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Comparison of modified Limberg flap transposition and lateral advancement flap transposition with Burow's triangle in the treatment of pilonidal sinus disease

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Pilonidal sinus disease;
Lateral advancement;
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Abstract

BACKGROUND: Although many options exist for surgical treatment of pilonidal sinus disease (PSD), consensus has not yet been achieved, as all surgical methods have various rates of complications, postoperative infection, and recurrence.

METHODS: This study was a prospective, randomized, clinical trial, and was conducted with consecutive 100 patients admitted to Ankara Military Hospital General Surgery Service for treatment of PSD from May 2013 to August 2013. This study compared two surgical treatments for PSD: modified Limberg flap transposition and lateral advancement flap transposition with Burow's triangle.

The patients received surgical treatment with either modified Limberg flap transposition (n = 50) or lateral advancement flap transposition with Burow's triangle (n = 50).

Clinical healing period, length of hospital stay, operative time, postoperative complications including recurrence, wound dehiscence, and surgical site infection, as noted during postoperative follow-up period; Visual Analog Scale scores for pain.

RESULTS: The mean follow-up period was 12 months. No significant differences were observed between the 2 groups in length of hospital stay ($P = .515$), operative time ($P = .175$), wound dehiscence ($P = .645$), and Visual Analog Scale pain scores ($P = .112$). The mean operative times were 42.5 minutes in the modified Limberg group and 40.0 minutes in the lateral advancement group.

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CONCLUSIONS: Although lateral advancement flap transposition with Burow's triangle is used less often than modified Limberg flap transposition, we could not determine a parameter that was statistically different such as operative time, postoperative complication, or the length of hospital stay. Hence, the lateral advancement flap is as viable an option as other more preferable techniques in the treatment of PSD, which particularly settled on the upper segment without a deep natal cleft.

Pilonidal sinus disease (PSD) is a common and acquired entity in young adults. It is seen more common in men than in women, and has an estimated incidence of 26/100,000 in the general population.[1] PSD begins when hair follicles penetrate into one or more sinus walls, mostly in the sacrococcygeal region (although this can occur in several other anatomical locations), followed by the development of a chronic infection, either acute or subacute.[1,2] The main principles in the surgical treatment of PSD are to minimize the amount of postoperative pain and wound care needed, to minimize the recurrence rate, and to enable the patient to return to daily life as soon as possible. To date, many options for surgical treatment of the disease have been developed and described, but there is yet no consensus about treatment, as all the surgical methods produce various recurrence rates. Unfortunately, in spite of the superiority of the flap transposition techniques over the nonflap techniques, morbidity and recurrence rates have not been completely ruled out.[2,3] Asymmetric closure techniques are being used in the management of sacrococcygeal PSD, including the modified Limberg flap transposition technique and the lateral advancement flap transposition with Burow's triangle technique. The aim of both techniques is to achieve an off-midline closure of the surgical wound after excision of the diseased natal cleft. Several studies have reported that lateralization of the natal cleft is important in preventing midline recurrence.[4]

To date, no randomized study has appeared in the literature comparing these specific techniques. The aim of this study was to compare the short-term results of modified Limberg flap transposition, a widely used technique in PSD surgical treatment, with lateral advancement flap transposition with Burow's triangle, a relatively less frequently used technique, in terms of Visual Analog Scale (VAS) pain scores, recurrence, postoperative complications, and surgical site infections (SSIs) in the first 12 months postoperatively.

Methods

Study design

This study was planned as a prospective randomized clinical trial. The study subjects were 100 consecutive patients with PSD admitted to Ankara Mevki Military Hospital General Surgery Service between May 2013 and August 2013. The study protocol was approved by the Gulhane Military Medical Academy Local Ethics Council (number 001642), and was registered at ClinicalTrials.gov (NCT number 02116738). All patients in the study received detailed preoperative information about the study, and confirmed their willingness to participate with the written consent form.

Patients were randomly assigned to undergo surgery with either modified Limberg flap transposition or lateral advancement flap transposition with Burow's triangle. Patient information was recorded in the computer, and the patients were randomly divided into 2 groups. Ten patients were excluded from the study. Exclusion criteria included the following: age below 15 years, collagen tissue disease, recurrent generalized PSD, and infection or abscess in relation to PSD. A rhomboid excision and the modified Limberg flap transposition technique was performed in Group 1 (n = 50). A rectangular sinus excision and the lateral advancement flap transposition with Burow's triangle technique was performed in Group 2 (n = 50). All patients underwent surgery in the General Surgery Department of Ankara Mevki Military Hospital by the same surgical team.

Surgical technique

Preoperative preparation included bathing the night before surgery. Shaving and administration of a single intravenous dose of a broad-spectrum antibiotic as prophylaxis were performed on the day of surgery. Spinal anesthesia was administered, and the patients were placed in the prone position. The surgical area was disinfected with a 10% povidone–iodine solution.

In Group 1, a rhomboid excision and modified Limberg flap boundaries were marked with a marker pen. A rhomboid excision containing the pilonidal sinus tissue was performed, including its ramifications, along with surrounding tissue through the presacral fascia. The cephalic apex remained on the midline and the caudal apex was placed 2 cm lateral to the inferior midline, as required by the modified version.[5] Then, a fasciocutaneous transposition flap was tailored on the gluteal region contralateral to the asymmetric lower apex of the defect, fully mobilized on its inferior edge, and transposed medially to fill the rhomboid defect without tension. Silicone drainage tubes were placed under negative pressure in all of the patients. The subcutaneous tissue was approximated with a layer of interrupted Vicryl 2/0 sutures, and the skin was closed with a skin stapler.

In Group 2, a rectangular-shaped excision and lateral advancement flap with Burow's triangle boundaries were marked with a marker pen. A rectangular excision containing the diseased tissue was performed, including all sinuses