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## A comparative study of wide excision and Z-plasty in the management of pilonidal sinus at tertiary care hospital

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### Abstract

**Background:** Treatment of pilonidal disease is challenging to surgeon. Post-operative course is lengthy, painful and patients are often unsatisfied. Several treatment modalities have been tried for pilonidal disease including incision & drainage of abscess, excision with primary closure, excision with open packing, excision with marsupialization and recently flap surgery. The aim of present study was to compare the results of wide excision and Z-plasty technique in management of pilonidal sinus.

**Materials and Methods:** The present study was conducted on 50 cases diagnosed as a case of pilonidal sinus and admitted in department of surgery of Dr. S. N. Medical College Jodhpur. Patients were randomly divided into two groups. In Group A, wide excision was done and Group B wide excision was followed by Z-plasty.

**Results:** Wound infection was present in 32% of Group A and 16% of Group B patients as postoperative early complication. Localized loss of sensation observed in 16% of Group A and 24% of Group B patients. Postoperative pain was present for  $36.6 \pm 1.22$  days in Group A and  $14.32 \pm 1.83$  days in Group B. Total healing of wound was reported in  $42.2 \pm 2.62$  days in Group A and  $16.6 \pm 1.99$  days in Group B. Mean days for return to work was  $34.64 \pm 2.66$  days in Group A and  $15.44 \pm 1.80$  days in Group B.

**Conclusion:** Excision with Z-plasty was better technique in terms of less post-operative complications, less time in healing of wound, and early days for return to work.

**Keywords:** Pilonidal sinus, wide excision, Z-plasty

### Introduction

Pilonidal sinus is a common painful condition. The condition was first described by Mayo in 1883<sup>[1]</sup> and Hodges in 1880 used the term 'Pilonidal', originating from latin word pilus, which means hair and nidus, means nest<sup>[2]</sup>. It is characterized by the single or multiple opening in the midline.

The peak incidence of disease is in between 15-24 years of age and it decreases after the 25 years. It is rare after the age of 45 years<sup>[3]</sup>.

A pilonidal sinus may be asymptomatic for some time prior to presentation. Symptomatic disease presents as an acute pilonidal abscess, a chronic pilonidal abscess or complex/recurrent pilonidal sinuses. Commonly, patient presents with chronic draining pilonidal sinus tracts and on examination, an opening is usually seen in the midline of natal cleft but occasionally there can be multiple sinus tracts with lateral opening also. There can be cycle of an acute infection, abscess formation, spontaneous drainage and closure of opening. Loose hairs may be seen projecting from orifice or are lying in abscess cavity of sinus tract. The tracts beneath the skin surface may be extensive and lined with granulation tissue. With pressure on the tracts, seropurulent fluid may be discharged. If left untreated either the tracts may become lined with squamous epithelium or they might extend into lateral subcutaneous tissue.

Treatment of pilonidal disease is challenging to surgeon. Postoperative course is lengthy, painful and patients are often unsatisfied. Several treatment modalities have been tried for pilonidal disease including incision & drainage of abscess, excision with primary closure, excision with open packing, excision with marsupialization and recently flap surgery<sup>[4, 5]</sup>. The optimal treatment of pilonidal disease should result early recovery, minimal post-operative pain and recurrence rate.

The aim of present study was to compare the results of wide excision and Z-plasty technique in management of pilonidal sinus with special reference of hospital stay, complications, wound healing time and recurrence.

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### Material and methods

This prospective study was conducted on 50 cases of pilonidal sinuses admitted to surgical wards of MDM Hospital & M.G. Hospital attached to Dr. S.N. Medical College, Jodhpur (Rajasthan).

Patients were divided into two groups:-

Group A (25 patients) – Wide Excision

Group B (25 patients) – Wide excision followed by Z-plasty

Clinical history, examination and appropriate investigation were done.

After complete investigations including hemogram, blood urea, blood sugar, serum creatinine, HbsAg, HIV, X-ray chest and ECG, pre-anesthetic evaluation was done & patients were posted for elective surgery. Spinal anesthesia was given to all patients. The patients were put in prone jackknife position with the pillow under the belly to raise the hips. The buttocks were separated with adhesive plaster to keep natal cleft open for adequate exposure of the operative area. After painting and draping, methylene blue was injected in the tract to stain the tracts for complete excision of the tract.

First group (A) underwent wide excision of the sinus and wound

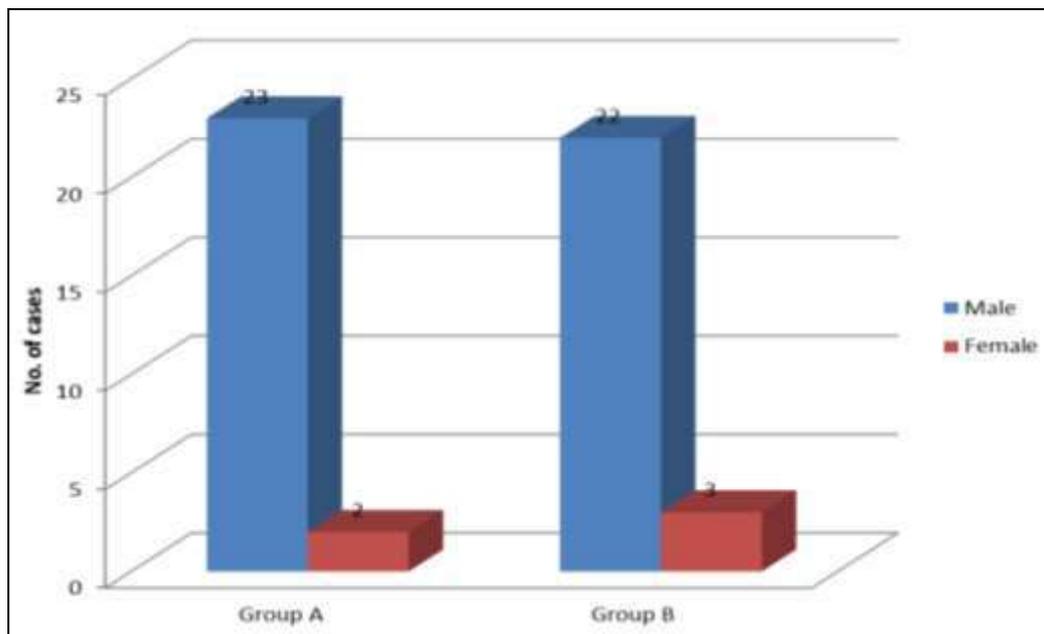
was dressed in postoperative period for secondary healing. Group (B) was subjected to wide excision of sinus tract with closure of wound by Z-plasty and vacuum suction drain in wound postoperatively.

The patients were put on liquid diet and parenteral antibiotics for initial 3 days. Semisolid diet started on 2<sup>nd</sup> postoperative days, oral antibiotics on 4<sup>th</sup> postoperative day. After 48 hours dressing was changed to assess the wound and thereafter on 5<sup>th</sup> day for removal of drain. After discharge of patients follow-up was done twice a monthly for two months. Then every three months for one year. Patients were asked to report if there is any symptoms or complications to the unit residents/consultants.

### Observations and results

**Table 1:** Sex incidence in pilonidal disease

Sex	Number of cases				Grand Total
	Group A	(%)	Group B	(%)	
Male	23	92	22	88	45
Female	2	8	3	12	5
<b>Total</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>50</b>

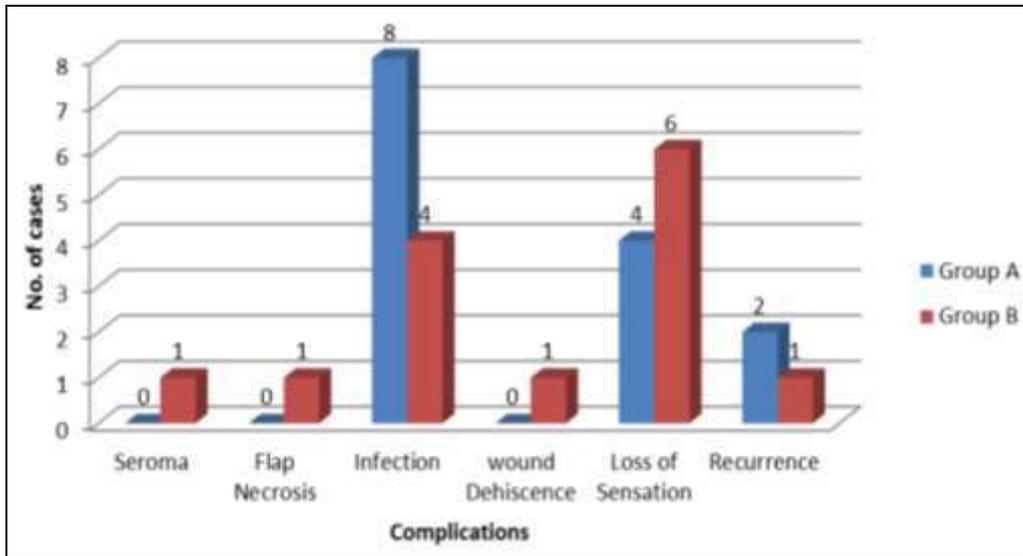


**Graph 1:** Sex distribution in pilonidal disease

There was male to female ratio of 11.5:1 in Group A and 7.33:1 in Group B. Incidence of disease in females was very low (10%).

**Table 2:** Complications in patients with pilonidal disease operated by different methods

Complications	Number of cases			
	Group A	Percentage	Group B	Percentage
Seroma	0	0	1	4
Flap Necrosis	0	0	1	4
Infection	8	32	4	16
Wound Dehiscence	0	0	1	4
Loss of Sensation	4	16	6	24
Recurrence	2	8	1	4



**Graph 2:** Complication in patients with pilonidal diseases operated by different methods

The most common complication in wide excision was infection in 32% cases followed by loss of sensation in 16% cases. The most common complication in wide excision with z-plasty was

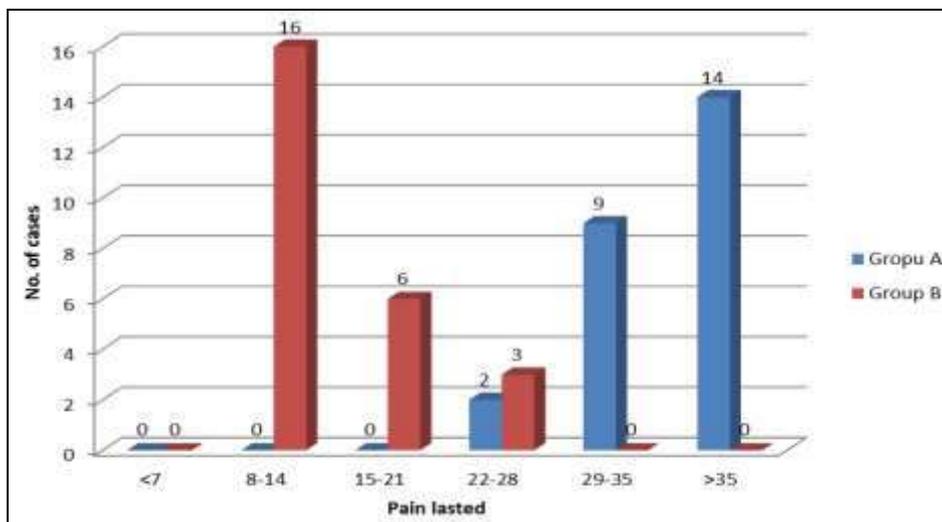
loss of sensation in 24% cases followed by infection in 16% cases.

**Table 3:** Post operative persistent pain in patients with pilonidal disease

Pain lasted (days)	Number of cases			
	Group A	(%)	Group B	(%)
<7	0	0	0	0
8-14	0	0	16	64
15-21	0	0	6	24
22-28	2	8	3	12
29-35	9	36	0	0
>35	14	56	0	0
<b>Total</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100</b>

Surgical Procedure	N	Mean (days)	Std. (days)	95% confidence interval for mean		Test of significance	
				Lower limit	Upper limit	P-Value	Significance
Wide excision	25	36.6	5.385	34.377	38.823	0.0001	Extremely Significant
Wide Excision with Z-Plasty	25	14.32	4.432	12.490	16.150		
Total	50	-	-	-	-	-	-

The mean number of day pain lasted in wide excision is 36.6 days and for wide excision with z-plasty is 14.32days. P-Value 0.0001 Extremely significant



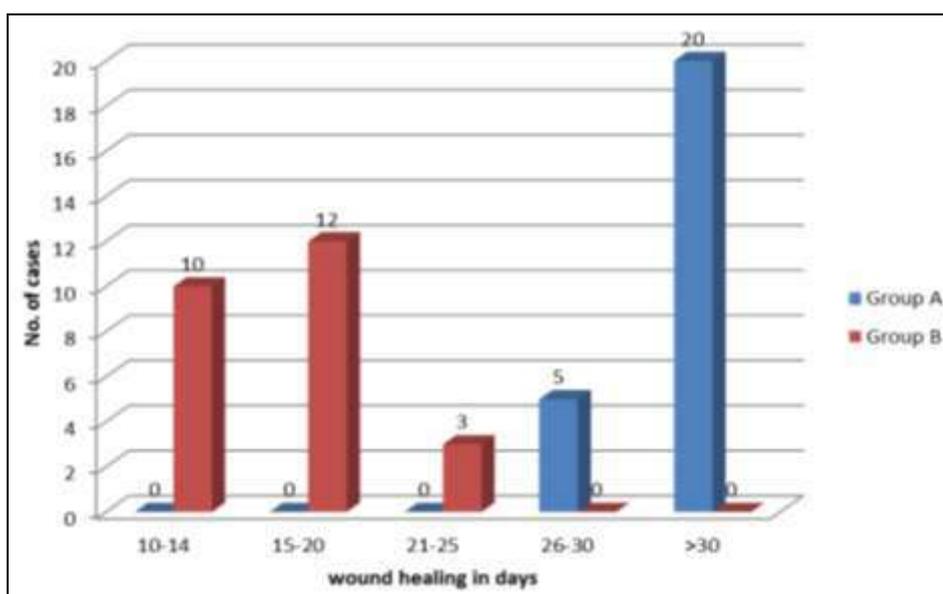
**Graph 3:** Post-operative persistent pain in patients with pilonidal disease

**Table 4:** Total wound healing in days in patients with pilonidal disease operated by different methods

Wound Healing (days)	Number of cases			
	Group A	(%)	Group B	(%)
10-14	0	0	10	40
15-20	0	0	12	48
21-25	0	0	3	12
26-30	5	20	0	0
>30	20	80	0	0
<b>Total</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100</b>

Surgical Procedure	N	Mean (days)	Std. (days)	95% confidence interval for mean		Test of significance	
				Lower limit	Upper limit	P-Value	Significance
Wide excision	25	42.2	6.364	39.573	44.827	0.0001	Extremely significant
Wide Excision with Z-Plasty	25	16.64	4.821	14.650	18.630		
Total	50	-	-	-	-	-	-

The mean days of wound healing in wide excision are 42.2 days and for wide excision with z-plasty are 16.64 days. P-Value 0.0001 Extremely significant



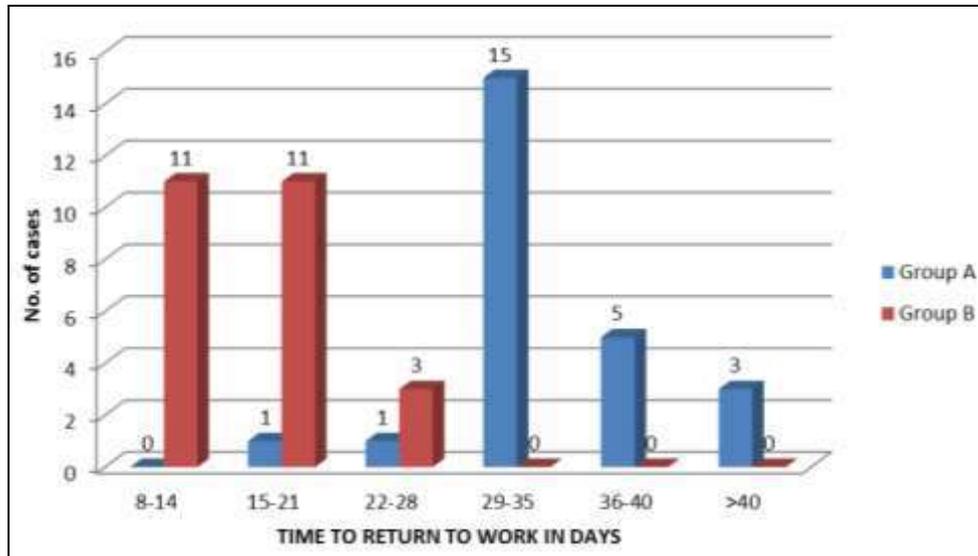
**Graph 4:** Total wound healing in days in patients with pilonidal disease operated by different methods

**Table 5:** Time to return to work in patients with pilonidal disease

Time to return to work (days)	Number of cases				
	Group A	(%)	Group B	(%)	Grand Total
8-14	0	0	11	44	11
15-21	1	4	11	44	12
22-28	1	4	3	12	4
29-35	15	60	0	0	15
36-40	5	20	0	0	5
>40	3	12	0	0	3
<b>Total</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>50</b>

Surgical Procedure	N	Mean (days)	Std. (days)	95% confidence interval for mean		Test of significance	
				Lower limit	Upper limit	P-Value	Significance
Wide excision	25	34.64	6.402	31.997	37.283	0.0001	Extremely Significant
Wide Excision with Z-Plasty	25	15.44	4.379	13.632	17.248		
Total	50	-	-	-	-	-	-

The mean time to return work in Group A was 34.64 days and for Group A 15.44 days. P-Value 0.0001 Extremely Significant



**Graph 5:** Time to return to work in patients with pilonidal disease



**Fig 1:** Female patient with thin hair having middle single external opening



**Fig 2:** Excision and Z-plasty showing obliteration of natal cleft



**Fig 3:** Patient after removal of stitches on 10<sup>th</sup> POD showing obliteration of cleft after Z-plasty

**Discussion**

Pilonidal sinus is an acquired condition usually seen in young adults and carries high post operative morbidity. The most important factor in causing post-operative discomfort is wound infection and post-operative pain. The recurrence is mainly due to incomplete excision. Although many surgical methods of treatment have been described, but all procedures have their own merits and demerits. Complete excision of the sinus is a most common practice, but controversy on how to manage the wound after excision still remains [6].

The present study was conducted at Dr. S. N. Medical College, Jodhpur on 50 cases in the Department of Surgery. Patients were divided into two groups:-

Group A (25 patients) – Wide Excision

Group B (25 patients) – Wide excision followed by Z-plasty

In our study there was male to female ratio of 11.5:1 in Group A and 7.33:1 in Group B. Incidence of disease in females was very low (10%).

In our study infection of the wound (32%) and impaired sensation after healing (16%) were two complications observed in Group A. In Group B, 16% patients had wound infection of which 3 out of 4 patients had minor superficial infection responding to daily care and antibiotics and only one (4%) patient had deep infection leading to partial wound dehiscence at the tip of Z-plasty. 4% patients had seroma after removal of drain and 4% had superficial epithelial necrosis limited to apex of Z. Impaired sensation was observed in 24% patients after complete healing.

In a short term follow up between 3 months to 1.5 years, 2 (8% patients in Group A and 1 (4% patients in Group B) had recurrence of disease. Both groups were managed conservatively with adequate drainage, irrigation of wound and systemic antibiotics. However, follow up percentage was not as expected and majority could be contacted only through telephone rather than personal visit and physical examination. Even the duration of follow up is short enough to comment on long term recurrences of both the procedures. However, larger series and longer follow up will be able to answer the question of recurrence in two groups and to decide superiority of one procedure over another with reference to recurrence.

Persisting postoperative pain in wound was another parameter observed in both groups in present study. Mean period for which local pain persisted was 36.6±1.22 days in Group A and

14.32±1.83 days in Group B (Table No. 3). In 56% patients pain persisted for more than 35 days in Group A and in 64% patients of Group B pain persisted for only 8 to 14 days.

Mansoori (1982)<sup>7</sup> studied 127 case with Z-plasty and reported loss of sensation after healing in 50% patients, tip necrosis in 30% patients. Mark (1985)<sup>[8]</sup> reported wound infection after wide excision in 34% cases whereas Omer (2007)<sup>[9]</sup> reported wound infection in 16% cases after excision and loss of local sensation in 65% patients, wound infection with dehiscence in 4.5% cases after Z-plasty. Mustafa (2008)<sup>[10]</sup> reported loss of tip due to necrosis in 20% and wound dehiscence in 3.3% cases.

Total time taken by wound to heal by different method had been depicted in Table No. 4. In Group B, 40% patients had complete healing within 10 to 14 days and 48% within 15 to 20 days. Only 12% patients took more than 20 days. Whereas in Group A, 80% patients took more than 30 days for complete healing and in 20% cases wound healed between 26 to 30 days. Mean duration of healing was 16.6±1.99 days in Group B and 42.2±2.62 days in Group A which was statistically significant.

Early wound healing after primary closure is major factor favouring treatment of pilonidal sinus by Z-plasty. Ability of patient to return to work is thus influenced by total time taken for wound healing.

44% patients in Group B could return to work before 14 days and similar percentage of patients joined their work between 15 to 21 days. Only 12% required more than 22 days to return to work. But in Group A 60% patient took more than 28 (29-35) days, 20% between 36 to 40 days for same. 12% patients required even more than 40 days before returning to work. Mean rest period in Group B was 15.44±1.80 days and in Group A it was 34.64±2.66 days. Statistically the difference was extremely significant (P=0.0001).

Taubanakis (1980)<sup>[11]</sup> reported mean healing time less than 14 days after Z-plasty. Omer (2007)<sup>[9]</sup> observed this to be 13.52±1.78 days. Khanzada (2007)<sup>[12]</sup> reported healing duration of 42 to 52 days after wide excision. Bissett (1987)<sup>[13]</sup> mentioned 48 days as average healing time after excision. Fazeli (2006)<sup>[14]</sup> also after studying 216 cases, reported healing time of 41 days after excision and 15.4 days after Z-plasty.

McCallum (2008)<sup>[15]</sup> reported total healing time in Z-plasty as 15.4 days and average period to return to work as 17.8 days.

### Conclusion

Wound infection was present in 32% of Group A and 16% of Group B patients as postoperative early complication. Localized loss of sensation observed in 16% of Group A and 24% of Group B patients. Postoperative pain was present for 36.6±1.22 days in Group A and 14.32±1.83 days in Group B.

Total healing of wound was reported in 42.2±2.62 days in Group A and 16.6±1.99 days in Group B.

Mean days for return to work was 34.64±2.66 days in Group A and 15.44±1.80 days in Group B.

Thus, excision with Z-plasty may be a good alternative technique in terms of less post-operative complications, less time in healing of wound, and early days for return to work.

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