversial issues in surgery; the pilonidal disease is still one of the lengthy controversial surgical pathology since its first description by Herbert Mayo in 1833 (described a hair-containing sinus).<sup>11</sup>

Nowadays, it is generally accepted the acquired theory of the origin and pathogenesis of PNS but, still there is continuing debate about the best treatment modality. The main reasons behind the non-consensus about the optimal treatment are the significant recurrence rate and wound complications that occur with different treatment modalities. There are several relevant studies that had reported 7-42% recurrence rates.<sup>12,13</sup> In one of the studies, they found that 2288/4670 of army recruits had a recurrence after surgical treatment of PND by the old original operative methods.<sup>14</sup> It has been stated that the best treatment modality for PND should encompass the following: should be simple, should not need a prolonged hospital stay, should have a low recurrence rate, should be associated with minimal pain and wound care, and decrease patients' time off work.<sup>15</sup> None of the existing surgical options can meet all of these criteria.<sup>16</sup>

The original surgical methods include either excision with primary closure method or excision and open wound method. Newer surgical operations have been developed, that base on the more understanding and dealing with the pathogenesis of PND, which resulted in lower complications rates. Karydakis, in an article about his new invented surgical method in treatment of PND, described the factors that play major role in the pathogenesis of PND, which includes the invader loose hair, some force which causes hair insertion; and the vulnerability of the skin to the insertion of hair at the depth of the natal cleft.<sup>14</sup> Therefore, with respect to that, the newer surgical methods adopt midline off surgical wound (for excision of sinus) and more flattening of natal cleft. Of these promising newer methods are the Bascom cleft lift procedure, Karydakis operation and different surgical plastic flap techniques that showed lower morbidity and recurrence rates.<sup>14,17-22</sup> One of the original treatment of PND is the conservative surgical method that was used by many surgeons in earlier times after description of PND and has continued to a lesser extent till now. Shute FC. et al mentioned in his article about PND in 1943 different physical and chemical methods that had been described and used by many authors in conservative treatment.<sup>23</sup> Among these, by injection one of the chemical compounds like HgCl, silver nitrate, fuming nitric acid, Carony's solution or the use of roentgenotherapy. Nowadays, phenol is the main chemical substance that is used in the conservative treatment of PND. Phenol injection inside the pilonidal

sinus causes sclerosis and gradual closure of the pilonidal sinus.<sup>24</sup> Its use was first reported in 1964 by Maurice and Greenwood, they reported 19% recurrence rate.<sup>25</sup>

In our study, the results of conservative treatment were not encouraging as the recurrence rate was too high compared to excisional surgical modalities (75% vs. 13.2% group IA and 0% group IIB). Also, the recurrence rate after conservative treatment was too high in comparison with other relevant studies that used it 19%, 26.5% and 40.5%.<sup>26-28</sup> Furthermore, it has the highest patients' dissatisfaction (16 out of 20 patients) and longest average off work time in comparison with other modalities of treatment (21 days, 17-day group IA, 12-day group IIB).

Regarding the surgical modalities in present study, the group IB (surgical excision and Z-plasty) showed the best results in terms of lower recurrence rate (0% vs. 13.2% in group IA), lower wound infection rate (5% vs. 31.6% in group IA) which were statistically significant in comparison with other methods ( $p<0.05$ ). Furthermore, the IB group has the least average off work time (12 day vs. 17 day in group IA). The excision with primary closure (group IA) has the highest patients' satisfaction in comparison with other methods (76.3% vs. 28.5% in group IB and 5% in group II).

In our study, the wound infection rate after the primary closure techniques is 31.6% which is higher than that reported by other relevant studies, 5.8%, 13.3% and 17.2%.<sup>16,29,30</sup> whereas flap repair, in our study, reported lower wound infection rate (5%) which is comparable to other studies 4.5% and 5%.<sup>16,31</sup> Our study revealed no recurrence after flap technique (0%) and similar encouraging results reported by other studies 0%, 1.6 and 1.7.<sup>32-34</sup>

The group IB (surgical excision and Z-plasty) is superior to other used methods in term of average off work time and length of hospital stays (LOS), which is in concordance with results of relevant studies that used flap technique (Table 4).

**Table 4: Comparison results of the current study with others.**

The study	Average off work time (days)	Average LOS (days)
Current	12	2
Fazelli <sup>35</sup>	11.9	2.86
Testini <sup>36</sup>	10.4	0.46

Many studies are favoring the Z-flap technique in the treatment of pilonidal disease and considering it as the best therapeutic surgical option with low recurrence rate.<sup>34,35,37,38</sup> Others, recommended it for recurrence with strong discomfort or frequent recurrences or problematic cases.<sup>19,39</sup> According to the results in the present study, we strongly recommend the use of Z- plasty as treatment

of choice for pilonidal sinus (especially for recurrent cases).

## CONCLUSION

The study confirms the superiority of the flap technique with Z- plasty in comparison with PNS excision and primary closure in term of lower recurrence rate, wound infection rate, time off work and the average time of hospitalization. Also the study disfavour the use of conservative treatment as a first-line option and I recommend its use for patients unwilling more extensive excisional surgery.

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