

COMPARISON OF DIFFERENT SURGICAL OPTIONS IN THE TREATMENT OF PILONIDAL DISEASE: RETROSPECTIVE ANALYSIS OF 175 PATIENTS

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Pilonidal sinus disease is a benign disorder with an unidentified etiology and is observed mainly in young adults. It is an important health problem because it causes work loss. Although various nonsurgical treatment options have been tried up to date, there is a consensus on surgical intervention to treat the disease today. The optimal surgical method should be simple, associated with short hospital stay and low recurrence rates. In this study, patients who have undergone different surgical treatment methods due to pilonidal disease were retrospectively analyzed. The medical records of 175 patients who were operated on between 2002 and 2005 at the General Surgery Departments of Gaziosmanpasa University Medical School and Bartin State Hospital for pilonidal disease were reviewed for treatment option, postoperative complications, hospitalization time, work-off periods, and recurrence rates. The patients consisted of 150 (85.3%) males with a mean age of 26.47 ± 7.78 years. Marsupialization was applied to 82 (46.9%), unroofing to 20 (14.7%), primary closure to 29 (16.6%), and Limberg flap to 44 (25.1%) patients. The longest hospitalization period of 3.61 ± 1.08 days was observed in the Limberg flap group. The longest return to work period (20.12 ± 5.1 days) was observed in the marsupialization group. Both differences were significant. The highest complication rate was observed among the primary closure group (31%) followed by the patients treated by Limberg flap technique (15.8%). In the primary closure group, infection was detected in five (17.2%) and wound dehiscence in four (13.8%) individuals. The highest complication rates (31.03%) and recurrences (13.8%) were observed in the primary closure group. Various operative methods utilized in the treatment of pilonidal disease are associated with a number of advantages and disadvantages. Postoperative complication rates of unroofing and marsupialization are low, but require long wound care. In our study, we did not observe any recurrence among the patients treated by unroofing, but experienced a high recurrence ratio among subjects treated by marsupialization. In addition, there were high complication rates in the primary closure and Limberg flap groups. So, the best option is to explain the advantages and disadvantages of the available surgical methods and respect the patient's decision.

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Pilonidal sinus is a common health problem that usually has an acquired etiology and is mainly encountered in young males. There has been a debate on the appropriate surgical and conservative treatment options. The optimal surgical treatment option should be simple, inexpensive, and associated with low hospitalization periods and recurrence rates. None of the existing surgical options can meet all of these criteria [1–3]. Total excision of the involved sinus tract to the post sacral fascia is the most frequently applied surgical option. But dilemma still exists on the ideal type of reconstruction. The defect formed on the excised area might be primarily closed, partially closed as is the case in marsupialization, left open for secondary healing, or reconstructed by differing flap techniques. Advantages and disadvantages have been reported in the literature previously, but we did not find any study comparing these four techniques.

The aim of this study was to compare these four techniques commonly used in pilonidal disease by retrospectively analyzing the patients treated at the Surgical Departments of Gaziosmanpasa University Faculty of Medicine and Bartın State Hospital for complication rates, hospitalization periods, and recurrence rates.

PATIENTS AND METHODS

Medical reports of 175 patients treated at the Surgical Departments of Gaziosmanpasa University Faculty of Medicine and Bartın State Hospital between 2002 and 2005 were retrospectively analyzed. Postoperative follow-up of all patients were done at the index institutes. The surgical treatment options, complication rates, hospitalization, and work-off periods were analyzed.

Patient protocol

Shaving of the operative field was done on the morning of the operation in each patient. Prophylactic 1 g Cefazolin-Na was administered preoperatively through a peripheral venous line. Most operations were performed under spinal anesthesia with the patient placed in prone position. General or local anesthesia was used for medical indications or owing to patient's choice. Buttocks were retracted using adhesive tape in order to obtain a better visualization of the operative field. After skin preparation, the anus

was excluded from the area with surgical drapes. In cases undergoing unroofing, external opening of the sinus was gently cannulated by a stile. The roof of the sinus tract was excised, leaving the bottom intact, and curettage was applied to the posterior wall of the tract. In the remaining subjects, methylene blue was injected through the external opening of the sinus tract. Thereafter, all tracts were excised by an elliptical incision, with a 1-cm margin to the post sacral fascia. Dissection and hemostasis were achieved by electrocautery. After appropriate hemostasis, the defect was partially closed by suturing the wound edges to the post sacral fascia with 2/0 polypropylene in patients undergoing marsupialization, completely closed with 2/0 polypropylene in primary closure, and left open in secondary healing. In patients undergoing Limberg flap transposition (LFT) the skin was marked with a marker pen and the involved area was excised by a rhomboid excision. To cover the defect, a fasciocutaneous rhomboid Limberg flap was created on the right or left buttock, transposed and sutured with 2/0 polypropylene to the excised area with no tension. The defect at the flap prepared area was primarily closed. A suction drain was placed under the flap and was externated through a separate stab incision. Postoperative analgesia was achieved by oral administration of Naproxen sodium. Daily wound care was performed for each individual.

Statistical analysis

One-way analysis of variance followed by Tukey's HSD test for *post hoc* analyses was performed for numeric variables. Non-numeric variables were compared using the χ^2 test (likelihood ratio). The *p* values below 5% were considered to be significant.

RESULTS

Our patients consisted of 150 (85.7%) males and 25 (14.3%) females, with a mean age of 26.4 ± 7.7 years (range, 16–62 years). Marsupialization was applied to 82 (46.9%), unroofing to 20 (11.4%), primary closure to 29 (16.6%), and Limberg flap to 44 (25.1%) cases. The longest mean hospitalization period (3.61 ± 1.08 days) was observed in patients who underwent LFT. This period was significantly longer than the other treatment options ($p < 0.001$). The longest mean work-off period was found in cases with marsupialization

(20.12±5.1 days). This period was also significantly longer than the others ($p < 0.001$). Hospitalization and work-off periods of our patients are depicted in Table 1. The patients who underwent primary closure and LFT had the highest complication rates (31% and 15.8%, respectively; $p = 0.003$). Postoperative complications in the primary closure group consisted of wound infection in five (17.2%), and wound dehiscence in four (13.8%) cases, whereas those in the LFT group consisted of two wound infections (4.5%), three hematomata (6.8%), and two wound dehiscence (4.5%). Rates of complications are depicted in Table 2. Recurrence rates were the highest among patients who underwent primary closure and marsupialization (13.8% and 8.5%, respectively). The difference was significant ($p = 0.011$).

DISCUSSION

Main factors in the etiopathogenesis of pilonidal disease are the abrasions formed in the intergluteal groove by physical activities such as walking, followed by migration and penetration of hair follicles into the natal cleft. Karydakis attributed this process to hair follicles, factors forcing their migration, and availability of the penetration area [4]. This process is responsible

for the impossibility of spontaneous recovery, and is the mainstay of recurrences. Especially in the early course of the disease, clearance of hair follicles and depilation of the involved area might palliate symptoms related to pilonidal disease, though patients frequently seek surgical intervention. Simple drainage of the acute abscess in pilonidal disease does not provide adequate solution, and in most instances, a definitive surgical intervention is required.

Hospitalization and work-off periods are relative measures of outcome. They are strongly related to personal, sociocultural, socioeconomic levels, type of job, social assurance, and behavioral patterns. Within these aspects, we observed shorter hospitalization periods in patients who underwent primary closure or marsupialization. On the other hand, the longest work-off periods were detected in marsupialized patients. Patients with primary closure had the shortest work-off periods, while they experienced the highest rates of recurrence, which is the cornerstone of hospital costs. In general, the unroofing technique seems to be more advantageous than the others due to lower risks of recurrence, complications, hospitalization periods when compared with flap techniques, and lower work-off periods when compared with primary closure. Even if it is not evaluated in our study, this technique requires longer wound care management than primary closure and flap operations.

Surgical treatment options for pilonidal disease should be evaluated with their potential advantages and disadvantages. Secondary healing after excision requires the formation of granulation tissue. This process involves long-term daily wound care management. Furthermore, recurrence rates are not as low as expected [3,5]. Wound healing after excision and primary closure is rather shorter. On the other hand, complication and recurrence rates seldom reach 40% [5,6]. In the marsupialization technique, the excision is partially closed. Wound healing is also quite long, as is the case in secondary healing. But, both

Table 1. Mean hospitalization periods of patients treated according to surgical options

Method	<i>n</i>	Mean hospitalization period (d)	Mean work-off period (d)
Marsupialization	82	1.54±0.96	20.12±5.10*
Unroofing	20	2.30±1.56	12.60±4.65
Primary closure	29	1.14±0.58	10.72±3.53
Limberg flap transposition	44	3.61±1.08*	13.52±1.78
Total	175	2.08±1.39	16.05±5.73

* $p < 0.001$.

Table 2. Distribution of complications according to surgical methods

Method	<i>n</i>	Infection	Hematoma	Wound dehiscence	None
Marsupialization	82	8	0	0	74
Unroofing	20	2	0	0	18
Primary closure	29	5	0	4	20
Limberg flap transposition	44	2	3	2	37
Total	175	17	3	6	149

the operative period and postoperative complication rates are acceptable [3]. All of these conservative surgery-related outcomes led to the improvement of advanced wound closure techniques, which claim better results. These consist of Z-plasty, rhomboid flap, and other myocutaneous flap advancement techniques. Recurrence rates seem to be decreased by the application of these procedures. However, it should not be forgotten that these procedures are related to longer operative and postoperative hospitalization periods. The possibility of a debilitating complication like flap necrosis should also be considered [7–9]. Even when there was no flap necrosis, hospitalization periods of our patients treated by flap techniques were longer than the others. These data parallel with those in the literature.

The optimal surgical procedure not only cures the case, but also eliminates the risk of a recurrent disease. From this point of view, flap techniques are superior to conservative surgical approaches, as they diminish the necessity of a midline incision and suture materials placed on the midline, flatten the intergluteal groove, and decrease the risk of pilosebaceous infection rates in the operative field. Flattening of the intergluteal groove simplifies hygiene, places the hair follicles away from the midline, and decreases the local trauma and humidity in the intergluteal field, thereby avoiding the risk of a new sinus formation. Recurrence rates following flap techniques are in general below 5% [10–12]. On the other hand, rates for conservative surgical options approximate 50–60% [13,14]. In our series, recurrence rates of primary closure cases were significantly higher than in the other groups.

Physicians treating pilonidal disease should have adequate knowledge of the advantages and disadvantages of the different surgical techniques. Preoperative decision making should be based on the patient's expectations, and cooperation with the patient about possible postoperative complications, and outcomes

with respect to the patient's choice might be the best approach in treating pilonidal disease.

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