



Comparison of limberg flap and primary suture technique in surgical treatment of sacrococcygeal pilonidal sinus

Sakrokoksigeal pilonidal sinüs cerrahi tedavisinde limberg flep ile primer kapama tekniğinin karşılaştırılması

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Abstract

Objective: In this study, we aim to present the results of two different surgical techniques in sacrococcygeal pilonidal sinus that we operated on.

Materials and Methods: 123 patients who underwent Limberg flap or primary suture for pilonidal sinus by a single surgeon were evaluated prospectively at Bitlis State Hospital between October 2011 and September 2014. Patients were divided into two groups: in group 1 (n=65), rhomboid excision of tissue was applied and wound was closed with Limberg flap. In group 2 (n=58), after excision, wound was primarily closed. All patients were evaluated for postoperative complication and recurrence.

Results: 109 (88.6%) of patients were male and 14 (11.4%) were female, the proportion of male to female patients was 7.8/1. The most common postoperative complications were seroma (n=10) and infection (n=9) in the both groups. Significant difference was detected in both groups for complications (p=0.012). Patients were followed up 14.7±4.4 months in group 1 and 14.6±4.3 months in group 2. Recurrence rate was more common in group 2 (n=8) when compared to group 1 (n=1). A statistically significant difference was determined in both groups for recurrence (p=0.009). There was no differences between groups as far as postoperative pain and time to return work is concerned.

Conclusion: Recurrence was noticed more commonly in the patients with primary repair compared to Limberg flap repair in this study. No significant difference in terms of postoperative pain and time to return to work being found. We arrived to the conclusion that Limberg flap is a good technique for the repair of pilonidal sinus disease due to less recurrence rate and infection rate.

Keywords: Pilonidal Sinus; Limberg Flap; Complication.

Öz

Amaç: Bu çalışmada, iki farklı cerrahi tedavi tekniği uygulanan pilonidal sinüslü olguların takip sonuçlarının sunulması amaçlandı.

Gereç ve Yöntemler: Bitlis Devlet Hastanesi'nde Ekim 2011 ve Eylül 2014 tarihleri arasında pilonidal sinüs nedeniyle tek cerrah tarafından rhomboid eksizyon + Limberg flep veya eksizyon + primer kapama tekniği uygulanan 123 hasta prospektif olarak değerlendirildi. Grup 1 (n=65) Limberg flep uygulanan olgular, Grup 2 (n=58) ise Primer kapama uygulanan olgulardan oluşmaktaydı. Olgular postoperatif komplikasyon ve nüks açısından değerlendirildi.

Bulgular: Hastalarımızın 109'u (%88.6) erkek, 14'ü (%11.4) kadın olup, erkek/kadın oranı 7.8/1 idi. Postoperatif komplikasyon olarak en sık seroma (n=10) ve enfeksiyon (n=9) ile karşılaşıldı. Komplikasyonlar incelendiğinde gruplar arasında anlamlı fark saptandı (p=0.012). Grup 1'de 14.7±4.4 ay, Grup 2'de ise 14.6±4.3 ay olgular nüks yönünden takip edildi. Grup 1'de 1 olguda, Grup 2'de ise 8 olguda nüks tespit edildi. Her iki grupta hastalık nüksü açısından önemli istatistiki fark mevcuttu (p=0.009). Gruplar arasında postoperatif ağrı ve işe dönüş süresi açısından anlamlı fark saptanmadı.

Sonuç: Bu çalışmada primer kapama tekniği ile daha fazla enfeksiyon ve nüks oranı saptandı. Postoperatif ağrı ve işe dönüş açısından fark saptanmadı. Son yıllarda giderek popülerite kazanan Limberg flep tekniğinin, gerek düşük enfeksiyon oranı, gerekse kabul edilebilir nüks oranı ile pilonidal sinüs tedavisinde etkin kullanılabileceğine inanıyoruz.

Anahtar Kelimeler: Pilonidal Sinüs; Limberg Flep; Komplikasyon.

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INTRODUCTION

Pilonidal sinus (PS) is a condition that usually involves sacrococcygeal region. It typically develops as a lesion that serves as a source of chronic discharge and abscess formation; there may also exist a painful sinus tract (1). Although there are many conservative and surgical methods used for its treatment, recurrence rates remain high and research efforts to develop novel treatment methods are ongoing. Procedures to be performed to manage the remaining cavity after sinus excision are controversial. Excision and primary closure, marsupialization and various flap techniques have been developed for surgical management of pilonidal sinus (2). This study aimed to assess the outcomes of PS operations performed by a single surgeon using Limberg flap and primary suture techniques in a single center.

MATERIALS and METHODS

This study prospectively analyzed the data of 123 patients who underwent Limberg flap or primary suture for PS at Bitlis State Hospital between October 2011 and September 2014. Group 1 (n=65) consisted of patients closed with Limberg flap while Group 2 (n=58) patients underwent primary suture technique. Patient data were recorded starting with the first case. The operation type was randomly selected. In PSs that are infected or contained abscess, operation was postponed until appropriate drainage and antibiotics were completed. Age, gender, time of symptom onset, and presence of previous abscess were recorded. Weight and height of patients were also recorded to calculate body mass index, which was categorized as the following: below 20: underweight; 20-25.9: normal weight; 26-29.9: overweight; above 30: obese (excess-weight).

Skin cleansing was done the night before the operation. All patients were administered prophylactic Cefazolin 1 gr I.V. After spinal or local anesthesia application, all patients were placed in prone jackknife position. The operative field was prepared and both gluteal regions were stretched with adhesive tapes to expose the operative field. The operative field was scrubbed for at least three times with gauzes soaked in polyvinyl iodine solution. A gauze soaked in polyvinyl iodine solution was also placed on anal region to reduce the risk of any contamination from that region. The whole surgical field down to presacral fascia was excised to include all sinus tracts. The wound site was irrigated with isotonic saline. Drains of varying thicknesses depending on wound size were placed intraoperatively in all patients. Subcutaneous tissue was sutured with a 1/0 vicryl suture and skin with 2/0 polypropylene mattress suture. All patients were administered a 7-day course of postoperative antibiotherapy consisting of an oral quinolone and ornidazole, both at a dose of 1 gr/day. All patients were discharged on the same day of operation. The patients were seen again to care for their wounds and administer Visual Pain Scale (VPS) on first and second days after the operation. At subsequent follow-up appointments, the patients were evaluated in terms of infection, seroma, and recurrences. Drains were

removed once their output fell below 10cc. Sutures were removed on 10-12th day after surgery in patients without any incision or flap problems. Return to active work was recorded for all patients. All patients were called for follow-up at postoperative 3rd, 6th, and 12th months to check for recurrences. All patients were also examined for recurrences in March 2015. The date of the last examination was recorded as the end of follow-up in patients that could not be reached. SPSS (Statistical Package for the Social Sciences Inc., Chicago, IL, USA) 12.0 for Windows was used for data analysis. Quantitative data were expressed as mean-standard deviation. Data were analyzed using Chi-square and Student t tests. A p value of less than 0.05 was considered statistically significant.

RESULTS

The study included 109 men and 14 women, making a total of 123 patients. The operative techniques depending on patients' gender were shown on Table 1. The mean duration of patients' symptoms was 15.92 (1-68) months, with no significant difference being found between the two groups (p=0.08). Thirty-two patients in Group 1 and 22 in Group 2, totaling 54 patients, had a history of curettage+drainage due to abscess; no significant difference was noted between the two groups with regard to history of abscess formation (p=0.207). Twenty-two cases were recurrent, of which 17 were in Group 1 and 5 in Group 2. Four patients had two previous surgeries due to PS. Mean body mass index was 24.65±3.1; its distribution across the groups was shown on Table 1.

Table 1. Distribution of the operative techniques and body mass index among groups

Gender	Group 1 n (%) (Limberg Flap)	Group 2 n (%) (Primary Suture)	Total (n)
Male	54 (83)	55 (95)	
Female	11 (17)	3 (5)	109
Total	65 (100)	58 (100)	14
			123
Body mass index			Total
Normal weight	24 (37)	23 (39.7)	47
Overweight	38 (58.4)	29 (50)	67
Obese	3 (4.6)	6 (10.3)	9
Total	65 (100)	58 (100)	123

Both groups were predominantly composed of overweight patients. The groups did not significantly differ with respect to body mass index (p=0.339). Postoperative complications were predominantly seroma (n=10) and infection (n=9). Three patients were re-opened completely or partially due to severe infection while the other patients were successfully treated by daily dressings and antibiotherapy. No flap necrosis was seen in Group 1. None of the patients suffered postoperative bleeding. The groups were significantly different with respect to postoperative complications

($p=0.012$). Complications were shown on Table 2. There was not any significant difference between VPS on first and second days (for VPS on the first day, $p=0.827$; for VPS on the second day, $p=0.054$). The mean duration of return to work was 10.3 ± 1.8 days for Group 1 and 11.5 ± 1.7 days for Group 2. No significant difference was found between the two groups ($p=0.369$). Patients in Group 1 were followed for 14.7 ± 4.4 months and patients in Group 2 for 14.6 ± 4.3 months for recurrences ($p> 0.05$). Recurrence was detected in 1 patient in Group 1 and 8 patients in Group 2. The mean time to recurrence was 9.44 ± 3.3 months. There existed a significant difference between disease recurrences of both groups ($p=0.009$).

Table 2. The postoperative analyses of the patients among groups

Postoperative complications (n)	Group 1 (Limberg Flap)	Group 2 (Primary Suture)	p value
Seroma	4	6	$p=0.001$
Infection	1	8	2
Open wound	1	2	
Time to return work (day)	10.3 ± 1.8	11.5 ± 1.7	$p=0.369$
Length of follow-up (month)	14.7 ± 4.4	14.6 ± 4.3	$p=0.849$
Recurrence (%)	1.5	13.8	$p=0.009$

DISCUSSIONS

Pilonidal sinus is a condition that seems to be simple to treat at first glance but is an important disease due to its high frequency of postoperative complications, increased recurrence rate, and lack of a treatment option on which a consensus has been reached. It typically affects males in their second or third decade and may cause a significant workforce loss (3). It was also common in men than women in our study, with a male-to-female ratio of 7.8/1.

Fairly variable treatment options have been used for PS. The treatment goal is to select an ideal treatment technique that is associated with lowest complication rate, shortest hospital stay, and lowest long-term recurrence rate possible. Excision is the primary surgical treatment. Primary closure, marsupialization and flap (Limberg, Karydakis, Rhomboid, V-Y flap, Z-plasty) sliding techniques are the most commonly used techniques, each with own advantages and disadvantages. Limberg flap technique that was used for Group 1 in the present study has recently gained popularity and is associated with acceptable complication, recurrence rates (4,5).

The rate of infection varies between 14% and 25% for primary closure. In addition, it has been reported that incision was switched to open and healing was achieved in this way due to infection in 10% of cases who undergo primary suture after excision (6). Gilani et al. (7) reported that surgical field infection was more frequent in primary suture technique while wound healing was quicker. In this study, the infection rate was found 13.8% in patients

who were applied primary closure. Furthermore, the wounds had to be left to open healing owing to infection in 2 cases in Group 2.

The recurrence rate varies between 5% and 22% in primary closure (8). According to most authors, the exact reason of recurrence is scar tissue being left in the intergluteal cleft at midline (9). Hence, 10 times less infection and recurrence rates have been reported with incisions carried out of intergluteal cleft compared to primary closure (4). Some studies have reported recurrence rates of 11% to 42% with primary closure; however, wound dehiscence following primary suture can be left to secondary healing (10). Our recurrence rate was 13.8% in Group 2, a rate that was comparable with literature data. Literature data suggest that follow-up duration is one of the most important factors affecting recurrence rates. Recurrences most commonly occur in the first year (11). In the present study, the cases were monitored for recurrences for 12 months on average. Recurrence rates, however, may change by increasing follow-up period.

Karydakis (12) indicated that the main factor causing recurrences is ingrown hairs, advocating that recurrences are avoidable by caring personal hygiene and preventing hair ingrowth. According to Sondenaa (6), chronic inflammatory process is responsible for recurrences; wound infection delays wound healing and causes recurrences. Marks et al. (13) detected anaerobic bacterial proliferation in wounds following operation. Bacterial proliferation in wound at midline reportedly delays bacterial proliferation as hair ingrowth occurs again into wound. Especially leaving a dead space in the cleft is believed to create an anaerobic medium where bacteria proliferate and recurrence develops.

Limberg flap technique has gained popularity as an increasingly used technique for PS treatment. It is striking that it is associated with low recurrence rates in many studies conducted so far. Daphan et al. (14) reported an infection rate of 4.1%, seroma rate of 2%, recurrence rate of 4.8%; Topgöl et al. (15) reported the respective rates of 1.5%, 1.5%, and 2.5%. In our study, the rate of infection, seroma, and recurrence in Group 1 was 1.5%, 6.1%, and 1.5%, respectively.

We also found greater rates of recurrence and infection in patients treated with primary suture compared to flap closure. Flap necrosis was not encountered. We think that this may have resulted from the fact that the flap pedicle was not kept short while turning flap. Although some studies have reported lower hospitalization rates with Limberg flap technique, a reliable assessment could not be done due to the fact that the patients were monitored at hospital on a daily basis and the operations were primarily carried out with local anesthesia (14).

This study could not detect any significant difference between the groups in terms of postoperative pain assessed by postoperative VPS (Visual Pain Scale), and there are not enough literature data about this subject. Although in Limberg flap technique incision is larger and intact tissue is used as a flap, pain was not different from

patients with primary suture technique. Return to work has been reported 12.8 to 18.8 days on average, and our study also found a similar figure (11).

CONCLUSIONS

Pilonidal sinus is regarded as an important condition since it is primarily a disease of a young population. Our study demonstrated higher rates of infection and recurrence with primary suture technique. We believe that Limberg flap technique, which has gained increasing popularity in recent years, can be effectively used in the treatment of pilonidal sinus thanks to both its lower infection rate and acceptable recurrence rate.

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