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Original article

SURGICAL TREATMENT OF SACROCOCCYGEAL PILONIDAL SINUS WITH THE LIMBERG FLAP: REVIEW OF 81 CASES.

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Summary

Pilonidal sinus disease is a complex condition that causes both discomfort and embarrassment to sufferers. Direct cost through absence from work is high. Controversy still exists regarding the best surgical technique for its treatment in terms of minimizing disease recurrence and patient discomfort. Thus, we conducted this study to evaluate the results of rhomboid excision and Limberg flap reconstruction in the surgical treatment of pilonidal sinus disease. This prospective study included 81 patients who had pilonidal sinus and were treated by the rhomboid excision and Limberg flap. The mean follow–up was 18 months and all patients were satisfied with the procedure. There were lower complication rates, minimal discomfort, patients discharged in 2-3 days and only two recurrences. The authors recommend the Limberg Flap procedure for pilonidal sinus disease. It is effective, with short hospitalization, low recurrence rate and shorter time off work.

Introduction

Pilonidal sinus disease is a common medical condition that accounts for almost 15% of anal suppuration and is responsible for significant morbidity [1]. It is usually seen in young adults [2]. Males are affected more frequently than females by a ratio of 3:1, probably due to their more hirsute nature [3]. The origin of pilonidal sinus disease is not fully understood. There are many theories associated with its pathogenesis: The most important are the acquired and the congenital theories. However, the majority of opinion favors the acquired theory, which postulates that the sacro-coccygeal pilonidal infection originates in the natal cleft hair follicle that has become distended with kera-

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tin [4-5]. Thus, for treatment and prevention, the causative factors must be eliminated [6]. Several treatment modalities have been advocated for pilonidal sinus disease, including shaving, incision and drainage, excision with primary closure, excision with open packing and recently rhomboid excision with flaps surgery [7].

This study was carried out to evaluate the results of Rhomboid excision and Limberg flap reconstruction in terms of hospital stay, time to heal, recurrence rate, missed days off- work and finally patient satisfaction.

Methods

This work was conducted in a surgical unit of two Lebanese general hospitals from Mars 2008 to February 2014. It included 90 patients. Age, sex, clinical presentation, complications, inpatient stay and outcome were recorded. Nine patients had no follow up, disappeared and were excluded from this study resulting in 81 patients who were treated by rhomboid excision and flap reconstruction (Limberg flaps).

The patients who had pilonidal abscess were first managed by incision and drainage, followed later on by a definitive surgery. The operations were performed under either general or spinal anesthesia. All patients were placed in prone position with buttocks strapped for wide exposure. After scrubbing and draping, the

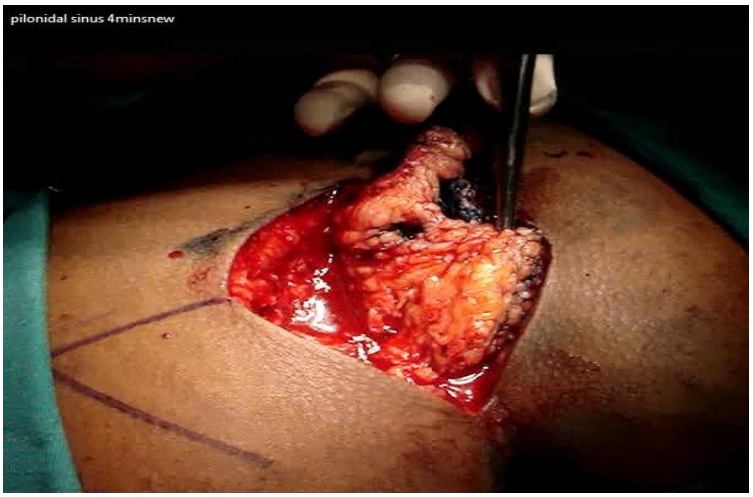

Figure 1a. Rhomboid-shaped excision

Figure 1b. Rhomboid-shaped excision that includes the sinus till the presacral fascia

area to be excised was marked and the flap lines delineated (Figure 1a).
Methylene blue dye was injected through the sinus opening and antibiotics were administered intravenously at the induction time of anesthesia, then twice daily for two days followed by oral antibiotics for eight days. Thereafter, patients were reviewed at 2 - 4 weeks interval. Outpatient follow-up continued for 18 months to exclude or identify recurrence. A rhomboid-shaped excision was carried out, with equal size on both sides and included the sinus till the presacral fascia (Figure 1b). A right or left sided Limberg transposition flap, reaching the gluteus maximus fascia, was fully mobilized on its inferior edge and transported medially to fill the rhomboid defect (Figure 2). Hemostasis was achieved by the use of electrocautary.
A suction drain was inserted in the wound cavity through a separate stab incision. The subcutaneous tissue was approximated with interrupted 2^0 vicryl, and the skin was closed with *interrupted* 3^0 nylon (Figure 3). Drain was removed after 48-72 hours. Finally, alternate sutures were removed on the 12^{th} postoperative day, and the rest of the sutures were removed on the 14^{th} day.

Figure 2. Limberg transposition flap mobilized to fill the rhomboid defect

Figure 3. Skin closure using nylon sutures

Results

This study included 90 patients (62 male and 28 female) that were operated by rhomboid excision and Limberg reconstruction but nine patients were excluded due to loss of follow-up. Among the resulting 81 patients, 57 were males and 24 females with a ratio of 2.3 to 1. The mean age at presentation was 25.5 years (range 17-69). Eight patients presented with recurrent sinus (9.9%), 52 patients presented with discharge (64.2%), 14 with pain (17.3%) and 7 with pilonidal abscess (8.6%) (Table 1).

The operative time ranged from 55 to 85 minutes. Seroma developed in 5 patients (6.17%) that were managed by conservative measures, three patients developed infection (3.7%) and were treated with antibiotics, two patients had necrosis at the tip of the flap (2.47%) and also two patients had recurrences (2.47%) at 5 and 7 months postoperatively (Table 2). In addition, the time off-work ranged from 10-15 days while the time to walk without pain ranged from one week to two weeks (Table 3).

Discussion

Sacrococcygeal pilonidal sinus can be a chronic and recurring condition which is sometimes difficult to cure [1]. Although many surgical treatment methods have been described, the ideal treatment method has not yet been established for pilonidal disease. In fact, few surgical treatments provided long-term good results. Excision and packing, excision and primary closure or flap technique (Limberg) are surgical procedures that have been postulated for treatment of pilonidal sinus. These procedures reflected the need for a safe and efficient surgical method for this disease. The traditional method of wide excision and lay open the sinuses resulted in a hospital stay of 5-14 days, healing time of 6-10 weeks, and recurrence rate of 8%-21%

Complaint	Number of patients	Percentage
Recurrent sinus	8	9.9%
Pain	14	17.3%
Discharge	52	64.2%
Abscess	7	8.6%

Table 1. Clinical presentation of the patients

Complications	Number of patients	Percentage
Seroma	5	6.17%
Infection	3	3.7%
Necrosis	2	2.47%
Recurrence	2	2.47%

Table 2. Postoperative complications

Clinical outcomes	Days
Time off-work	10-15
Pain	7-14
Hospital stay	2-3
Healing time	12-14
Drain removal	2-3

Table 3. Clinical outcome s

[1-8]. They were followed by prolonged morbidity with an open granulation wound [9, 10]. The resultant scar was broad, adherent to the sacrum and frequently broken down. Previous attempts to improve these results by various methods of primary closure reduced the healing time to less than 2 weeks, but hospitalization remained almost the same, between 7-10 days, and recurrence rate varied between 8%-30% [11-13]. Such data appeared favorable for the primary closure approach. However, a high complication rate had been reported because of tissue tension [6]. Moreover, recurrence remains the main problem associated with this surgical procedure and range from 21.4% to 40% in some other studies [14, 15]. On the other hand, the flap technique (Limberg) had been associated with lower complication and recurrence rates.In this study, 81 patients with sacrococcygeal pilonidal pathology were managed with rhomboid excision and Limberg flap reconstruction. The average hospital stay was 2.2 days; shorter than any other procedure (5-14 days). The healing time was 2 weeks instead of 6-10 weeks and recurrence were noted in only 2 patients (2.47%). Akein et al reported a recurrence rate of 2.91% and Ertan of 2%. Necrosis was detected in 2 patients (2.47%), which may be due to faulty technique and lack of experience at the beginning of this study or to the formation of thrombi at the level of the surgical anastomosis as reported by Montesano et al [16]. Time-off from work was 10 to 15 days, significantly shorter compared to those treated with primary closure (14-25.5) [17-19]. This shorter duration was similar to that reported by other authors [20, 21]. Concerning the time to walk without pain, it ranged from 7-12 days in the Limberg flap. However, excision with primary closure caused restriction of activity because of tissue tension [22]. Most complains by the patients after pilonidal sinus surgery were caused by wound tenderness. Holm and Hulten reported that patients treated with the flaps method were found to walk without pain earlier than patients treated with primary closure [23]. Some authors believed that the primary closure was more comfortable in small defects. Healing time was shorter after excision and closure, but more recurrence occurred compared with Limberg flap [24, 25]. Leventgolu et al showed that the Limberg flap procedure was effective, with low complication rates, shorter time of returning to normal activity and shorter hospitalization [26]. Mahdy observed also in his study that wound infection and dehiscence were 11.6% and 6.7% respectively in primary closure group and 1.68% in Limberg flap group with no recurrence in his series [8]. Moreover, Ertan determined a recurrence rate of 2% in the Limberg flap method and 12% in the primary closure procedure and stated that Limberg flap resulted in a better outcome with respect to recurrence, complications, time required for wound healing, off work time and general health conditions [18]. However, he suggested that the Limberg flap treatment must be reserved for patients with problematic pilonidal disease in term of chronicity or failure to heal following excision [18]. Muzi et al showed that there is approximately 16% failure of healing with the procedure of excision and primary closure. This failure results from the fact that a primary closure is rarely completely free of tension and the recurrence rate was as high as 38% [27]. However, for insulin dependent diabetes mellitus, Rashidian et al. noticed that they had higher complication rates with the flap method and suggested to excise the pilonidal sinus and lay it open [28]. Moreover, it is recommended, for patients who had suspected carcinoma in the sacrococcygeal sinus, to do a frozen section in order to confirm that the margins were free of the disease, before any local flap was used to cover the area [29]. In brief, an ideal operation should minimize financial cost, allow patients to return quickly to work, inflict minimal pain with low recurrence rate. Hence, the current study highlights and reinforces previously published series that demonstrated the safety and the efficiency of Limberg flap reconstruction for pilonidal sinus disease compared to other surgical techniques.

Conclusion

Pilonidal sinus disease is a complex condition that causes both discomfort and embarrassment to sufferers and physicians. However, with the Limberg flap method, both the patient and physician are more satisfied. The Limberg flap method has many advantages as it is easy to perform; it flattens the natal cleft with large vascularized pedicle and is sutured without tension. It is useful in both primary and recurrent diseases, with very low complication and recurrence rates; shorter hospitalization, earlier healing and shorter time off-work. In addition, the technique has a satisfying esthetic outcome. So, the authors highly recommend the use of Limberg flap reconstruction for pilonidal sinus disease because its results were superior to other techniques mentioned in the literature.

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