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Comparison of Incision and Drainage Procedure with Drainage and Ligation of the Intersphincteric Fistula Tract in the Treatment of Deep Perianal Abscess

Introduction

Perianal abscess is an acute purulent infection of the soft tissues surrounding the anorectum, with a male-to-female ratio of 9:1. The highest incidence is observed in individuals aged 30–50 years [1,2]. While 90% of cases originate from cryptoglandular glands, differential diagnoses include infectious conditions such as hidradenitis suppurativa, herpes simplex, human immunodeficiency virus, tuberculosis, syphilis, and actinomycosis, as well as malignancy and radiation dermatitis [3].

The etiology of perianal abscesses involves stasis and infection resulting from obstruction of the ducts of cryptoglandular glands. This infection may progress to form a transsphincteric (ischiorectal) abscess by spreading through the intersphincteric plane or laterally into the ischiorectal space [4]. Symptoms of ischiorectal abscess include swelling, pain, redness, and increased temperature in the perianal region. Due to its deep location, however, it can sometimes be overlooked, leading to complications such as necrotizing fasciitis and sepsis [5].

Deep perianal abscess (DPA) and fistula often co-occur. An anal fistula is an abnormal connection between the anal canal or rectum and the perianal skin, with an incidence of 5.5 per 100,000 women and 12.1 per 100,000 men. It is most commonly observed in individuals aged 39 years and is associated with risk factors such as smoking, diabetes, and high body mass index (BMI) [6,7]. According to the Parks classification, perianal fistulas are categorized as low fistulas (subcutaneous, intersphincteric, and low transsphincteric) or high fistulas (high transsphincteric, suprasphincteric, and extrasphincteric) [8].

The primary goal of acute perianal abscess drainage is to evacuate the abscess effectively while preserving anorectal function and preventing recurrence. Incision and drainage are the most common initial treatments, but recurrence rates for DPA with transsphincteric fistulas are as high as 73% following this procedure [9]. Approximately 40% of patients present with a fistula after recurrence, resulting in increased morbidity, healthcare costs, and a negative impact on quality of life [10].

In cases of DPA with complex anal fistulas, traditional procedures such as fistulotomy or fistulectomy are not viable due to the risk of incontinence [11]. The ligation of the intersphincteric fistula tract (LIFT) procedure, first introduced by Rojanasakul et al., is a sphincter-preserving technique with reported healing rates ranging from 60% to 94% [12]. This method reduces the risk of incontinence by preventing sphincter injury and converting complex fistulas into simpler ones, thereby achieving secondary success [13].

Despite its advantages, there is limited data on the effectiveness of the LIFT procedure in patients with deep perianal abscesses and transsphincteric fistulas. This study aims to evaluate the efficacy of LIFT combined with incision and drainage in reducing abscess recurrence, incontinence, and fistula healing rates.

Patients and Methods

This retrospective cohort study included 111 patients who underwent surgery for DPA in the proctology department of a tertiary hospital between March 2020 and April 2024. Of the 130 patients who presented to the emergency department, 19 were excluded from the study for various reasons (3 patients with major incontinence, 2 patients with Crohn's disease, 8 patients over the age of 65 with severe chronic illnesses, 1 patient with immune deficiency, 2 patients with necrotizing fasciitis/sepsis, and 3 patients with missing data). For the remaining patients, information on age, gender, body mass index, history of smoking, presence of comorbidities, history of previous attacks, history of antibiotic use, onset of symptoms, infection parameters at admission (White blood cell [WBC] and C reactive protein [CRP] tests), preoperative Wexner (Cleveland Clinic Florida Fecal Incontinence Severity Scoring System) incontinence scores, and anal Magnetic Resonance Imaging (MRI) reports were obtained from medical records and the hospital database.

Patients were informed that if no fistula was detected on anal MRI imaging or if the internal fistula opening could not be identified, they would only be included in the incision and drainage group. Simple drainage was planned for 56 patients, and drainage with the LIFT procedure was planned for 55 patients. However, in the LIFT group, the internal fistula opening could not be identified in only 1 patient. That patient was included in the first group, and incision-drainage (Group 1) was performed on 57 patients, while incision-drainage combined with the LIFT procedure (Group 2) was performed on 54 patients. Postoperative outcomes were recorded (Fig. 1).

Study Inclusion and Exclusion Criteria

Inclusion Criteria:

- Patients referred to the proctology department due to ischiorectal abscess.
- Patients with mid-high transsphincteric fistulas identified by anal MRI.
- Patients aged 18–65 years.

Exclusion Criteria:

- Superficial perianal abscesses.
- Complex supra- and extrasphincteric abscesses.
- Perianal abscesses secondary to Crohn's disease.
- Use of immunosuppressive medications.
- Necrotizing fasciitis or clinical signs of sepsis.
- Patients with major incontinence.
- Patients with missing data.

Data Collection

Patient demographics, clinical characteristics, and surgical outcomes were recorded. Variables included age, gender, Body mass index-BMI, smoking history, comorbidities, history of previous abscess episodes, antibiotic use, duration of symptoms, WBC and CRP levels, preoperative Wexner incontinence scores, and anal MRI findings. Postoperative outcomes such as pain scores, complications, and fistula healing were also documented.

Preoperative Preparation

All patients underwent preoperative evaluations, including contrast-enhanced anal MRI to determine the location of the internal opening and the size of the abscess. Spinal anesthesia was administered, and patients were positioned in the lithotomy position. The perianal and perineal skin was disinfected with Betadine, and the anal canal and lower rectum were irrigated with Betadine.

Surgical Techniques

Group I- Incision and Drainage:

A T-shaped incision was made at the most prominent area of fluctuation to drain the abscess. A sample was collected for bacterial culture. All septa within the abscess cavity were separated, and the cavity was irrigated with hydrogen peroxide and isotonic solution. Rifampicin-impregnated gauze was placed in the cavity to prevent premature closure.

Group II- Incision, Drainage, and LIFT Procedure:

The abscess was drained in a T-shaped manner from the most prominent fluctuation area, and a sample was taken for bacterial culture during this process (Fig. 2A). All septa within the abscess cavity were separated (Fig. 2B) and irrigated with hydrogen peroxide. During this procedure, the external opening of the fistula was identified, and the presumed origin was determined according to Goodsall's rule. By following the fistulous tract in these patients, the origin point at the intersphincteric plane could be identified in almost all cases (Fig. 2C). The inflamed area at the internal opening of the fistula was excised and sutured with 3/0 polyglactin (Fig. 2D). Subsequently, the fistula tract was identified via a mini-incision in the intersphincteric region, and the tract was pulled back with a stylet, tied, and ligated with 3/0 polyglactin (Fig. 2E). This opening was then closed using 4/0 absorbable sutures. Finally, rifampicin-impregnated gauze was placed in the cavity to prevent premature closure and the procedure was completed. (Fig. 2F).

Postoperative Care

All patients received oral antibiotics (500 mg ciprofloxacin and 500 mg metronidazole) for up to one week. Intramuscular analgesics were administered on the first postoperative day, followed by oral analgesics. Sitz baths were initiated on the first postoperative day and continued three times daily until wound healing.

Follow-Up

Patients were evaluated on postoperative day 14 and at 3rd and 6th months. Assessments included wound healing, McGill-Melzack pain scores, Wexner incontinence scores, and anal

MRI findings. Study endpoints included: Permanent fistula (persistence beyond 3 months), recurrent abscess, development of new fistulas and complete healing (epithelialization).

Statistical Analysis

All analyses were performed using SPSS software (version 22.0; IBM Corp., Armonk, NY). Continuous variables were expressed as means ± standard deviations and compared using independent t-tests or ANOVA. Categorical variables were presented as frequencies and percentages and analyzed using chi-squared or exact tests. Logistic regression and log-rank analyses were used to identify predictors of fistula recurrence and compare clinical outcomes between groups. The variables representing the lowest risk for each complication were considered as the reference group (OR = 1). Odds ratios (OR) and 95% confidence intervals (95% CI) were calculated for the risk of persistent fistula. A p-value <0.05 was considered statistically significant.

Ethical approval

The study was conducted in full compliance with the principles of the Helsinki Declaration. Ethical approval for the study protocol was obtained from the Clinical Research Ethics Committee of Alanya Alaaddin Keykubat University Faculty of Medicine (10354421/11-23), and written informed consent was obtained from all participants prior to the operation.

Results

Demographic Characteristics and Preoperative Findings

Group I included 47 men and 10 women, with a mean age of 46.40 ± 11.14 years. Group II included 45 men and 9 women, with a mean age of 44.52 ± 12.10 years. There was no statistically significant difference between the groups (P> 0.05). The mean BMI was 27.19 kg/m² in Group I and 28.54 kg/m² in Group II, with no significant difference between the groups (P= .563). In Group I, 49.13% of patients were smokers, compared to 55.60% in Group II. Diabetes mellitus was present in 19.30% of Group I and 18.50% of Group II, with no significant differences between the groups. Five patients (8.77%) in Group I and six patients (11.1%) in Group II had experienced at least one previous abscess episode. The average duration of symptoms was 4 days in both groups. Anal MRI revealed that 35.1% of patients in Group I had high transsphincteric fistulas, while 55.6% of patients in Group II had high transsphincteric fistulas. Mid-transsphincteric fistulas were present in 24.6% of Group I and 44.4% of Group II (Table 1).

Intraoperative and Postoperative Findings

The mean operation time was significantly longer in Group II (43.85 ± 5.85 minutes) compared to Group I (31.61 ± 7.59 minutes) (P= .000). Complications were observed in 19.3% of Group I and 27.8% of Group II patients, but this difference was not statistically significant (P> 0.05).

Group I: Resistant wound infections (5 patients), surgical site edema (3 patients), bleeding (2 patients), and urinary retention (1 patient).

Group II: Resistant wound infections (3 patients), acute fissures (3 patients), surgical site edema (4 patients), and bleeding (3 patients).

The mean length of hospital stay was significantly longer in Group II (8.20 ± 3.14 days) compared to Group I (5.09 ± 2.31 days) (P= .000). Recovery time was also significantly longer in Group II (47.74 ± 7.66 days) compared to Group I (38.40 ± 10.29 days) (P= .000). On the first postoperative day, patients in Group II reported higher pain scores (18.19 ± 5.82) compared to Group I (15.11 ± 5.65) (P= 0.006). By day 14, pain scores were slightly higher in Group II but not statistically significant (P> 0.05). At 3 months, the mean Wexner incontinence score was 3.61 ± 2.70 in Group II and 2.89 ± 2.04 in Group I, with no significant difference (P> 0.05). At 6 months, the scores were 4.56 ± 3.81 in Group II and 3.73 ± 2.72 in Group I, again showing no significant difference (P> 0.05). At 3 months, 28.1% of Group I patients had persistent fistulas, compared to 5.7% of Group II patients (P= .001). At 6 months, persistent fistulas were observed in 38.2% of Group I patients and only 3.7% of Group II patients (P= .000). Recurrent abscesses occurred in 12.72% of Group I patients and 1.88% of Group II patients, but this difference was not statistically significant (P> 0.05) (Table 2).

One patient in Group II developed an intersphincteric fistula following recurrence, which required fistulectomy and drainage. Minor incontinence was observed in this patient, but complete clinical recovery was achieved. In Group I, complex fistulas were detected in recurrent cases. Five patients underwent advanced treatment with LIFT, while two patients refused further interventions and underwent only drainage.

Clinical Efficacy

Logistic regression analysis identified the following significant predictors of fistula recurrence: Higher pain scores on postoperative day 14 significantly increased the likelihood of fistula development (B = 0.479, OR = 1.614, P= .039). The addition of LIFT significantly reduced the likelihood of fistula recurrence compared to drainage alone (B = −8.043, OR = 0.000, P= .030) (Table 3).

Log-rank analysis showed that the median fistula-free period was 16 months for Group I, while the median value for Group II was not reached. The average fistula-free period was 13.616 months for Group I and 15.738 months for Group II (P= .000) (Table 4, Fig. 3).

Discussion

Obliteration of the internal opening in anal fistula is key to successful treatment. Overzealous attempts to locate the fistula tract in fragile tissue can lead to the creation of a false passage and unnecessary division of the sphincter muscle, potentially resulting in changes in continence [14,15]. The rate of identifying the internal opening during surgery for acute anal abscess in the literature varies between 10% and 88% [16]. In the study by Rojanasakul et al., the internal opening was successfully identified in 90% of cases. However, in the group where the internal opening or intersphincteric pathology could not be identified, the healing rate dropped to 50% [17]. In our study, the fistula tract and internal opening could not be identified in only 1 out of 55 patients with DPA and fistula, achieving a 98.2% success rate in identifying the internal opening.

Recent studies have shown that the risk factors for recurrence of anal abscesses include Crohn's disease, diabetes mellitus, and ischiorectal location [18-20]. In a study by Yano and colleagues, it was found that patients with diabetes mellitus and ischiorectal abscesses were not at increased risk for recurrence of anal abscess. The researchers examined BMI and found that patients with morbid obesity were also not at increased risk for recurrence of anal abscess [21]. Various studies have identified obesity, smoking, diabetes mellitus, previous multiple surgeries, perianal collections, and the length of the fistula tract as predictive factors for surgical failure [22,23]. In their study, Salgado-Nesme et al. identified a history of diabetes and an operation duration of more than 69 minutes as predictive factors that increase the risk of fistula recurrence and the development of continence disorders [24]. In our study, diabetes (19.30%), increased BMI (28.54), and smoking (49.13%) were identified as the main risk factors for the development of perianal abscesses.

Unlike other studies, we included patients who had experienced attacks (11.1%) in our study. Various studies have determined that recurrent abscesses lead to more complex fistulas [25]. Swinscoe et al. evaluated studies conducted between 1966 and 2004 and determined that the most important factor in the healing of complex fistulas was the complexity of the fistula [26]. According to the guidelines published by the American Society of Colon and Rectal Surgeons, there is no standard procedure for controlling local sepsis in complex fistulas [27]. In the German S3 Guideline, the use of LIFT is weakly recommended as the primary treatment for new, high, transsphincteric anal fistulas [28].

Bleier et al. reported success in 35 out of 39 patients followed for 20 weeks, without subjective impairment of continence [29]. Yassin et al. collected data on 183 of 498 patients in terms of continence, identifying mild continence disorder in 6% of them [30]. In a prospective study by Perez et al. involving 16 patients with recurrent high transsphincteric, suprasphincteric, or extrasphincteric fistulas, it was found that incontinence scores improved postoperatively in all patients who had preoperative incontinence [31]. In our study, the 3rd and 6th-month Wexner incontinence scores were found to be similar in both groups, and no major incontinence was detected in any patient.

In the study by Hamadani et al., the frequency of fistula formation after simple incision and drainage of perianal abscess was reported as 16%, and the recurrence rate of abscess was 13% [32]. On the other hand, Zahra et al. reported a recurrence rate of 24% in their study applying the LIFT technique [33]. In our study, after an average follow-up period of 11 months, persistent fistula developed in 3 patients in the drainage + LIFT group (compared to 21 patients in the incision and drainage group), and recurrent abscess was detected in only 1 patient.

Pearce et al. conducted a multicenter observational study involving 141 patients and found a 2-3 fold increase in pain scores following packing [34]. Subsequently, a multicenter randomized controlled trial by Newton et al. demonstrated that packing neither prevented fistula formation nor abscess recurrence but increased postoperative pain [35]. In our study, logistic regression analysis found that the pain score on the 14th day was a significant predictor that independently increased the likelihood of avoiding persistent fistula development. It is thought that packing delays wound closure, causing both pain and preventing fistula development.

Sirany et al., in a study classifying seven LIFT variations across 26 studies, determined primary healing rates ranging from 47% to 95% [36]. These results are similar to the findings of a recent meta-analysis by Quah et al., which showed that primary treatment of the fistula tract reduces the risk of recurrence by 83% [37]. Similarly, in our study, the drainage + LIFT procedure was shown to reduce the risk of fistula recurrence in the Log rank analysis.

Limitations

This study has several limitations. As a single-center, retrospective study with a relatively small sample size, the findings may not be generalizable to all patient populations. Additionally, the follow-up period of 11–18 months may not capture long-term outcomes, such as late recurrence or delayed complications. Future prospective, randomized controlled trials with larger sample sizes are needed to validate these findings and establish standardized treatment protocols.

Strengths

Despite its limitations, this study has notable strengths. The use of MRI to confirm fistula healing and recurrence provides a reliable assessment of treatment outcomes. Additionally, the inclusion of patients with previous abscess episodes allows for a more comprehensive evaluation of the LIFT procedure's efficacy in complex cases. Finally, the use of Wexner incontinence scores ensures an objective assessment of anorectal function, highlighting the procedure's safety.

Conclusions

This study demonstrates that the LIFT procedure, when combined with incision and drainage, significantly reduces the risk of fistula recurrence and abscess formation in patients with deep perianal abscesses and transsphincteric fistulas. The procedure is safe, effective, and preserves continence, offering a superior alternative to incision and drainage alone. While the findings provide valuable insights, further research is necessary to confirm these results and establish the LIFT procedure as a standard treatment for complex anal fistulas.