ORIGINAL ARTICLE

To compare the results of primary closure of pilonidal sinus with or without redivac drain

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Abstract

Objective: The objective of this study was to assess the outcomes of primary closure of pilonidal sinus and compare it with and without placement of redivac drain.

Material and Methods: This prospective study by convenient sampling technique was carried out at Abbasi Shaheed Hospital, Karachi, from January 2016 to February 2020, after taking the approval. Patients of any age of either gender with confirmed diagnosis of pilonidal sinus through clinical observation of the symptoms including intermittent pain, swelling and discharge at the natal cleft were included in the study. Patients were divided into two groups i.e. group-I comprised of patients (n=24) who were not treated with redivac drain while group-II included the patients (n=24) who were treated with redivac drain during the surgery. Data was analyzed using (SPSS) version 20.

Results: The mean age of patients of group-I was 30.58±4.53 years where as in group-II, the mean age was found to be 31.25±3.98 years. Healing time was 6.08±3.57 weeks in group-I while it was 3.0±1.76 weeks for group-II (p<0.001). In group-I, 11 (45.8%) patients showed infection and in group-II, less number of patients showed infection 4(16.7%) with significant difference (p=0.029). Satisfactory wound healing in group-I was observed in 14(58.3%) where as in group-II the frequency was higher as 20 (83.3%) patients showed satisfactory wound healing. In group-I only 2(8.3%) patients showed the formation of pus in their wounds while it was absent in patients of group-II (p=0.149).

Conclusion: It was predicted that ideal outcome of primary closure after excision was achieved by using redivac drain and the frequency of complications, pus formation and healing time was reduced in comparison to the patients treated without drain. Furthermore it was revealed that satisfactory wound healing was much higher in patients with drain.

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Introduction:

Pilonidal sinus was first termed by Hodges in 1880 as an acquired condition consisting of a cavity formed due to continuous pressure in the natal cleft.[1] This condition may arise due to inflammation of the skin and subcutaneous tissue and is known to affect men twice as commonly as women.[2,3] Although it is a rare disease, with an incidence rate of 26 out of 100,000 (0.026%) globally, it is still thought to be a very serious condition which immensely affects the productivity of an otherwise healthy individual.[3,4] The seriousness of this condition can be highlighted by the fact that annually the number of people affected by this condition has been increasing worldwide with up to 100/100,000 individuals affected yearly in Germany and even higher rates reported in Turkey.[4] Pilonidal sinus usually manifests after puberty and before the age of 40; therefore it mainly affects the young population of the community.[2]

Over the years, the complete etiology of pilonidal sinus has been under discussion. The most

widely accepted theory for development of pilonidal sinus is the formation of a pit due to continuous pressure in the sacrococcygeal area. This pressure may occur due to pre-existing conditions like obesity, poor hygiene, prolong sitting hours or simply due to excess body hairs in this area.[2,3] The pit eventually gets filled with debris and hairs from the buttock which acts a foreign agent inducing an infection. Overtime, the infection and the friction from the hairs result in formation of a deep inflamed sinus.[2]

The clinical presentation varies subjectively according to the type. An acute type of pilonidal sinus is identified as an abscess under pressure while the chronic form presents as an inflammation with fluid discharge.[5] A patient may present asymptomatically or with tenderness, swelling or discharge from the sacrococcygeal area.[2]

The main stay for diagnosis of pilonidal sinus is clinical. On gross examination, the pilonidal sinus appears as a characteristic midline pit in the natal cleft area.[6] Any other form of imaging or laboratory tests are not required for the condition.

Various Treatment modalities have been recommended for pilonidal sinuses according to the severity of the disease. In an acute asymptomatic patient no treatment is required.[7] Patient is simply advised to maintain good hygiene and remove excess hairs in the area with shaving or permanent removal via laser epilation.[1,8] Once the acute infection becomes symptomatic, it may be initially treated conservatively using antibiotics and pain killers. This acute abscess may require further management through administration of phenol injections[2] or by a simple off midline incision and drainage.[2,6]

The standard definitive treatment for chronic pilonidal sinus is surgical excision.[8] A surgeon may choose wide or limited excision to be healed by secondary intention, excision with marsupialization or a wide excision with primary closure.[1,9] For a recurrent or complicated pilonidal sinus, an off midline surgical flaps is used such as Bascom cleft lift, Karydakis, modified Limberg flap or V-Y-Z plasty.[2,6] In some cases, a fibrin glue along with the flap procedures may also be used for better surgical outcomes.[3]

Despite the various treatment options available, none of these have been universally accepted as the standard approach due to the increased chance of recurrence. Although a wide excision with open wound is known to have the least risk of recurrence, it is still discouraged in most individuals due to prolonged healing time and the need for professional wound management.[7] A primary closure may provide a fast recovery with no restriction of mobility, but has been documented with an increased chance of recurrence.[6] Studies within Pakistan have reported a recurrence rate of 5% in a year post treatment follow-up.[9] Nonetheless, a flap and excision with primary closure are still considered as superior forms of treatment in comparison to other management techniques.[4]

An excision with primary closure involves excision of pits and lateral margin of sinus till the level of presacral fascia followed by closure of wound using sutures.[2] Together with the closure, in some cases a redivac suction drainage may be placed to keep the operated cavity clean by flushing it with an antiseptic solution.[1] Unfortunately, there is a dearth of literature on whether use of drainage has additional benefits post-operatively compared to procedures done without the use of redivac drain.

Pilonidal Sinus diseases possess a significant risk of affecting an individual's quality of life.[10] If left untreated or improperly handled, it may result in serious complications including unhealed wounds, recurrent infections and a possibility of developing squamous cell carcinoma within the sinus tract.[2]

Taking into account that excision with primary closure is still a popular technique for treatment of pilonidal sinus,[11] it is the need of the current times to find the best management possible for this disease in order to decrease the risk of morbidity on the patients affected. Thus, the objective of this study was to assess the outcomes of

primary closure of pilonidal sinus and compare it with and without placement of redivac drain.

Materialand Methods:
This prospective study by using non-probability convenient sampling technique was carried out at Abbasi Shaheed Hospital, Karachi. The study was carried out in 3 years i.e. from January 2016 to December 2019 after taking the approval from the hospital ethical committee and the concerned departments.

The inclusion criteria were based on the patients of any age of either gender with confirmed diagnosis of pilonidal sinus through clinical observation of the symptoms including intermittent pain, swelling and discharge at the base of the spine. However, the patients with acute sinuses or recurrent sinuses or who refused to be a part of this study or lost in follow up or having some other pathology were excluded from the study. Patients were divided into two groups i.e. group-I comprised of patients, (24) who were not treated with redivac drain while Group-II included the patients (24) who were treated with redivac drain in during the surgery. After taking consent from all the patients, the preoperative assessments of all the patients were carried out. For this purpose, spinal anesthesia was given to the patients of both the groups and they were allowed to place in a prone position. By following the aseptic measures, the infected area was firstly treated with pyodine and drapping. Following the surgery, the probe was inserted from the external opening of the sinus in order to examine the extent of sinus. Moreover, elliptical incision was carried out and deepened, upto the sacrococcygeal fascia to ensure that all the area of sinus was excised. However, in case of the presence of any secondary tract, the area was being probed again and followed by complete excision. Then hemostasis was achieved by using artery forceps and diathermy.

Hence following the purpose of the study, the wound of the patients of group-I was closed primarily without the placement of radivac drain, firstly, the deep sutures were inserted with strong prolene at the level of fat near sacrococcygeal fascia which were about 1.5cm from the wound margin and then it was left untied. After that, skin edges were approximated with interrupted mattress sutures along with silk and then, prolene sutures were being tied to obliterate the dead space. Lastly, the dressing was applied. On the other hand, the wound of the patients of group-II was closed by considering the same method except that redivac drain was also placed in the depths of the wound to drain any blood, serous fluid or pus.

However, the post-surgical measures were also fulfilled in both the groups. The patients were discharged after 2-3 days of surgery and then followed in outpatient department for the observation of healing time and mainly to check for wound infection and complications regarding the post-surgery for the period of approximately 11 weeks. Also, they were advised to do selective shaving for three weeks along with the prescription of medicines. If any patient developed wound infection, then daily dressing was advised and if needed few stitches or all stitches were removed according to the condition of wound and daily dressing was advised to allow the wound to heal with secondary intention.

Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 21 (IBM Corporation, Armonk, NY, US) and presented in the table by calculating mean standard mean and deviation for quantitative data and frequency and percentages for qualitative data. Furthermore, the t-test and chi- square test was used to assess the significance and to compare the outcomes of the surgical treatment (with or without redivac drain) in both the groups. P value of <0.05 was taken as significant.

Results:
A total of 48 patients, equally divided into two groups contains 24 patients each who had undergone excision of pilondial sinus with or without redivac drain were selected for the study. In group-I, out of 24, the total number of male patients was 20(83.3%) while that of female patients was 4(16.7%). However, in group-II, out of 24, the total numbers of male pa-

Table 1: *Age and Healing time of the patients of Group I and Group II*

Variable	Group I(without drain)	Hypothyroid	Sig
Age (years)	30.58±4.53	31.25±3.98	0.591
Healing time (weeks)	6.08±3.57	3.0±1.76	<0.001

Table 1: *Age and Healing time of the patients of Group I and Group II*

Variable		Group I n(%) (n=24)	Group II n(%)(n=24)	p-value
Gender	Male	20(83.3%)	22(91.7%)	0.383
	Female	4(16.7%)	2(8.3%)	
Infection	Yes	11(45.8%)	4(16.7%)	0.029
	No	13(54.2%)	20(83.3%)	
Pus formation	Yes	2(8.3%)	0(0.0%)	0.149
	No	22(91.7%)	24(100.0%)	
Satisfactory wound healing	Yes	14(58.3%)	20(83.3%)	<0.001
	No	10(41.7%)	4(16.7%)	
Re-opening of wound	Yes	10(41.6%)	4(16.6%)	<0.001
	No	14(58.3%)	20(83.3%)	

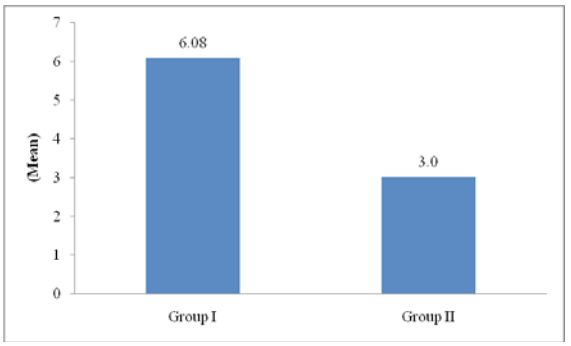

Figure 1: Graph Showing Healing Time of wounds in the patients of group-I and group-II

tients was 22(91.7%) and female patients were 2(8.3%). The mean age of patients of group-I was 30.58±4.53 years where as in group-II, the mean age was found to be 31.25±3.98 years with insignificant difference between the groups (p=0.591). After surgery, the patients of group I took 6.08±3.57 weeks for healing where as in group-II, the patient showed a period of 3.0±1.76 weeks for healing with highly significant difference between the groups (p=<0.001) (table:I).

In group-I, 11(45.8%) patients showed infection. Contrastingly in group-II, less number of patients showed infection i.e. 4(16.7%) with significant difference between the groups (p=0.029). In this way, the satisfactory wound healing in group-1 was observed in 14(58.3%) where as in group-II the frequency was higher as 20 (83.3%) patients showed satisfactory wound healing. Due to infection, very few patients also showed the formation of Pus. Hence, in group-1 only 2(8.3%) patients showed the formation of pus in their wounds while no pus was observed in the patients of group-II (p=0.149). Considering the pus formation and several other variables such as edema and severity in the infection, re-opening of wound was performed in 10(41.6%) patients of group-I. however, in group-II, only 4(16.6%) patients required the re-opening wound (table: 2.0).

Discussion:

The treatment of pilondial sinus is still a debate and thus considered as a controversial matter due to its complexity. Recent study has revealed that pillonidal sinus is an acquired disease.[12] It's important cause include deep natal claft which may cause buttock friction and poor maintenance of personal hygiene which causes the accumulation of debris and hairs in the cleft. To prevent the accumulation of hairs into the natal claft, Karydakis, in his study used an asymmetric excision and primary closure.[13]

The disease can be managed by both surgical and non-surgical methods however surgical approach is more acceptable such as excision and healing by secondary intention, excision with reconstructive procedures, and excision and primary closure.[14] In accordance with the results of our study, group-II (with drain), on comparison with group-I (without drain), showed reduction in healing time (3.0±1.76 weeks) as excision and primary closure have been reported to consume short time for the healing process.[14]

Moreover, on comparison with several others procedures, the primary closure technique is more reliable in providing excellent outcomes such as early wound healing.[15] The perfect and ideal surgery is the one which offers lesser stay or hospitalization, less cost, rapid wound recovery, and higher rate of wound healing. Allan Mersh reviewed in his study about different surgical procedures for pilonidal sinus and

revealed the healing time of 10-15 days in case of excision by primary closure.[16] Another study reported excellent results of using redivac drain for the purpose of excision and primary closure on 31-patients with pilonidal sinus. According to his research, rapid healing is the main focus of primary closure and it can be achieved by prevention of infection and pus formation. Furthermore, in order to prevent these complications, he considered the use of redivac drain of high vaccum.[17] The findings of the above study are consistent with our study in which we observed that, group-II (with drain) showed lesser infection rate and the formation of pus as compared to the patients of group-I (without drain).

After excision, laying the wound open creates different complications and dressings are frequently needed which may cause problems for the patients and also, the wound healing time becomes prolonged. On the other hand, in case of less professional surgery or severe disease factor, wound re-opening is considered as an option thus, this wound breakdown is also considered as a complicated process as re-opening of premature skin edges before a complete wound healing may increase recurrence.[1] Numerous studies have reported post-operative complications such as delayed wound healing, re-opening of wound, and patient discomfort which ranged between 1% to 43% (18-20). However, in our study, the frequency of re-opening of wound in group I and II were 10(41.6%) and 4(16.6%) respectively. The frequency of satisfactory wound healing should be higher in order to prevent post surgical complications which may lead to wound-reopening procedures. After the surgery, the most obnoxious complication arises when midline wound remains unhealed and is commonly seen after wide local excision without primary closure.

There are several other procedures and treatment of the disease with Rhomboid flaps, Z plasty or gluteal-myocutaneous flaps in order to reduce complications such as wound re-opening and to achieve higher wound healing satisfactory ratio. In one of the study conducted by Tekin, about 150(93%) out of total 162-patients reported good and satisfactory wound healing when treated with Limberg flap with only 2% of recurrence and complications.[21] Another study reported least rate of complications in patients of pilonidal sinus undergoin surgery.[22]

One of the study, reported the superiority of excision and primary closure technique over others in terms of satisfactory wound healing, less recurrence and complications rate. In one of the study, Excision and primary closure provided satisfactory results with 95% wound healing ratio.[23] In 2005, another study using excision and primary closure technique reported no major post surgical complications including wound reopening and recurrences up to a maximum follow up of 4-years.[24]

Similarly in 2010, the evidence from a study suggested more rapid healing after primary closure with 0.42% of recurrence and further complications and with approx 99.68% of satisfactory wound healing.[25] In the current study, the group-I (without drain) showed 14(58.3%) of wound healing ratio in the patients whereas the patients of group-II (with drain) reported 20(83.3%) of wound healing which ultimately reveals the significance of using redivac drain for treating pilonidal sinus.

Another study conducted by Tritapepe R, Di Padova C who treated 243 patients by excision and primary closure technique using a suction drain provided similar evidence as that of the our study.[26] The qualitative approach of our study has ascertained that we have assessed the extensive range of patients of pilonidal sinus. However, the study might not be immune from practice and selection bias. Considering the findings of our study and to what extent they will be consistent with the follow up of the patients will be revealing to assess more facts for the appropriate surgical management of pilonidal sinus.

Conclusion:

It was predicted that ideal outcome of primary closure after excision was achieved by using redivac drain and the frequency of complications, pus formation and healing time was reduced

in comparison to the patients treated without drain. Furthermore it was revealed that satisfactory wound healing was much higher in patients with drain.

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Role and contribution of authors:

Dr. Bushra Tasneem, collected the data, references and did the initial writeup

Dr. Aisha Tasneem, helped in collection the data and also helpd in introduction writing

Dr. Aqsa Ismail, collected the references and helped in discussion writing.

Dr. Rahil M. Rehman, critically review the article and made final changes.

Dr. Abdullah Muttaqi, further review the article and did useful changes.

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