Long-Term Results of Limberg Flap Procedure for Treatment of Pilonidal Sinus
A Report of 200 Cases

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PURPOSE: In the past, various methods of surgical or nonsurgical treatment of sacrococcygeal pilonidal sinus have been used. The most common problem in the treatment of this disease is recurrence. In the present study, our aim was to determine the long-term results of the Limberg flap procedure. METHODS: We present 200 consecutive patients with pilonidal sinus who underwent the Limberg flap procedure between 1992 and 2001. Twenty-six (13 percent) of the 200 patients were operated on because of recurrent pilonidal sinus. Under general or local anesthesia, all sinus tracts were resected en bloc, and the Limberg flap was prepared from the gluteal region. We used a suction drain. We met all patients and recorded their complaints and complications of treatment. RESULTS: Five sinuses recurred (2.5 percent). Minimal flap necrosis occurred in only six patients (3 percent). In three patients (1.5 percent), seroma developed. Wound infection occurred in three patients (1.5 percent). The mean hospital stay was 3.1 days, whereas the mean time to return to work was 12.8 days. CONCLUSION: The Limberg flap procedure is a good treatment choice for pilonidal sinus because of its low complication rate, the short time to return to normal activity, and good long-term results. This procedure has good postoperative results and is a comfortable surgical method for the patient. [Key words: Pilonidal sinus; Treatment; Limberg flap]


Pilonidal sinus disease is a common condition that is seen mainly in young adults1 and occurs often on the intergluteal groove. However, it has also been reported in the penis, axilla, perineal, and suprapubic area, the periumbilical zone, between the fingers of the hand, and in the ends of amputated extremities.2,3 There are many theories about the cause of this disease,4,5 such as the congenital theory or the acquired theory. Because it is nearly impossible to prevent, treatment is more important than these theories. Many surgical techniques are used to treat pilonidal sinus, such as marsupialization, excision and primary closure, Z-plasty, simple V-Y advancement flap, and Limberg flap closure.6–9 Presently, recurrence is the major problem for all of the treatment procedures. The ideal surgical treatment of pilonidal sinus should result in the patient’s comfort and provide a high chance of cure with a low recurrence rate. The recurrence rate after surgical treatment of pilonidal sinus varies from 3 to 25 percent.3 In the present study, we aimed to determine the long-term results that we have achieved since 1992 using the Limberg flap procedure.

PATIENTS AND METHODS

We present 200 consecutive patients with chronic pilonidal sinus who underwent surgical treatment using the rhomboid excision and Limberg flap procedure between 1992 and 2001 in the Surgery Department at Bayindir Hospital in Ankara, Turkey. One hundred seventy-four (87 percent) of the patients were males. The mean age was 23 (range, 18–46) years. Clinical presentation included pilonidal abscess (64 cases, 32 percent), sinus with chronic suppurative discharge (92 cases, 46 percent), and simple noninfected sinus with minimal discharge (44 cases, 22 percent). Preoperatively, the infected sinuses were treated with antibiotics according to cultures and antibiotic sensitivities. Pilonidal abscesses underwent simple incision and were treated with antibiotics before the surgical procedure. Six weeks after this application, the patients underwent surgery as though they were chronic cases. For this reason, they were not separated into two groups as chronic and acute.

Twenty-six (13 percent) of 200 cases underwent surgery because of recurrent pilonidal sinus. Half of these patients had undergone surgical intervention.
because of two or more recurrences. Because *Staphylococcus aureus* is a common infectious agent after pilonidal sinus surgery, all patients received cefuroxime sodium (1,500 mg intravenously) for prophylaxis immediately before the operation began.

**Operative Technique**

Under general (98 percent) or local (2 percent) anesthesia (the types of anesthesia were chosen according to the patient’s request), the patients were placed in a jackknife position. The natal cleft was shaved and disinfected with povidone iodine solution and covered with sterile gauze. Methylene blue was injected through the sinus tracts to mark all branches of the sinus. All sinus tracts were resected *en bloc* with a rhomboid excision (Fig. 1). Then, a Limberg flap was prepared from the right or left gluteal region (Fig. 2). The flap included the skin, subcutaneous tissue, and fascia of gluteal muscle. After careful hemostasis, a suction drain was placed on the presacral fascia (in all patients except 8 who had sinuses smaller than 3 cm). Subcutaneous tissue was approximated with polyglactin (Vicryl®, Johnson & Johnson, Edinburgh, United Kingdom) sutures. The skin was closed with polypropylene sutures or skin staplers (Fig. 3). The drains were removed after drainage decreased to under 30 ml/day. In general, we removed drains on the second postoperative day. On the fifth postoperative day, patients were called for control purposes, and on the tenth postoperative day, the sutures were removed. We contacted all patients in the first, sixth, and twelfth months to inquire about their complaints and satisfaction with treatment. After the first year, patients were contacted by phone and asked whether they had any problems. Finally, we interviewed all patients by phone in January 2003. The mean follow-up time was 5.1 years. The wound infection rate, time to complete healing, time to return to work, and recurrence rate were recorded.

**RESULTS**

With this technique, which we used on 200 patients between 1992 and 2001, there were neither anesthetic nor surgical deaths nor major complications such as cardiac or pulmonary problems. Sinuses recurred in five patients (2.5 percent) who underwent the Limberg flap procedure. One of these five patients also had a seroma; in the other four cases, no complication that could cause a postoperative recurrence was observed.

Minimal flap necrosis occurred in only six patients (3 percent), and no surgical or medical intervention was necessary. This necrosis was observed at the end of the upper flap in all of the patients. In three patients (1.5%), seroma has been observed under the flap.