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Kite excision in complicated pilonidal sinuses: A retrospective cohort study of a tissue-sparing technique

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Ethics Committee Approval
The study was approved by the Haydarpaşa Numune Training and Research Hospital Education Planning Commission (EPC) (August 25, 2023 - 223052508). Written consent was obtained from the patients to use images of their likenesses.
All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

Conflict of Interest
No conflict of interest was declared by the authors.

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Abstract

Background/Aim: Pilonidal sinus (PS) is a benign chronic condition that primarily affects young people and can have a significant impact on their social life and work. Treatment options range from minimally invasive methods to surgical interventions involving wide excision. This study evaluates the outcomes of Kite excision, which aims to preserve healthy tissues, in cases of complicated PS extending along the natal cleft line.

Methods: This retrospective cohort study included cases of complicated PS extending along the intergluteal sulcus. Patients with minimally extended PS, sinus openings extending laterally, or patients in whom the defect area was closed using other methods (e.g., rotation flap or Limberg flap) were excluded. Patient data were obtained from medical records and the hospital information system: patient age, gender, body mass index (BMI), length of hospital stay, duration of drainage, follow-up period, presence of flap necrosis or flap edema, wound dehiscence, and presence of seroma, hematoma, or surgical-site infections.

Results: A total of 41 patients were included in the study; five (12%) were female. Twenty-three patients (56%) had recurrent PS; 18 patients (44%) underwent surgery for the first time. The mean age of the cohort was 28.5 years (standard deviation: 5.1 years). The mean BMI of the group was 30.2 kg/m^2 (standard deviation: 2.9 kg/m^2), and the mean hospital stay was 1.3 days (standard deviation: 0.6 days). Wound dehiscence was observed in two patients (4.9%), and hematoma beneath the flap was observed in one patient (2.4%). Seroma was detected in one patient (2.4%). A surgical-site infection was identified in two patients (4.9%). The overall postoperative complication rate was 14.6%, and recurrence was observed in one patient (2.4%).

Conclusion: Kite excision performed along the natal cleft line in cases of complicated PS is a safe, effective, and minimally invasive procedure that preserves healthy tissues. It is a recommended surgical treatment option in cases of complicated PS with vertical extension, and it will reduce the incidence of recurrence and increase patient comfort.

Keywords: pilonidal sinus, complication, natal cleft, recurrence, surgery

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Introduction

Pilonidal sinus (PS) is a condition that primarily affects young adults and is characterized by intergluteal discharge. Pilonidal sinus can significantly impact people's social lives and overall comfort; severe cases may require individuals to take time off from work. Minimally invasive methods have been used to treatment the disease [1,2]. However, the prevalence of PS, its recurrence rate, and changes in skin quality in the intergluteal region due to procedures can pose challenges. Undesirable outcomes such as skin deformities, scar tissue expansion due to tissue tension, and further thinning of the skin can occur after PS surgeries in the intergluteal region [3]. The positive effects of minimizing tissue tension during PS surgery are frequently emphasized in the literature [3-5]. In cases of recurrent PS and in patients with widespread disease in the intergluteal area, it is crucial to plan surgical interventions that minimize tissue tension. High tissue tension can lead to the development of complications in the surgical area. Flap techniques, which involve closing the tissue defect that occurs after excision without tension, are used to treatment PS. Flap techniques vary depending on the surgeon's experience and the extent of the disease [4].

Kite incision has proven efficacy in complicated cases in the intergluteal region [6,7]. In this study, the results of surgery using the Kite incision technique in recurrent and complicated PS cases extending along the intergluteal line were evaluated.

Materials and methods

We considered cases of recurrent and widespread PS in the intergluteal region that were treated between March 2018 and December 2022. Care was taken to include all cases of vertically extending recurrence or complicated PS in which the Kite incision method was used. The study protocol was approved by the Haydarpaşa Numune Training and Research Hospital Education Planning Commission (EPC) (August 25, 2023 - 223052508). Written consent was obtained from the patients to use their likenesses. The age, gender, body mass index (BMI), length of hospital stay, duration of drain removal, follow-up period, incidence of flap necrosis or flap edema, wound dehiscence, and the presence of seroma, hematoma, or surgical-site infections were evaluated. Two patients received general anesthesia due to previous lumbar disc herniation surgery; another patients received spinal anesthesia. All patients received a prophylactic dose of 1 gram of cefazolin sodium prior to surgery. Methylene blue was injected into the sinus tracts of all patients to make the sinus tracts more visible. Kite excision was planned and performed (Figures 1, 2). The Kite incision model, developed by the author based on many years of PS surgery experience, has become a routine surgical practice in cases of complicated or recurrent PS with vertical extension [6,7]. When the procedure involves descending below the coccyx, the electrocautery power is reduced to minimize thermal damage. Care is also taken to leave a full-thickness layer of tissue under the flap, with the muscle fibers of the gluteus maximus visible. The lower lateral part of the flap is also released and mobilized to reduce tissue tension and create a well-vascularized flap (Figures 3, 4). In all of the patients in this study, 2/0 polyglactin and 2/0 polypropylene sutures were used to close the defect (Figure 5). The surgical specimen resembles the shape of a kite (Figure 6).

Figure 1: Recurrent PS and Kite excision line drawing along the natal cleft line.

Figure 2: Appearance of retracted specimen after Kite excision in a case of recurrent PS with good traction.

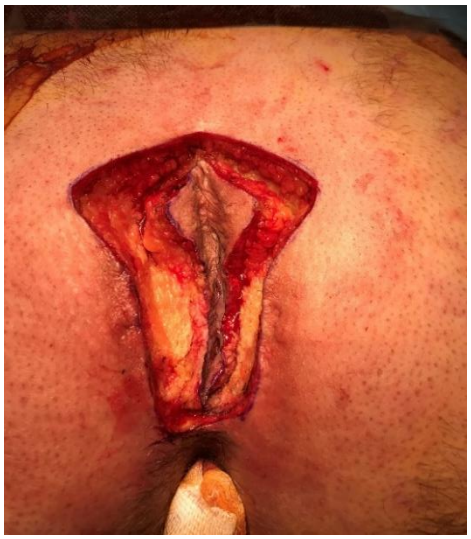

Figure 3: Defect area formed after excision.

Figure 4: The flap in which the inferolateral of the pedicle is released by separating over the gluteus maximus muscle to close the defect area.

Figure 5: Covering the defect area with 2/0 polypropylene.

Figure 6: View of the surgical specimen. The view of a recurrent case of methylene blue extending from the superior sinus mouth to the inferior sinus mouth.

Statistical analysis

We used the Statistical Package for the Social Sciences (SPSS; version 22; IBM SPSS, Istanbul, Turkey) for the statistical analyses. We adopted descriptive statistics, including means and standard deviations for numerical variables and numbers and percentage values for categorical variables. The Pearson correlation coefficient was used to test relations between numerical variables.

Results

Twenty-three (56%) of the patients had recurrent PS, and 18 (44%) were undergoing surgery for the first time. Five patients (12.2%) were female and 36 (87.8%) were male. The data of the patients are presented in table 1. No flap necrosis or flap edema was observed in any of the patients. Wound dehiscence was observed in two patients (4.9%); hematoma was observed under the flap in one patient (2.4%). Seroma was detected in one patient (2.4%). Surgical-site infections occurred in two patients (4.9%). The overall postoperative complication rate was 14.6%. One patient had a combination of wound dehiscence, hematoma, and a surgical-site infection. This patient presented on the 8th postoperative day with complaints of bleeding and swelling at the surgical site, without any history of trauma. Antibiotic therapy was administered to treat the infection. One patient (2.4%) experienced recurrence five months after surgery (Figure 7). Excision was performed on this patient, and the defect area was closed (Figure 8).

Table 1: Patients' demographics results

	Mean (Standard deviation)
Age	30.2 (2.9) year
BMI	30.2 (2.9) kg/m^2
Hospital stay	1.3 (0.6) day
Follow-up	23.7 (9.2) month
Duration of drain removal	2.7 (0.7) day

BMI: body mass index

Figure 7: Recurrence in the patient who had excision of the Kite.

Figure 8: Postoperative view of recurrence. Primary repair after excision.

Discussion

While PS surgery is considered to be relatively straightforward, it requires care and good planning in cases of recurrence and when a large area is affected. Excessive removal of healthy tissues may cause difficulties in closing the defect in cases requiring wide excision. Attention to tissues is even more important in wide excisions. The flap method used with the patients in this study aims to preserve healthy tissues to the maximum extent possible.

Complicated PS is frequently seen in the natal cleft line. Furthermore, the remaining natal cleft after PS surgery can result in PS recurrence [8,9]. In cases where the natal cleft is deep and the disease extends towards the anus, there may be concerns about damaging the anal sphincters. However, the complete excision of the sinus tracts identified with methylene blue will reduce the risk of recurrence and the possibility of repeated surgical interventions [6,7]. Such complete excision is particularly important in cases of complicated PS disease. After an excision, the defect area in the sacral region, where tension is high, is often enlarged while the excision material appears contracted [6]. We suggest determining the size of the flap to be taken from the gluteal region—where the flap will be used to close the defect—in order to minimize volume loss. Closing the defect with a flap method reduces tissue tension, which allows patients to move more comfortably during the healing period [10,11]. The flap should be selected to close the defect smoothly, without tension, and with a well-vascularized pedicle. Such a choice, together with Kite incision, yields a tension-free closure in the subcutaneous tissue with 2/0 polyglactin sutures. n this study, the good blood supply of the flap emphasizes that the flap pedicles provide good vascularization. Furthermore, we believe that surgical-site infections were the causes of the two cases of wound dehiscence. However, wound dehiscence due to thermal damage caused by electrocautery has also be observed in cases in which the skin is not completely incised with a scalpel and the skin incision is made with electrocautery [12].

In the Kite excision, tension-free repair is achieved by removing less tissue than one would take away in cases that extend along the vertical axis. It is emphasized in the literature that flap repairs provide better results than primary repairs [13,14]. It is believed that fixing the base of the flap to the posterior fascial tissue of the sacrum increases postoperative pain. In this study, the base of the flap was not fixed to the postsacral fascia, which has been linked to increased patient comfort.

Excision of the midline and lateral displacement of the suture line can be effectively achieved with Kite excision. The displacement of the midline is important in the surgical treatment of PS and also one of the primary goals in the surgical treatment models of Baskom and Karydakis [8,9]. The total complication rate in our study was 14.6%, which is lower than the rate reported in the literature [15-17].

Limitations

There are limitations to this study. It is retrospective, the sample size was relatively small, and we did not make a direct comparison with a similar technique.

Conclusion

Treatment of PS can be challenging when a case is complicated. However, safe and effective treatment is more likely be achieved in centers where complicated cases are frequently treated. The Kite incision model, developed as a result of experience, is the right option for many patients.

Natal cleft excision with the Kite excision method and closure of the resulting defect with a safe and easy flap method is a procedure with low complication rates. This method allows for better cosmetic results with minimal tissue excision in complicated PS cases that extend vertically. The Kite incision model can contribute to effective treatment and patient satisfaction with only one surgical procedure in complicated PS cases. The success of PS surgery is possible with low wound tension and effective excision of the sinus tracts. The Kite incision model stands out as a superior treatment model that yields wide excision and low wound tension.

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