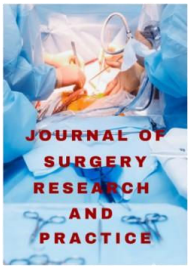

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Research Article

Dufourmentel Flap Surgery in Pilonidal Sinus Disease: Our Late Results

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Abstract

We aimed to present the results of the Dufourmentel flap surgery technique and the parameter findings evaluated in the patients.

Material and Methods: Between August 2015 and August 2020, out of 149 patients who had undergone Dufourmentel flap surgery performed by a single surgeon, 23 were excluded from the control and follow-up and 126 cases were evaluated retrospective.

Results: The mean follow-up period was 30(range 18-42) months. Of the patients, 111(88,1%) were male, 15 females (11.90%) and the mean age was 22,6 (range 15-73) years. A family history was noted in 38(30,2%) of the patients. Various pre-operative interventions had been carried out on 23(18,3%) patients. There were 30(23,8%) patients with a single sinus opening on the midline and 96(76,2%) cases with multiple sinus openings located to the right or left of the midline. Intermittent discharge was detected in 88(69,8%), pain in 18(14,3%) and swelling in 20(15,9%) patients. There were 31(24,6%) patients operated on with acute (0-6 months) disease, 95(75,4%) with chronic disease and 15(12%) with recurrent disease. Surgical complications included 2(1,6%) hematomas, 2(1,6%) wound infections and 2(1,6%) wound dehiscence. Repeat surgery was reported in 6(4,7%) cases. The recurrence rate was (4/111)3,6% only in patients undergoing primary surgery.

Conclusion: The Dufourmentel flap technique is one of the successful method applied in the surgical treatment of chronic pilonidal sinus. This method is reliable in terms of complications and is a good option because of its low recurrence rate.

Keywords: Pilonidal Sinus; Dufourmentel Flap

Introduction

Pilonidal sinus is a common chronic disease of the sacrococcygeal region. This disease was first described by Mayo in 1833 and it was identified as "pilonidal sinus" by Hodges in 1880 [1,2]. Many theories have been put forward to explain the etiology of the disease but the current conclusion is that this disease has an acquired etiology [3]. Its prevalence is 0,7% and males in the 16-25 age group are more affected. Although seen in many tissues, such as in the interdigital areas, axilla, umbilicus and penis, it most commonly involves the sacrococcygeal region [4,5]. Surgical procedures are accepted as the main treatment for this disease. Patients with acute pilonidal disease characterized by the presence of abscess should be treated with incision and drainage, regardless of whether it is a first or recurrent episode. For patients who require surgical intervention for chronic pilonidal disease, excision, primary repair or marsupialization can be performed, based on surgeon and patient preference. Flap-based procedures can also be applied in the treatment of complex and multiple recurrent chronic pilonidal disease, especially when other techniques fail [6]. These include Z-plasty, W-plasty, the V-Y advancement flap, the rhomboid flap, the Dufourmentel Flap (DMLF) the gluteus maximus myocutaneous flap and the fasciocutaneous rotation flap [7]. The rhomboid flap technique is more often preferred than other flap techniques because of its satisfactory results [8,9]. In this study, we present five years results experience of the DMLF closure of the defect after pilonidal sinus excision.

Material and Methods

Between August 2015 and August 2020, a total of 149 patients aged 18 and over were operated on by a single surgeon. While 23 of the cases were excluded from the study due to insufficient control and follow-up and 126 cases were included in the study. Our study is a retrospective. The protocol of this study was approved by the local ethics committee and all patients signed a written consent form. The study was conducted in accordance with the principles in the Helsinki Declaration as revised in 2000. Patient exclusion criteria: Patients with diabetes, immune disease, heart disease and other based disease. The wound was in the acute infection stage. Medical history of malignant tumour, transplanted and mental disease. Age, sex, family history, duration of disease, preoperative intervention, complaint upon admittance, number and localization of sinus openings, early and late complications and recurrence rates were recorded. All patients included in the study had undergone the DMLF surgery technique (Fig. 1). All patients received 1 gr cefazolin sodium iv as a prophylactic 30 min prior to surgery. All patients underwent spinal anesthesia. A closed absorbent drain was placed under the flap. Polyglactin sutures were used subcutaneously, while the skin was closed with polypropylene sutures. The drains were maintained until daily drainage dropped below 20 mL. Sutures were removed after the 10th postoperative day. During the follow-up, oral ampicillin - sulbactam treatment was administered for five days to the patients with wound infection. In patients with abscess or hematoma, these were drained by removing a single suture from the incision. Cases were evaluated in the 1st, 6th and 12th months postoperatively. Subsequent follow-ups were performed by telephone every six months. Duration of hospital stay, presence of wound infection, recurrence and patient complaints (numbness, pruritus, pain) were recorded.

Results

Demographics and follow-up data can be seen in Tables 1 and 2. The mean follow-up period was 30 (range 18-42) months. The patients included 111 males (88,1%) and 15 females (11.90%); 38 (30,2%) patients had a family history. The mean age was 22,6 (range 15-73) years. In 23 cases (18,3%), abscess drainage was performed preoperatively. There were 30 (23,8%) patients with a single sinus orifice at the midline, 42 (33,3%) with multiple sinus openings at the midline and 54 (42,9%) cases with a sinus opening located right or left lateral to the midline. A total of 96 cases (76,2%) had multiple sinus openings located at the midline or right or left lateral to the midline. Complaints upon admission included the presence of discharge in 88 (69,8%) patients, pain in 18 (14,3%) and swelling in 20 (15,9%). Surgery was performed on 31 (24,6%) patients for acute (0-6 months) disease, in 95 (75,4%) for chronic disease and in 15 (12%) for recurrent disease. Of these 15 patients (12 males and 3 females) who presented with recurrence, one of the three women had undergone open surgery and two primary surgery; of the twelve males, three had undergone flap surgery, three open surgery and six primary surgery. The three female patients operated on for recurrence did not undergo repeat surgery, whereas four of the twelve males operated on for recurrence underwent surgery for a third time. Our repeat surgery rate was 2/15 (13.13%) for recurrent disease diagnosed in the patients we operated on. Of the 12 male patients who presented with recurrence, 4 were operated on for a third time. Before us, they had been operated on due to recurrence; the repeat surgery rate was 4/15 (26.66%). Recurrence was detected in 6 (4,7%) cases. Surgical complications included 2 (1,6%) hematomas, 2 (1,6%) wound infections and 2 (1,6%) wound dehiscence. In two patients with recurrence who underwent repeat surgery, complications of wound infection were detected in one case and wound dehiscence in the other. During follow-up, one of the patients with wound site infection underwent repeat surgery. The recurrence rate (4/111) was 3,6% when evaluating only the patients on whom we performed primary surgery. The recurrence rate without any complications was 1,6% (2 patients). During the surgery, eight patients were found to have infected purulent discharge. In one of these eight patients, the discharge continued after the operation and led to recurrence. Complications were summarized postoperatively at the five-year follow-up. Multiple complications may be seen in the same patient; for overall complication rate (Table 2, Fig. 1,2).

Parameters	Data
Demographics	
Age (years) 28,1 ± 2,5	22.6 (16-73)
Sex ratio (male–female)	111 (88,1%) / 15 (11.90%)
Body mass index (kg/m^2)	26.33
Family History	38(30.15%)
Duration of symptoms (months)	0-5 months, 31 (24.60%) 6 - months, 95 (75.40%)
Complaint	

Pain	18 (14,3%),
Swelling	20 (15,9%)
Purulent drainage	88 (69,8%),
Abcess drained	23(18,3%)
Sinus	
Midline Single	30 (23,8%)
Midline Multiple	42 (33,3%)
Lateral Multiple	54 (42,9%)
Type of disease	
Primary	111(88%)
Recurrent	15 (12%)

Table 1: Demographics and parameters in Dufourmentel flap surgery patients.

Complications of Dufourmentel Flap (n: 126)	
Early period 1- 15 days	**Case number (%)**
Seroma	None
Wound dehiscence	2 (1,6%)
Skin necrosis	None
Hematoma	2 (1,6%)
Infection	2 (1,6%)
Late Period	
Recurrence rate at 5 years	6 (4,7%)
Pain	5 (%3,9)
Numbness	11 (8,7%)

Table 2: Overall complication rates for Dufourmentel flap.

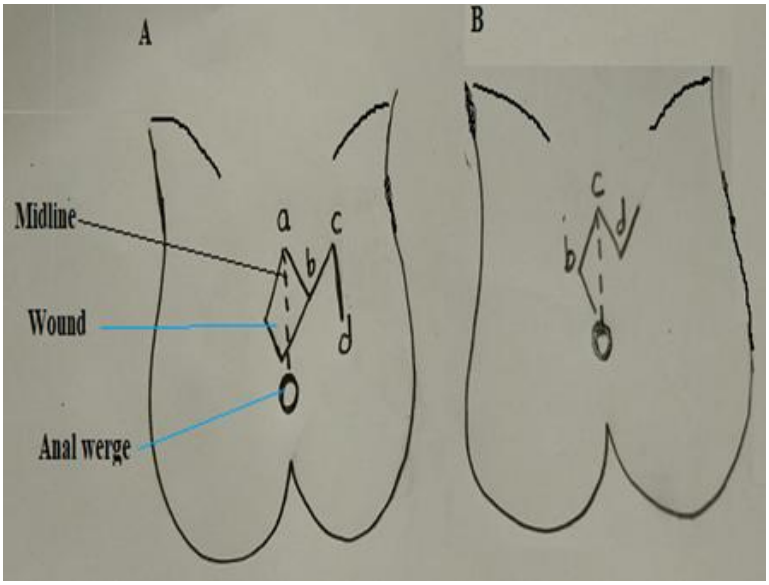

Figure 1: DMLF surgery technique.

Figure 2: Margin of resection was free of neoplasm.

Discussion and Conclusion

Our study highlights four main points. Firstly when BMI, gender and age groups were rewiewed, we found the BMI to be 26,7. Our study found that obesity is a significant contributing factor to PS. Obesity is a risk factor for pilonidal sinus in literature. The reason for this is that in obese cases, there is excess fat tissue in the coccyx region. It causes folds in the skin, causing the hair to be compressed with pressure and friction, thus turning into the skin and causing inflammation. In addition, excessive sweating in obese people increases the risk of PS by increasing moisture in the intergluteal region and creating an ideal environment for bacteria to multiply [10]. Pilonidal sinus affects predominantly men and women in their twenties and thirties [11]. The age distribution of our series (mean 22,6 range 16-73) and male dominance were similar to studies reported in the literature. Although male to female ratio has been found as 10: 1, some authors have reported the male to female ratio as 1: 2 [12,13]. In another study, the disease was 3-7 times more common in men than in women. Becouse their hair tends to be thicker and hairier [14]. We determined that the male: female ratio was found to be 7: 1, in line with the literature.

Secondly We found that congenital factors are also strongly effective in the etiology of PS, in addition to acquired factors. Genetic predisposition is another risk factor for pilonidal disease, as shown by Doll et al., patients with a family history of pilonidal disease have earlier symptomatic disease than patients without a family history. They also suggested that people with a positive family history be closely monitored for pilonidal sinus, showing that family history also increases the risk of postoperative recurrence of the disease. Genetic susceptibility is another risk factor for pilonidal disease, as was shown in a Doll, et al., patients with a family history of pilonidal disease have earlier symptomatic disease than patients without a family history [8]. Family history has been revealed as an important predisposing factor for PS. This study as a whole detected 38 (30,2%) patients with a family history of the disease. Family history was present in 5 (33.33%) of the 15 cases who presented to our clinic because of recurrence. It was found that 2 (33.33%) of the 6 cases of postoperative recurrence had a family history. Based on this information, we recommend that cases who had been operated for PS and have a family history should be followed ore carefully in terms of recurrence.

Thirdly we found that there was less infection and less hematoma in our cases compared to literature. But recurrens rates similar literatüres. Recurrence of this disease and non-healing advanced disease are difficult to treat and often require extensive excision and flap methods of treatment. Therefore, techniques have been developed that include obliteration of the natal cleft such as Z-plasty, V-Y advancement and rhomboid flaps and primary skin grafts [19,23]. Flap shifting has many advantages over these

methods. The aim is to smooth the intergluteal sulcus. Among the flap methods, the most widely used and popular of the rhomboid flaps are the Limberg and its partially modified D-DMLF. The mean duration of hospital stay is 5 days and the recurrence rate is reported to be between 0% and 5% [24]. Surgical treatment using a flap is performed without tension. Stressed closure is also an important predisposing factor for recurrence. The medial of the flap can be rotated to eliminate dead spaces. Unilateral flaps can close defects of 8–10 cm in diameter, while bilateral flaps may cover 10cm defects. Recurrence rates of 0-9,5% have been reported in various series [25]. In a number of Z-plasty series, wound infection was reported in 2,5-18,4% and recurrence in 0-1,7% [26]. In one study, the recurrence rate was 4% in the DMLF group [12]. The surgical complications seen in our study included 4,7% recurrence (6 cases) and 1,6% wound dehiscence (2 cases). In some studies, different rates were found: 2,6% dehiscence (wound opening); 5,2% infection; 2,9% seroma or hematoma; 2,3% and 7% recurrence [27]. In our study, 2 (1,6%) hematoma cases and 2 (1,6%) wound infection cases were detected. Our rates were similar to those reported in the literature, but our infection and hematoma rates were lower. This difference was attributed to the wider base of the DMLF method, which provides better blood flow to the flap and less tension.

Fourthly multiple sinüs patency may be a risk factor for recurrence. All of our recurrance cases had multiple sinus patency. Can multiple sinuses be a predisposing factor for recurrence? Of course, we believe that a larger, randomized controlled trial is needed. İn the literature, recurrent abcess drainage and postoperative wound infection have been identified as risk factors for recurrance [29]. In our study, early and late complications were seen at a low rate. In chronic disease, continuous discharge is an important factor for recurrence. It was found that three (50%) of our recurrent patients had continuous discharge. No information relevant to this was found in the literature. Complications such as infection, hematoma and wound dehiscence also have a significant effect on recurrence. In our study, the recurrence rate in patients who did not have surgical complications after primary surgery (1.62%, 2 cases) was very low. Recurrance occured in only 6 (4,7%) causes out of 126 cases. Multiple sinüs tracts were present in 96(%76,1) of them The DMLF tecnique allows the removal of all sinuses by removing tissue in a rhombus shape. İn addition, the defect is closed without tension, allowing better blood supply to the flap.

Numerous techniques have been developed for the treatment of sacrococcygeal pilonidal disease. There are significant differences among the various flap techniques. A larger series and longer follow-up is required to reveal a true picture of recurrence following the application of the Dufourmentel flap technique.

Limitation of our study DMLF would result in a very large wound with unnecessary removal of large areas of healthy tissue poor cosmetic results. Therefore, DMLF is one technique used in advanced, difficult cases of pilonidal sinus disease. It is a reliable and successful method of surgical treatment and with its low recurrence rate can be a treatment of choice.

Conflict of Interest

The authors declare no conflict of interest.

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