

Secondary Healing versus Delayed Excision and Direct Closure after Incision and Drainage of Acute Pilonidal Abscess: A Controlled Randomized Trial

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Abstract

Objective: To compare drainage and healing by secondary intention with drainage, delayed excision and direct closure (DE/DC).

Methods: Between January 2003 and January 2010, 130 patients admitted with an acute pilonidal abscess were randomized to undergo either elliptical incision and drainage (I&D) and healing by secondary intention (Group 1, n=66) or I&D and DE/DC (Group 2, n=64). Data regarding patient and sinus characteristics, hospital stay, healing time, postoperative complications, and recurrence were prospectively collected. Patients were followed-up for a mean of 62.4 months.

Results: Ninety percent of patients were men and 10% were women, with a mean age of 26.4 years and a mean body mass index of 31.5. There was no difference in hospital stay between both groups. Mean healing time was significantly ($p=0.035$) longer for patients in group 1 (32.2 days), compared to those in group 2 (10.7 days). Group 1 patients had significantly fewer postoperative complications (4.5% versus 17.2%, respectively) ($p=0.020$). The 2 groups had a similar recurrence rate of a pilonidal abscess (6.1% versus 6.3%, $p=0.984$), and a rate of development of a chronic pilonidal sinus (PNS) (25.8% versus 23.4%, $p=0.840$).

Conclusions: Although there is more rapid healing and fewer visits for dressing with I&D and DE/DC of an acute pilonidal abscess, this is accompanied by a significantly higher overall complication rate than with I&D and secondary healing. Recurrence of an acute abscess or development of a chronic pilonidal sinus is similar with both procedures.

Key words: Pilonidal abscess, drainage, delayed excision, direct closure, recurrence

Introduction

Pilonidal disease can present acutely as an abscess with or without associated cellulitis. Approximately 60% of those presenting with an abscess at an initial episode and treated with a simple incision and drainage (I&D) will heal without the need for

further intervention [1]. The remainder of patients will need a more definitive excision to address hypertrophic granulation tissue before closure. Even after complete healing, 10% to 15% of patients will have recurrence [1]. Curettage of the cavity at the time of I&D is controversial, though Matter et

al.[2] reported greater complete healing (96% versus 79%) and lower incidence of recurrence (10% versus 54%), compared with no curettage. Another issue at acute presentation is whether to excise the midline pits at the time of I&D in an attempt at eliminating future disease. This practise, however, has not been shown to increase the rate of healing, decrease hospital stay, or decrease the rate of recurrence [2].

The present prospective controlled randomized trial (CRT) was conducted to compare I&D of an acute pilonidal abscess and healing by secondary intention with I&D, delayed excision and direct closure (DE/DC).

Materials And Methods

Study Design

The present study was designed as a single-blind, prospective CRT and the Ethics Committee of our Secondary Care Hospital approved the protocol. Patients were randomly assigned to undergo I&D and either healing by secondary intention or DE/DC, and were blinded as to the type of procedure performed. Randomization was performed in the outpatient department, according to a computer-generated schedule with individual assignments concealed in sequentially numbered closed envelopes that were opened in order when assignments were made.

Study Population

Candidates for the study were consecutive patients with an acute pilonidal abscess as first presentation requiring I&D, admitted to the hospital from January 2003 to January 2010. All subjects who agreed to participate in the study gave written informed consent. Patient disposition is shown in Figure 1. Exclusion criteria were previous pilonidal abscess surgery, diabetes mellitus, renal failure, immunosuppression, and children (<16 years). A total of 130 patients fulfilling the criteria completed the study. They were randomized for treatment with I&D and either healing by secondary intention (Group 1, n=66) or DE/DC after 2-3 weeks (Group 2, n=64). The majority of patients (86.2%, 112/130) had a pilonidal abscess as the first presentation, while 13.8% had a previous excision of a chronic pilonidal sinus (PNS). There were 117 men (90%) and 13 women (10%). Their ages ranged between 16 and 39 years with a mean of 26.4 years. Body mass index (BMI) was used as an objective indicator of obesity, according to the WHO anthropometric criteria for health, as follows: a BMI of 25-29.9 is overweight (grade 1), 30-39.9 is obesity (grade 2)

and ≥ 40 is morbid obesity (grade 3). The mean BMI of the study population was 31.5 (range 23.6-41.9) [3].

Data Collection

All data was collected prospectively and included patient demographics and clinical presentation (symptoms, location of the abscess and pits, associated cellulitis), an operative technique and post-operative course, including duration of hospital stay, time needed to resume work or daily activities, post-operative complications, and failure of treatment defined as recurrence of an acute pilonidal abscess or development of chronic disease.

Surgical Procedure and Post-operative Regimen

Surgery was performed under general anesthesia (patient preference / cultural factor) with the patient positioned on the affected side with elevation of the other buttock, or prone if the abscess was midline. One dose of intravenous second generation cephalosporin was given to all patients with induction of anesthesia. A light shave over the area is performed. An elliptical incision is made; the abscess cavity is drained and irrigated with normal saline, and then a gauze dressing is applied. Patients were usually discharged the following day with regular outpatient appointments. Patients in Group 1 were left to heal by secondary intention, while those in Group 2 underwent DE/DC within two to three weeks following I&D.

Post-operatively, patients in both groups were allowed an adequate dose of oral analgesic (acetaminophen) every 4 hours and were allowed an intramuscular injection with Pethidine (1 mg/Kg), as requested. Post-operative antibiotics were not prescribed for any patient unless there was associated cellulitis. Patients were instructed to adhere to hygiene measures with showers and a towel to rub away loose hairs, and to undertake hair depilation to prevent small hairs making their way to the cavity or overlooked small pits. Follow-up visits were scheduled at regular weekly intervals for the first month post-operatively, and at 3-month intervals thereafter for 12 months. Patients were then reviewed yearly or earlier in case of recurrence of symptoms. Mean follow-up was 62.4 months (range 14-96 months). At each follow-up visit, assessment included physical examination and monitoring of post-operative complications and recurrence.

Statistical analysis

Statistical analysis was performed using the SPSS/PC version 13 computer software (Prentice-Hall; Chicago, IL).

The student's t test was used to compare the mean values between the two groups. The Chi square test (X^2) with Yate's correction was used for comparison between categorical qualitative values. Fisher's exact test was used for comparing recurrence between the two study groups. The 5% level was set as the level of significance.

Results

Symptoms were relieved in all patients, who resumed their normal activities within 1-2 weeks. As seen in Table 1, patient characteristics and clinical presentation, including age and gender, were similar between both groups, with no statistically significant differences between them. Approximately, half of the patients in each group were obese and smokers, and three quarters were "hirsute" (75.8% versus 75%, respectively) [4]. All patients had no previous pilonidal abscess surgery. Associated cellulitis was present in the majority of patients in each group (74.2% versus 79.7%, respectively), and abscesses were located in the midline in nearly half of the patients in either group (59.1% versus 50%, respectively).

Table 1. Patient Characteristics and Clinical Presentation in Both Groups Studied

Characteristic Features	Group 1 (n=66) Secondary Healing	Group 2 (n=64) DE/DC	p-Value
Age (Years)			
- Mean	27.1	25.8	
- Range	18-37	16-39	0.187*
Gender			
- Male	58 (87.9%)	59 (92.2%)	
- Female	8 (12.1%)	5 (7.8%)	0.413**
Obesity			
- Overweight (BMI 25-29.9)	37 (56.1%)	40 (62.5%)	
- Obesity (BMI 30-39.9)	21	27	
- Morbid obesity (BMI \geq 40)	13	12	0.455**
- Hirsute Nature	3	1	
Hirsute Nature	50 (75.8%)	48 (75.0%)	0.920**
History of Smoking	34 (51.5%)	31 (48.4%)	0.726**
Clinical Presentation			
- Acute Abscess	17 (25.8%)	13 (20.3%)	
- Acute Abscess + Cellulitis	49 (74.2%)	51 (79.7%)	0.461**
Location of the Abscess			
- Midline	39 (59.1%)	32 (50.0%)	
- Off-Midline	25 (37.9%)	29 (45.3%)	
- Both	2 (3.0%)	3 (4.7%)	0.298**

PNS, pilonidal sinus. All differences were not statistically significant ($p > 0.05$) using *t*-test* or Chi square test (X^2)**.

Table 2 shows that the two groups did not differ significantly from each other regarding hospital stay and time to return to work or normal physical activity. Mean healing time was significantly (*t* test=30.7, $p=0.035$) longer in group

1 patients with secondary healing than those in group 2 patients with DE/DC (32.2 days versus 10.7 days, respectively). Overall complications were significantly ($X^2=5.40$, $p=0.020$) less in Group 1 patients (4.5%), as opposed to those in Group 2 (17.2%). Wound infection \pm partial wound dehiscence occurred in 8 patients belonging to Group 2, compared to only 2 in Group 1. All cases in both groups were treated conservatively and subsequently healed within 2-3 weeks.

Table 2. Postoperative Course and Complications in Both Groups Studied

Post-operative Course and Complications	Group 1 (n=66) Secondary Healing	Group 2 (n=64) DE/DC	p-Value
Hospital Stay (Days)			
- Mean \pm SD	1.3 \pm 0.5	1.2 \pm 0.4	
- Range	1-2	1-2	0.932
Mean Healing Time (Days)	32.2 \pm 9.8	10.7 \pm 3.4	0.035*
Return to Normal Activity (Weeks)	1-2	1-2	0.831
Complications	3 (4.5%)	11 (17.2%)	
- Seroma	0	2	
- Wound infection	2	3	
- Partial wound dehiscence	0	3	
- Infection + dehiscence	0	2	0.020**
- Bleeding	1	1	
Treatment Failure	21 (31.8%)	19 (29.7%)	0.851
Recurrence of acute abscess	4 (6.1%)	4 (6.3%)	0.984
Development of chronic PNS	17 (25.8%)	15 (23.4%)	0.840

PNS = Pilonidal sinus

* Statistically significant difference (*t*-test=30.7, $p=0.035$)

** Statistically significant difference ($X^2=5.40$, $p=0.020$)

Difference in the recurrence rate of a pilonidal abscess was not statistically significant ($p=0.984$) between the two groups (6.1% versus 6.3%, respectively). The rate of development of chronic PNS did also not differ between both groups (25.8% versus 23.4%, respectively) ($X^2=0.943$, $p=0.840$). The failure rate was thus similar between the two groups (31.8% versus 29.7%, respectively) ($X^2=0.692$, $p=0.851$).

Discussion

A pilonidal abscess is one of the most common complications of pilonidal disease. The painful nature of the condition causes significant morbidity with often a protracted loss of normal activity [5]. The natural depth of the natal cleft is very

vulnerable to hair insertion because of a number of characteristics that vary widely from one person to another, according to age, gender, race, body constitution, and the type of surgery performed previously [6,7]. The most obvious contributing factors to the development of a pilonidal abscess observed here were the hirsute nature (abundance of body hair) of the population, increased sweating associated with sitting and buttock friction, poor personal hygiene, and obesity, which results in increased depth of the natal cleft, increased friction, and a tendency to softness and maceration in depth [8]. Hair inserted into the natal cleft acts as a foreign body causing an inflammatory reaction and edema resulting in occlusion of the mouth of the pit, subsequent infection and abscess formation. It also prevents spontaneous recovery, delays recovery of any wound in the depth of the natal cleft and is the main cause of recurrence [9].

Despite the variety of surgical techniques proposed for the treatment of an acute pilonidal abscess, the best method is still controversial [6]. The main goals of surgery are to establish complete and rapid post-operative healing, to minimize complications and to prevent recurrence. To the best of our knowledge, the present study is the first prospective CRT, over a mean follow-up period of more than 5 years that compares healing by secondary intention with DE/DC after I&D of the acute pilonidal abscess. Results showed that neither of these two procedures offers any advantage over the other in terms of duration of hospital stay, time needed to return to normal physical activity, or the necessity of further intervention due to recurrence, whether in the form of an acute abscess or chronic PNS. As expected, time needed for wound healing was significantly shorter with DE/DC; however, this was achieved at the expense of having a higher overall postoperative complication rate.

Jensen and Harling treated 73 consecutive patients with simple I&D under local anesthesia for a first-episode acute pilonidal abscess with a mean follow-up of 60 months, and reported that 31 patients (42%) required definitive surgical treatment later [1]. Hanley on the other hand preferred open drainage followed by definite excision [10]. Shiptz et al. recommended a single stage treatment by diathermy excision and secondary healing, with a reported recurrence rate of 20.9% [11]. However, the length of time required to achieve acceptable wound healing decreases this method's effectiveness to some extent. A single-step radical treatment of a pilonidal abscess has also been performed in 43 patients by Licheri et al., using drainage, curettage and marsupialization. They re-

ported a failure rate (persistent sinus or recurrence) of 18.7% and complete healing within 4-10 weeks in 95.3% [12].

Hosseini et al. compared drainage, delayed excision and primary closure with excision and secondary healing in the management of 76 patients with a pilonidal abscess, and reported a significantly higher one-year recurrence rate with primary closure. The rate of recurrence with drainage of an acute pilonidal abscess and primary wound closure ranged between 14% and 38% [6]. In the present study, the overall recurrence rate, over a mean follow-up of 62.4 months, with I&D and secondary healing versus I&D and DE/DC was 31.8% and 29.7%, respectively. Recurrence, in the form of an acute pilonidal abscess, was also similar between both groups, being as low as 6.1% and 6.3%, respectively. Similar low recurrence rates were reported by several authors with skin excision (unroofing) and curettage for the treatment of an acute pilonidal abscess [5,13,14]. In comparison with I&D, Vahedian et al. reported a significantly lower recurrence rate with unroofing and curettage (11% versus 42%) [5]. However, Eryilmaz et al. reported that 24% of their patients who underwent unroofing and curettage developed chronic PNS [13].

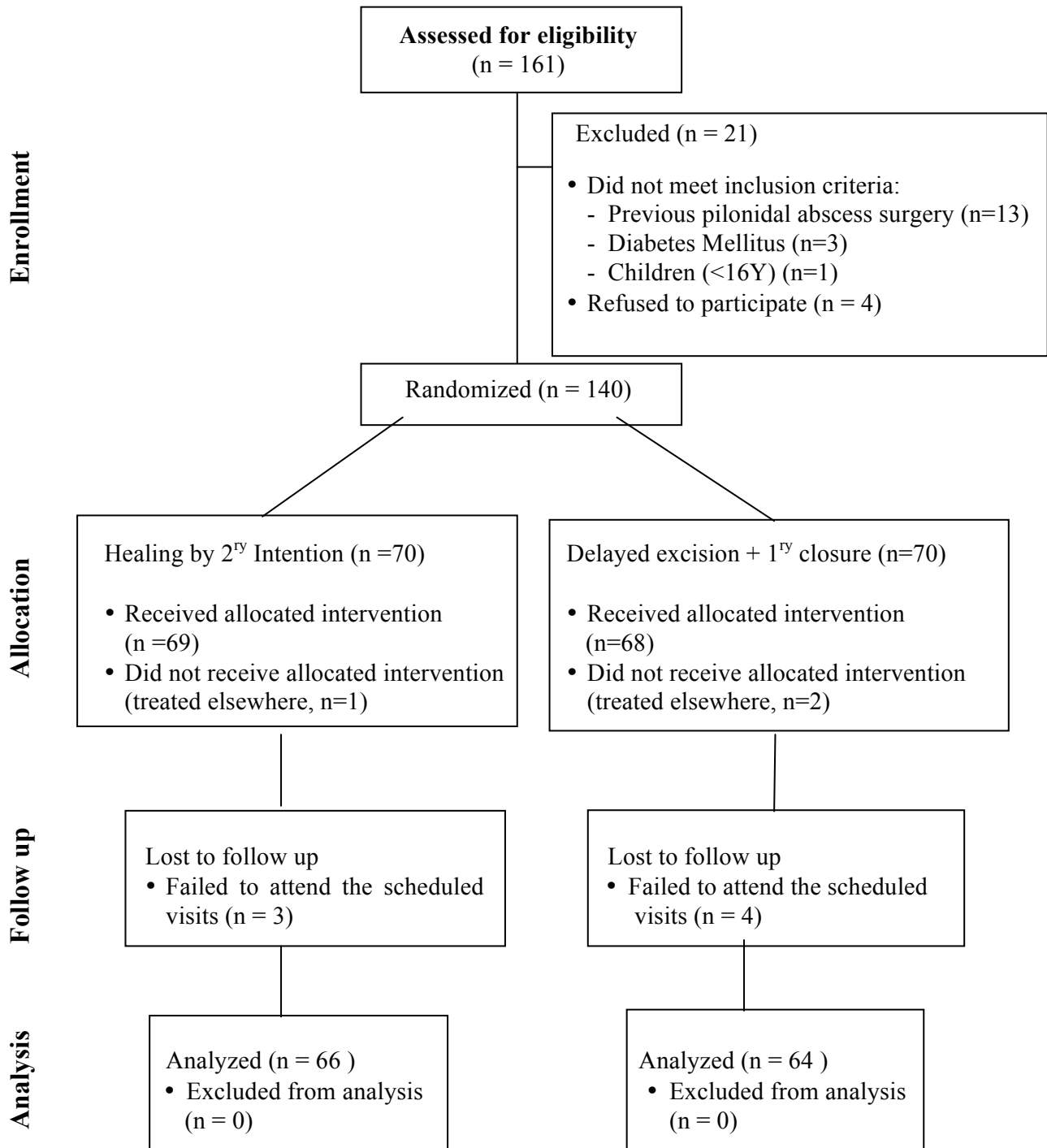
Similar to chronic PNS, it seems that despite the various surgical techniques available for the management of an acute pilonidal abscess, controversy concerning the optimal surgical approach persists. Optimizing the healing process and minimizing recurrence (and complications) remain a challenge. Other studies on a larger number of patients and including other procedures for comparison, such as "single-step radical treatment", are warranted.

Based on the data presented, it may be concluded that although there is more rapid healing and fewer visits for dressing with DE/DC following I&D of an acute pilonidal abscess, this is accompanied by a significantly higher overall complication rate than with I&D followed by secondary healing. Recurrence of an acute abscess or development of a chronic pilonidal sinus is similar with both procedures. It is conceivable that treatment should be tailored according to the patient's clinical condition, socio-economic and working situation.

Conflict of interest statement

The authors declare that they have no conflict of interest.

Figure 1. Patient flow diagram



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