Is Marsupialization Effective in Fistula Surgery?

Marsupiyalizasyon Fistül Cerrahisinde Etkili midir?

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ABSTRACT

Objective: The present study aims to demonstrate the surgical and patient-reported outcomes of marsupialization after fistulotomy in intersphincteric and low transsphincteric fistulas.
Methods: A consecutive number of 100 patients who were diagnosed with an intersphincteric (IS) or a low transsphincteric (LTS) fistula and underwent fistulotomy with or without marsupialization were included in this study. The study cohort was divided into two groups: fistulotomy with and without marsupialization.
Results: The study population consisted of 77 male patients with a mean age of 37.59±10.83 years. The number of patients with IS fistulas was 56 (56%). The marsupialization was performed in 36 patients, 26 of them with LTS fistula. The mean VAS score was significantly lower in the marsupialization group than the no-marsupialization group (p=0.035). Moreover, the duration of wound healing was demonstrated significantly shorter in the marsupialization group than non-marsupialization group (p=0.039).
Conclusion: Marsupialization is an effective and feasible technique for fistulotomy wounds in patients with simple fistulas in terms of reducing postoperative pain and duration of wound healing.

Keywords: Fistulotomy; marsupialization; intersphincteric fistula; low transphincteric fistula; anal fistula; wound healing

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ÖZET

Amaç: Mevcut çalışma intersfinkterik ve aşağı trassfinkterik fistüllerde marsupiyalizasyonun cerrahi ve hasta-raporlu sonuçlarını göstermeyi amaçlamıştır.
Yöntem: İntersfinkterik (İS) fistül veya aşağı transsfinkterik (ATS) fistül tanısı alan ve fistülotomi ile beraber marsupiyalizasyon uygulanan veya uygulanmayan ardışık 100 hasta çalışmaya dahil edilmiştir. Çalışma kohortu iki gruba ayrılmıştır; marsupiyalizasyonlu ve marsupiyalizasyonsuz fistülotomi.
Bulgular: Çalışma populasyonu 77 erkek hastadan oluşmakta olup, ortalama yaş 37.59±10.83'dür. İS fistüllü hasta sayısı 56 (%56)'dır. Marsupiyalizasyon 36 hastada uygulanmış olup bunların 26'sı ATS fistüllü hastalardır. Ortalama VAS skoru marsupiyalizasyon uygulanan grupta marsupiyalizasyon uygulanmayan gruba göre anlamı derecede düşüktür (p=0.035). Ayrıca yara iyileşme süresi marsupiyalizasyon uygulanan grupta marsupiyalizasyon uygulanmayan gruba göre anlamlı derecede kısadır (p=0.039).
Sonuç: Marsupiyalizasyon, basit fistüllü hastalarda postoperatif ağrının ve yara iyileşme süresinin azalmasında fistülotomi yarası için etkili ve uygulanabilir bir tekniktir.

Anahtar Sözcükler: Fistülotomi, marsupiyalizasyon, intersfinkterik fistül, aşağı transsfinkterik fistül, anal fistül, yara iyileşmesi

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INTRODUCTION

Anal fistula is one of the most common anorectal diseases encountered by general and colorectal surgeons (1). It is frequently a result of cryptoglandular infection and rarely may arise from an underlying pathology such as Crohn's disease, tuberculosis, and malignancy (2). Anal fistula is classified based on the extension and relation of the tract with the internal and external sphincter muscles: intersphincteric, transsphincteric, extrasphincteric, and suprasphincteric fistulas (3). Surgical treatment techniques vary from simple fistulotomy to seton insertion and endorectal advancement flap, ligation of the intersphincteric fistula tract (LIFT), video-assisted fistula treatment (VAAFT), laser ablation of fistula (LAFT), anal fistula plug, injection of autologous stem cells, over-the-scope clip (OTSC), and fistula excision with direct sphincter reconstruction depending on the type of the fistula (4-6).

Intersphincteric fistulas can optimally be treated with lay open fistulotomy or fistulectomy as recommended by many guidelines (7,8). In comparison, the low transsphincteric fistula can be treated with fistulotomy or a seton placement depending on the amount of involved sphincteric muscles and the surgeon's experience. To improve postoperative pain, fasten the wound healing, and decrease the time to return to work after fistulotomy or fistulectomy, several techniques were investigated including, topical sucralfate and phenytoin, silicate-based wound dressing application, and marsupialization (9-13). Among these, marsupialization has been thoroughly investigated in terms of surgical and patient-reported outcomes and is found to be associated with quicker wound healing, reduced days of daily dressing, and pain (14-16).

The present study aims to demonstrate the efficacy and feasibility of marsupialization and surgical outcomes related to this technique after fistulotomy in intersphincteric and low transsphincteric fistulas.

METHODS

Study design and setting

This study was designed as a comparative retrospective review of prospectively collected data and conducted in a single institution. The study was approved by the ethical committee of Memorial Ankara Hospital (no:30.11.2021/4), and reported according to the STROBE guidelines for observational studies. A consecutive number of patients operated for anal fistulas between 2019 and 2021 were reviewed for the eligibility criteria and included in the study. The study cohort was divided into two groups: fistulotomy with and without marsupialization.

Eligibility criteria

Patients who were diagnosed with an intersphincteric (IS) or a low transsphincteric (LTS) fistula on Magnetic Resonance Imaging (MRI) and underwent fistulotomy with or without marsupialization were included in this study. Patients with a known underlying disease such as Crohn's disease and malignancy were excluded from the study.

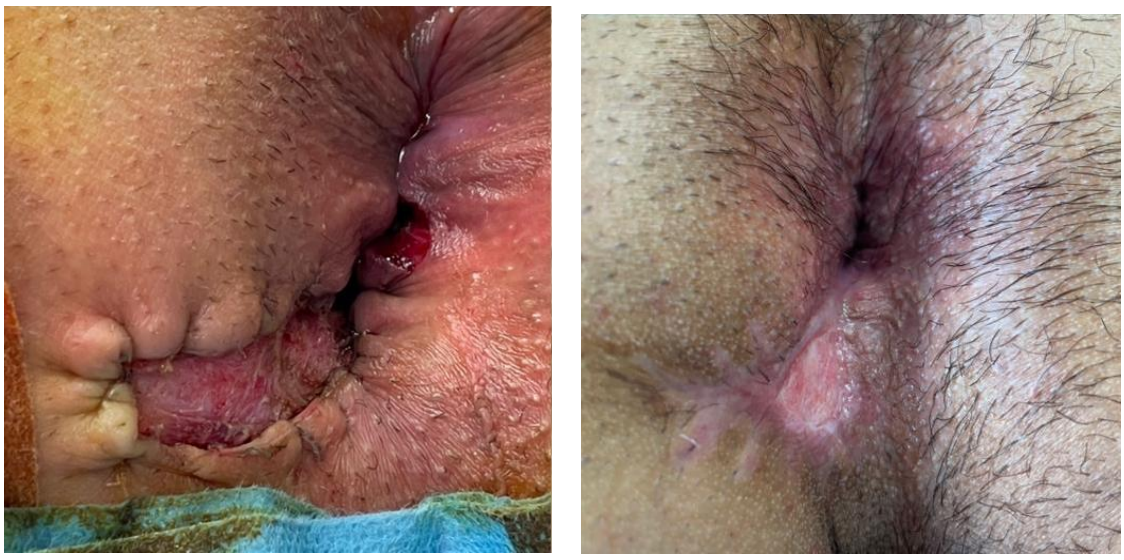
Patients who were diagnosed with high transsphincteric, extrasphincteric, and suprasphincteric fistulas on MRI were excluded from the study. Patients with a recurrent anal fistula or known underlying diseases such as malignancy, tuberculosis, or Crohn's disease were also not included.

Operative technique

Patients with an IS fistula are all treated with a standardized fistulotomy technique, whereas patients with LTS fistulas are treated with partial fistulotomy and hybrid seton placement.

All operations are performed under spinal anesthesia, and the patient is placed in a jack-knife position. Prophylactic antibiotics are given intravenously, preferably one dose of metronidazole. The external orifice of the fistula tract is visualized, then the anoscope is placed to create an exposure to the anal canal. 0.3–1.0 mL of 10% hydrogen peroxide (H2O2) was injected to enable us to find the internal orifice with a vascular catheter from the external orifice. A guide is inserted into the fistula tract, and depending on the type of the fistula, either complete fistulotomy or partial fistulotomy with hybrid seton placement is performed. Following fistulotomy, the cavity floor is curetted and cleaned from the debris and remains of the tract. As a next step, the cavity edges are inverted using 4-0 absorbable sutures in a continuous manner in the marsupialization group (Figure 1 and 2).

Figure 1: A patient with an intersphincteric fistula located in the left anterolateral.



2a 2b

Figure 2: 2a) A marsupialized fistulotomy wound on postoperative day 1 and **2b)** On postoperative 14th day

Postoperative care

The patient usually requires one dose of analgesic drug administration, and the second dose of metronidazole is repeated. The patient is discharged on postoperative day-1 with recommendations including daily sitz-baths and change of the wound dressing. The patient is followed up regularly on postoperative day-5, postoperative 1st month, and 3rd month.

Primary and secondary endpoints

The primary endpoint of the study is to demonstrate differences in surgical outcomes between the two study groups, including operative time, intraoperative bleeding, postoperative pain, length of hospital stay, duration of wound healing, and recurrence. The pain during postoperative 24 hours was measured using a visual analogue scale (VAS) scored between 0 and 10. The duration of wound healing was characterized as the presence of epithelialized tissue and was evaluated regularly on postoperative 1st week, 1st and 3rd months follow-up. Moreover, the patients were asked for the presence of wound discharge during the telephone interview.

The second endpoint of the study is to evaluate patient-reported outcomes (PROM) in patients who underwent fistulotomy with and without marsupialization. The PROM questionnaire consists of five variables regarding mobility, self-care, daily activities, pain/discomfort, and anxiety/depression (17). Each item in the variable is scored from 1 to 3, representing the severity of complaints from severe to mild.

Statistical analysis

The statistical software package SPSS 22.0 for Windows® (SPSS Inc., Chicago, IL) was used for statistical analysis. Continuous variables were reported as mean with standard deviation or number with a percentage. Shapiro-Wilk test was performed to evaluate the normal distribution of continuous variables. Continuous variables with normal distribution were analyzed using Student t-test, whereas Mann-Whitney-U test was performed for non-normal distributed variables. Categorical variables were analyzed using Chi-square test. A p-value of <0.05 was accepted as statistically significant.

RESULTS

A total of 134 consecutive patients met the eligibility criteria, 34 of them could not be reached by phone and were excluded from the study, and 100 patients were included in the final analysis.

The study population consisted of 77 male patients with a mean age of 37.59±10.83 years (Table 1). There were no statistically significant differences between the two study groups regarding patients' characteristics. Most fistulas were located posteriorly (n=49), followed by anterior (n=37) and lateral (n=14) locations. Detectable pathologies related to fistula were the chronic anal fissure in 48 patients (48%), the cryptoglandular abscess in 26 patients (26%), and the hemorrhoidal disease in 6 patients (6%). The number of patients with IS fistulas and LTS fistulas were 56 (56%) and 44 (44%), consecutively. The mean time for dropping of seton was found to be 8.56±7.02 days in patients with LTS fistulas; 7.73±4.38 days in the marsupialization group of LTS, and 9.77±9.69 days in the non-marsupialization group of LTS (p=0.348).

Table 1. A comparison of study groups in terms of demographic and surgical outcomes.

Variables	Study population (n=100)	Marsupialization (n=36)	No-Marsupialization(n=64)	p value
Age (Mean±SD)	37.59±10.83	38.76±11.17	35.50±10.01	0.149
Gender (M/F)	77/23	53/11	24/12	0.066
Smoking (%)	39 (39)	26 (66.7)	13 (33.3)	0.657
ASA (%)				
I	93 (93)	60 (64.5)	33 (35.5)	0.695
II	7 (7)	4 (57.1)	3 (42.9)	
III	-			
Fistula location (%)				
Anterior	37 (37)	20 (54.1)	17 (45.9)	0.251
Posterior	49 (49)	35 (71.4)	14 (28.6)	
Lateral	14 (14)	9 (64.3)	5 (35.7)	
IS fistula	56	10	46	-
LTS fistula	44	26	18	
Operative time (Mean±SD min)	34.55±13.67	45.56±11.63	28.36±10.50	**0.000***
Operative bleeding (Mean±SD ml)	6.38±1.71	6.25±1.63	6.61±1.85	0.315
VAS score (Mean±SD)	3.55±2.61	2.92±2.82	3.91±2.44	**0.035***
Length of hospital stay (Mean±SD days)	1.02±0.141	1.02±0.12	1.03±0.16	0.681
Duration of wound healing (Mean±SD days)	18.04±23.76	11.53±9.22	21.70±28.32	**0.039***
PROMs score (Mean±SD)	12.70±1.78	12.30±2.17	12.92±1.50	0.098
Recurrence	0	0	0	-
Mean Follow-up (Mean±SD months)	17.71±7.60	9.41±2.47	22.37±5.11	**0.000***

*p<0.05

Footnote: SD, standard deviation; ASA, American Society of Anesthesiology; IS, intersphincteric; LTS, low transsphincteric; min, minute; ml, milliliter; VAS, visual analogue scale; PROMs, patient-reported outcome measures.

The marsupialization was performed in 36 patients, 26 of them with LTS fistula. The mean VAS score was found to be significantly lower in the marsupialization group (p=0.035). Moreover, the duration of wound healing was demonstrated to be significantly shorter in the marsupialization group (p=0.039).

None of the patients had a recurrent disease during the follow-up. PROMs were applied to all patients, and each variable in the questionnaire was analyzed as numeric data in order to compare both groups (Table 2). The mean PROMs were analyzed as 12.70±1.78 in the study cohort, and no significant difference was observed between marsupialization groups.

Table 2: A comparison of study groups in terms of PROMs.

The five variables of the PROM questionnaire	Marsupialization (n=36) (%)	No-Marsupialization (n=64) (%)
Pain/discomfort		
I have a lot of pain/discomfort (1)	3 (8.3)	2 (3.1)
I have some discomfort (2)	20 (55.6)	32 (50)
I have no pain/discomfort (3)	13 (36.1)	30 (46.9)
Daily activities		
I have a lot of problems (1)	2 (5.6)	0
I have some problems (2)	15 (41.7)	16 (25)
I have no problems (3)	19 (52.8)	48 (75)
Mobility		
I have a lot of problems walking (1)	1 (2.8)	1 (1.6)
I have some problems walking (2)	10 (27.8)	14 (21.9)
I have no problems walking (3)	25 (69.4)	49 (76.6)
Self-care		
I have a lot of problems (1)	1 (2.8)	0
I have some problems (2)	4 (11.1)	12 (18.8)
I have no problems (3)	31 (86.1)	52 (81.2)
Anxiety/depression		
I am very worried (1)	12 (33.3)	8 (12.5)
I am a bit worried (2)	11 (30.6)	37 (57.8)
I am not worried (3)	13 (36.1)	19 (29.7)

PROMs variables were also evaluated after the stratification of study groups according to the fistula type. The mean of PROMs variables, including pain, daily activities, mobility, self-care, and anxiety, were similar between IS and LTS fistulas (Table 3).

Table 3: PROMs variables are shown as stratified according to the fistula type in each study group.

Variables		Pain/ Discomfort (Mean±SD)	Daily activities (Mean±SD)	Mobility (Mean±SD)	Self-care (Mean±SD)	Anxiety/ depression (Mean±SD)
Marsupialization group (n=36)	**LTS**	2.308±0.5491	2.731±0.4523	2.654±.5616	2.769±0.4297	2.154±0.6748
	IS	2.526±0.5569	2.763±0.4309	2.816±0.3929	2.842±0.3695	2.184±0.6087
p-value		0.54	0.58	0.48	0.36	0.92
Non-Marsupialization group (n=64)	**LTS**	2.167±0.6183	2.389±0.6077	2.667±0.4851	2.833±0.3835	2.000±0.8402
	IS	2.389±0.6077	2.556±.6157	2.667±.5941	2.833±.5145	2.056±.8726
p-value		0.26	0.76	0.32	0.46	0.80

Footnote: SD, standard deviation; IS, intersphincteric; LTS, low transsphincteric.

DISCUSSION

The present study demonstrated that the marsupialization of fistulotomy wounds is an effective and feasible method in reducing postoperative pain and fastening wound healing.Fistulotomy has been widely accepted as the gold standard treatment of the intersphincteric fistula (18). However, inevitably, this procedure comes with the consequence of creating a raw unepithelialised wound that prolongs wound healing, requires daily dressings, and decreases the patient's quality of life (19). Marsupialization is a technique that decreases wound size and promotes wound healing by suturing the perianal skin to the edges of the laid-open fistulotomy wound (20). Depending on the surgeon's choice, this technique can be performed in a continuous or an interrupted manner, using polyglactin, vicryl or cat-gut sutures (13-16, 21,22).

The postoperative pain at 24-hours measured by VAS score was found to be lower in the marsupialization group of our study. Whereas, in two randomized-controlled trials, no significant differences were observed in mean VAS scores between marsupialization and non-marsupialization groups (13,14). These studies had relatively small cohorts, consisting of only 20-24 patients for each study arm. Another randomized-controlled trial conducted by Chalya et al. included 162 patients and demonstrated that mean VAS scores were similar in postoperative 24-hours, 1st, 3rd and following weeks (21). However, all these trials included both fistulotomy and fistulectomy patients, which might have caused statistically insignificant results.

In the present study, the duration of wound healing was found to be significantly shorter in the marsupialization group. The duration of wound healing is a complex variable to measure; most of the studies take into account the time of complete wound healing, and some of them measure the time of epithelialized tissue, thus resulting in high-level heterogeneity. Nonetheless, whether the measurement is the time of complete wound healing as in weeks (14,15,21,22), or is the visualization of epithelialized tissue as in days, marsupialization has been proven to be inducing wound healing.

The mean operative time was longer, and the mean follow-up was shorter in the marsupialization group, and these findings can be attributed to the application of a new technique to our clinical practice.

Although the duration of wound healing and VAS scores are significantly different, PROMs were found to be similar in both groups. Anan et al. obtained similar results regarding the effect of the procedure on the lifestyle: social, physical, and sexual activity (15). Moreover, a recent meta-analysis including six studies revealed that marsupialization is associated with a significantly shorter healing time but similar postoperative pain scores, incontinence, and recurrence rates (19).

The major limitation of our study was its retrospective and non-randomized nature, which may have resulted in an unintentional bias during the patient selection for the application of the planned method.

Nonetheless, marsupialization is a technique proven to be significantly easy and effective, and it should be applied to the routine clinical practice of fistulotomy in patients with intersphincteric and low transsphincteric fistulas.

Conflict of interest

No conflict of interest was declared by the authors.

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