Brushing method in the surgical treatment of pilonidal sinus

Kalemoglu M1, Kalemoglu E2

1 Uskudar University, SMYO, Istanbul.
2 Bahcesehir University Faculty of Medicine, Istanbul

Abstract

Background/Aim: The aim of study is to assess to examine postoperative complications and recurrences and to aim to determine the efficacy of Povidone-iodine soap brushing (PISB) on surgical treatment of pilonidal sinus. Although pilonidal sinus seems like a simple lesion, its treatment may be very difficult because of high postoperative complication and recurrence rates.

Material and Methods: Four hundred and fifty patients who were operated for pilonidal sinus between 1997 and 2012 were included in the study. Excision + Povidone-iodine brushing + primary repair in 230 (51%) cases (Brushing group), excision + primary repair in 220 (49%) cases (Surgery group) were applied.

Results: While four recurrences (1.8%) were detected in the polyvidon iodine brushing technique, fifty recurrences (22.7%) were detected in the surgery group (p<0.0001). Postoperative complication rates were also lower in the brushing technique group than the surgery group (p<0.0001).

Conclusion: It is concluded that excision + Povidone-iodine brushing + primary repair in the treatment of pilonidal sinus may be a preferable method because of lower complication and recurrence rates.

Key Words: Pilonidal sinus, surgical treatment, polyviodon-iodine, primary closure

Introduction

Pilonidal disease is a very common disease, especially in young men, and often complicated by infection. It is usually located in the sacrococcygeal area. The term ‘pilonidal’ was first associated with this condition by Hodges in 1880 [1,2]. It comes from the Latin “pilus” meaning ‘hair’ and “nidus” meaning ‘nest’. This term was used to describe the situation of trapped hair in this unusual form of chronic natal cleft skin infection involving skin and subcutaneous tissue [1,3]. Hodges and authors who came after him believed that the disease was congenital in origin and various theories were developed, such as the preen gland theory, the neural canal theory and the sacral skin in-drawn theory [4]. The incidence of pilonidal disease reaches a peak between 16 and 20 years of age and remains high until the age of 25, and then incidence begins to decline rapidly [5].

The pathogenesis of pilonidal disease is postulated to be related to hair invaginating into the skin, and subsequently inciting an inflammatory reaction [6,7].

Several treatment modalities have been used for pilonidal disease, including shaving, incision and drainage, phenol application, cryosurgery, excision with primary closure, excision with open packing, excision with marsupialization (partial closure) and, flap surgery [8–11].

In this study the purpose is to examine postoperative complications and recurrences and to aim to determine the efficacy of PISB on surgical treatment of pilonidal sinus.

Material and Methods

In this study, 450 patients who were operated due to pilonidal sinus at General Surgery Service between 1997 and 2012 were investigated. Between 1997 and 2012, 450 patients were operated by the same senior surgeon who had been trained in the same Surgery Clinic (Haydarpasa Military Teaching Hospital). The patients were operated in Sankamis Military Hospital General Surgery Unit in the period of 1997-2000 and in various private hospitals also military (Haydarpasa Military Teaching Hospital) hospital in Istanbul 2000-2012 period. Before the hospitalization, an informed consent was obtained from all patients for operation and the study.

Patients were divided into two groups namely Brushing Group and Surgery Group. Povidone-iodine Brushing Group patients (230 cases–51%) were operated by the PISB + Excision plus primary closure. Patients of Surgery Group (220 cases–49%) were operated by Excision plus primary closure. PISB method was preferred at active infective sinus pilonidal cases. Active infective flowing sinus ostium was observed on 230 (51.1%) patients out of 450, who PISB method was applied. We used PISB method for mechanical and bacteriological wound cleaning.

The results of 450 well-documented patients who were operated on for pilonidal disease were analyzed. Patients with rather limited disease that was treated by shaving or lay-open technique were excluded, as well as patients with
acute abscesses, endocrine disorders or physical or mental disability.

Surgical Procedures
Hair of the gluteal and sacral regions was shaved a few days before the operations, and rectal cleansing with an enema was performed 4 h preoperatively. Equally premedication was applied on the patients. Patients were operated on under spinal anaesthesia in prone jack-knife position. Appropriate cleansing of the operation site was performed with 10 % Povidone-iodine (PVP-I). 1.5 g of cefuroxim sodium was given intravenously for antibioprophylaxis. Between 0.5 and 1 mL of methylene blue was injected without pressure through the most prominent opening of the pilonidal sinus to help to clarify the margins of the diseased tissue. An elliptical incision was made and deepened down to the post-sacral fascia with blade to incise the diseased area en-block.

Bacteriological Procedures
For this purpose the deepest part of the wound area was reached with a sterile swab and the stick was turned through its own axis in order to touch wound material with sticks surfaces. During the taking of cultural examples any touch from outside of skin was prevented and cared. Examples were put into the Muller Hinton Broth (MHB) and were waited 8 hours long in 37 degree Celsius in the incubator in order to multiply bacteria. Later examples were taken from MHB and put into Agar which has 5% sheep blood and Ethylene Methyl Blue (EMB) Agar and for 24 hours in 37 degree Celsius incubated. Multiplying bacteria were defined according to colony morphology; their painting properties with gram stain catalyze activities, classic biochemical properties. We take wound culture samples from the PISB + Excision plus primary closure surgery group.

Surgery Group
Excision plus primary closure: An elliptic-shaped excision was carried out. Wide excision was followed by the placement of six to eight 1/0 polypropylene deep full-thickness tension sutures including the post-sacral fascia and crossing symmetrically through both sides of the elliptical defect. Besides incision edges were tied not to settle on intergluteal sulcus. A vacuum drain was placed deep in the midline and the skin was closed primarily with 3/0 polypropylene. The skin incision should be kept off the midline as much as possible. Keeping it off the midline avoids fixation of the healing scar to the coccyx.

Figure 1: The skin incision keeps off the midline (a,b,c). Wide excision was followed by the placement of six to eight deep full-thickness tension sutures including the post-sacral fascia and crossing symmetrically through both sides of the elliptical defect. The skin was closed primarily interrupted mattress sutures (d,e). The tension was softly tightened over a gauze roll (f).

Follow Up and Analysis of the Data
The patients were asked oral intake at 6 h postoperative-ly. They were encouraged to walk after 8 h postoperatively, but they were asked to omit full flexion of the sacral region for 2 weeks. Unless infection, significant pain or other complications were noted, the patients were discharge home after the 12th postoperative day following removal of the sutures. Postoperative infection was defined as the development of cellulitis and/or purulent discharge from the wound edges or drain. In order to define the postoperative time off work, the patients were asked when they felt comfortable and convenient to start their daily (professional) activities.

The groups were compared in terms of hospitalization time, postoperative infection, recurrence and time off work. The patients were observed for 12-25 months (mean 14.3). The patients were re-examined at 1 and 2 weeks, 1, 3, and 12 months postoperatively and then on a yearly basis. The patients were asked to shave their hair preoperatively and they continued to do so until their wounds
healed. All patients were compliant to this advice when checked at follow-up.

For statistical analysis, the statistical software package SPSS 11.01 for Windows (SPSS, Chicago, IL, USA) was used. Continuous data were presented in the form of mean ±SD (range) for continuous data parameters and median for non-parametric data parameters. Categorical data were presented in the form of number and percentage.

Analytical statistics of data between group comparisons of continuous data parameters were performed by using the Student’s t test for normally distributed data. Analytical statistics of data between group comparisons of categorical data parameters were performed by using the chi square test or Fisher exact test.

The power of significance (probability) was postulated as p<0.05 for non significant comparisons, p<0.05 for significant comparisons and p<0.001 for the highly significant comparisons.

Results
Four hundred and fifty patients were included in the study. There were 418 (93%) male and 32 (7%) female patients. The mean age was 21.88±3.05 years (range: 16-32 years old). There were no significant differences among the three groups with respect to age, sex distribution or previous medical history.

Escherichia coli was the most common bacterium isolated from the wound culture of PISB + Excision plus primary closure (121/230, (48%)) during the operation. 70 of which were Escherichia coli, 20 of which Proteus were, 19 of which were Beta-Hemolytic Streptococ, 12 of which were Staphylococcus aureus.

The proportions regarding patients’ recurrences and complications are showed on Table 1. While four recurrences were observed in PISB group (1.8%), 50 recurrences (22.7%) in 220 patients who were not in brushing group were observed. This table indicated that the complication ratio on the patients who were applied PISB method group was lower than the surgical group had (p<0.0001).

Table 1: Complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>Brushing n (%)</th>
<th>Surgery n (%)</th>
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</thead>
<tbody>
<tr>
<td>Infection</td>
<td>2 (0.9)</td>
<td>59 (27)</td>
</tr>
<tr>
<td>Recurrence</td>
<td>4 (1.8)</td>
<td>50 (22.7)</td>
</tr>
<tr>
<td>Wound dehiscence</td>
<td>4 (1.8)</td>
<td>18 (8.2)</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Serous leaking</td>
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Two postoperative infections were detected in brushing method group (0.9%). Although these patients underwent drainage and medical treatment, recurrence were seen 12 and 14 month later. The wound infection was seen in 59 cases (27%) of surgery group. Twenty-nine of these patients had stitch abscesses and they were treated by suture removal with antibiotic treatment. The remaining thirty cases were managed with antibiotics. The wound infection rate was higher in surgery group (27%; 59 cases), than the brushing group (0.9% 2 cases), (p<0.0001).

No postoperative bleeding and serous leaking were detected on the patients. Wound dehiscence, at some parts of incision line, was detected in four (1.7%) patients who were applied PISB method. But, 18 (8.2 %) patients in surgery group had wound dehiscence (p<0.0001).

Considering the hospital stay, there was no significant difference between the groups which was 13.73±1.95 days in Brushing group and 13.91±2.05 days in surgery group (Table 2).

Table 2: Hospital stays

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Average Hospital Stay (Days)</th>
<th>Range(Days)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brushing Group</td>
<td>13.73±1.95</td>
<td>10-18</td>
<td>NS</td>
</tr>
<tr>
<td>Surgery Group</td>
<td>13.91±2.05</td>
<td>10-20</td>
<td></td>
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</table>

The average time to work was 2.15±0.05 weeks for brushing group. There was no significant difference between the groups as in surgery group was 2.17±0.12 weeks (Table 3).

Table 3: Return to work

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Average Time of return to work (Weeks)</th>
<th>Range (Weeks)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brushing Group</td>
<td>2.15±0.05</td>
<td>1-4</td>
<td>NS</td>
</tr>
<tr>
<td>Surgery Group</td>
<td>2.17±0.12</td>
<td>1-4</td>
<td></td>
</tr>
</tbody>
</table>

On comparing the perception of pain post-operatively among the studied groups, patients in brushing group showed the lowest visual analogue scale scoring at 4, 10, and 16 hours post-operatively. On the other hand, there were no statistically significant differences between brushing group and surgery group patients at the same time intervals.

Discussion
During the last 25 years many treatments have been advocated for pilonidal sinus but no consensus has emerged. The treatment goal of pilonidal sinus is to provide a high chance of cure with a low recurrence rate, complication rate and time off work for the patient [4,5].

In our study, the postoperative complication and recurrence’s proportions, in Brushing method group, were detected lower than surgery group.

The ideal surgical treatment of pilonidal disease remains unresolved. Complete excision of the pilonidal sinuses and secondary tracts, down to the sacral fascia is essential to minimize recurrences. Some of them have advocated that the resulting deep wide wound be left to granulate, because primary closure may result in excessive skin tension and subsequent dehiscence. Others have suggested alternative techniques such as marsupialization of the wound edges, or the use of extensive flaps to hasten the wound healing process [12].

Morell and et al. [13] made some searches in 1991 and totally they operated 59 patients. Out of those; excision + laying open on 28, marsupialisation on 11 and excision + primer repair on 20 patients were applied. As a conclusion
they reported that the best method regarding wound recovery and recurrence is excision + primer repair. Al-Hassan and et al. [14] compared the primer repair applied after excision and open leaving on 100 patients. They observed the patients for 29 months and examined them regarding wound recovery and recurrence. Finally, they decided that the primer repair is more preferable method. Another study showed that morbidity developed in 24 patients treated by primary excision (infection rate was 10, flap oedema 13, wound dehiscence 5), whereas only 3 patients had these morbidities after Modified Limberg’s flap procedure (infection 2 and flap oedema 1). Eleven patients had recurrence after primary closure and no recurrence for Modified Limberg’s flap [15]. Rossi and et al. [16] applied a set of 106 primer repair method and reported that the average recovery period was 14.6 days. The recurrence was %3.26. In addition, they found out that the hospitalization period was 5.5-23 days when excision + primer repair method was applied at surgical treatment of pilonidal sinus; the complication proportion was %3.6-31.5 and the recurrence proportion was %0.38. Lee, Surrell and Peterson reported that treatment varies greatly and is often less than satisfactory, with the rate of recurrence reported to be as high as 50% [17-19].

Mc Guinness managed the complex pilonidal sinus with excision and vacuum-assisted closure. Regarding this goal, in addition to our precautions, we used sucking drain [20].

There are not many literatures about Povidone-iodine which is used at Sinus pilonidalis. Williams studied 5 years on 31 events and stated that primer repair can be applied successfully if the cases are protected against infection and the irradiation of wound with povidone-iodine. Sepsis and haematoma formation, the causes of wound breakdown after pilonidal sinus excision, have been prevented by preoperative preparation, prophylactic antibiotic administration, wound irradiation with povidone-iodine and simple skin closure over a Redocav suction drain for at least 4 days [21]. These data comply with the data we gained from our study. Also Allan use PVP-I irrigation on operation wounds after the bleeding control and reported that similar results [22]. Literature reports point to high rates of the bacterial colonization in the pilonidal sinus, found in 88.5 % of patients admitted for surgical treatment. Anaerobes predominate in bacteriological tests, both in mixed and pure cultures. The ratio of anaerobes to aerobes is reported to be 5 to 1 [23-25]. Alain reported that excision and simple closure of pilonidal sinus carries the advantages of quick healing and low rate of breakdown and recurrence [22].

In our study, proportions of postoperative complications and recurrence on the cases which were applied primer repair with PISB, the repair method, were detected lower meaningful that the proportions of the cases which were not applied primer repair with PISB.

The hospitalization period is longer than normal. This also arises from our hospital. Young soldier patients usually have long journeys to go to their hometowns after the operation and usually they go to the places where there is a not adequate health service. Thus, the patients are hospi-
talized until the recovery process is completed or possible complication risks are reduced to lowest level. This situation may seem like a paradox. But in fact, it is useful to detect early complications.

Conclusion

As a result, according to the data we gained during our study, we observed that brushing methods are more preferable. The skin incision should be kept off the midline as much as possible for the best result. Brushing methods with Povidone-iodine may help surgical healing without wounds infections by using mechanic and antibacteriologic effects. We concluded that excision + primer repair with PISB is a trustable and successful method on pilonidal cases, viewpoint of lower infections rate, complications, and recurrence rate.

References


Author for correspondence:
Assoc. Prof. Murat KALEMOGLU MD
General Surgeon
Hisar Intercontinental Hospital
34768 Umraniye-Istanbul- TURKEY
Email: muratkalemoglu@yahoo.com
Telephone: +90 5348717722
Fax: +90 2165241300