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## Overlapping sphincteroplasty in anal incontinence: our clinical experience

Overlapping in anal incontinence

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### Abstract

**Aim:** Primary sphincter repair remains the first-choice surgical treatment for patients diagnosed with anal sphincter defect incontinence. This study aims to present the outcomes of patients who underwent overlapping sphincteroplasty for anal incontinence treatment at our clinic over the past five years.

**Methods:** In this study, we retrospectively examined the data of 23 patients who underwent surgical treatment for anal incontinence complaints and were subsequently followed up. Our parameters included age, comorbidities, muscle defect duration, muscle defect degree, surgery duration, wound dehiscence, need for stoma, current complaints, Kegel exercises, postoperative smoking, and Cleveland Clinic Fecal Incontinence Score (CCFIS) values before and after surgery.

**Results:** All patients were female, with a mean age of  $40.1 \pm 12.81$  years. The mean surgery duration was 80 minutes. The CCFIS means was 15.61 preoperatively and 7.65 postoperatively, with a mean CCFIS difference of  $7.95 \pm 6.87$ . The median muscle defect duration was 48 months (range 1-360 months). The etiology was incontinence due to obstetric anal sphincter trauma. Wound dehiscence occurred in 60.9% (n=14) of patients. Compliance with Kegel exercises was observed in 52.2% (n = 12) of patients. The need for stoma was found in 17.4% (n = 4) of all patients, and its clinical significance in remission was not significant. Postoperative complaints were statistically significantly less in patients who performed Kegel exercises after surgery ( $p < 0.05$ ).

**Conclusion:** Our study found that postoperative Kegel exercises led to improvements in symptoms. While there was a weak to moderate correlation between age, defect duration, and CCFIS, this relationship was not statistically significant. Therefore, postoperative Kegel exercises are recommended for symptom improvement.

### Keywords

anal incontinence, sphincteroplasty, kegel exercises, obstetric injury

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Introduction

Fecal incontinence, defined as the involuntary discharge of stool, is a condition that causes physical, social, and psychological disorders, significantly impairing the quality of life. This condition affects between 2% to 17% of the general population and nearly half of the elderly population in nursing homes. Fecal incontinence is multifactorial, with the most common causes being sphincter injuries or vaginal injuries, anorectal surgical procedures, and neuronal damage associated with neurological conditions.<sup>1,2</sup>

In recent years, numerous new methods for the treatment of anal incontinence have been introduced. These methods vary in effectiveness, and some are still in the clinical research stage. Despite this, primary sphincter repair continues to be the first-choice surgical treatment for patients diagnosed with an anal sphincter defect incontinence.<sup>1,3,4</sup> However, in the past few decades, although short-term high success rates have been reported for overlapping sphincteroplasty, long-term evaluations have revealed a gradual decrease in function. This has led to questioning whether this operation truly represents the gold standard. The method, while relatively inexpensive and straightforward, has sparked various debates. These include the optimal timing from injury to repair; the best way to perform the repair; the benefits of medical or surgical fecal diversion; whether pudendal neuropathy predicts the outcome; and finally, if the age of the patient at the time of repair affects the outcome, what should be the appropriate age range.<sup>5-7</sup> In our study, we aimed to retrospectively analyze cases undergoing late-stage overlapping sphincteroplasty for fecal incontinence at our clinic and present them in light of the literature.

Materials and Methods

After obtaining approval from the ethics committee, our study included patients who underwent overlapping sphincteroplasty for Obstetric Anal Sphincter Injury Incontinence (OASIS) at our clinic between the years 2017 and 2022. Male patients and those who had previously undergone surgery for anal incontinence were excluded from the study. A dataset was created using hospital records, postoperative follow-up forms, and telephone interviews with the patients. Analyses were conducted based on this dataset. The study included patient data on age, etiological cause, muscle defect duration, muscle defect degree, surgery duration, preoperative and postoperative Cleveland Clinic Incontinence Score (CCFIS), development of wound dehiscence, need for stoma, current complaints, Kegel exercise adherence, and postoperative smoking status.

Preoperative radiological evaluation in our clinic routinely involves the use of a 360° probe (BK Medical, Flexfocus 400, Denmark) for endoanal ultrasound. MRI (3 Tesla, Philips, Netherlands) was performed on patients suspected of complex injury or additional pathology. Follow-up data were obtained from hospital records and telephone conversations.

All procedures were performed in the lithotomy position under spinal anesthesia. We did not routinely use bowel preparation. A mechanical enema was applied on the morning of the procedure. Patients were catheterized prior to surgery. An arcuate incision was made between the anus and vagina, and the vaginal mucosal flap was elevated. The ends of the sphincter on both sides of the defect were identified, and dissection was continued until sufficient length for overlapping was achieved. The dissection was extended deep into the pelvic floor. The sphincter ends were sutured in an overlapping fashion using 3-0 delayed absorbable sutures, along

with scar tissue. In some cases, a diverting stoma was applied according to the surgeon's preference. All patients were advised to abstain from sexual activity for at least three months.

Throughout the duration of the study, all sphincteroplasty operations were attended by at least one senior colorectal surgeon with extensive experience in the surgical technique.

Ethical Approval

This study was approved by the Ethics Committee of Çukurova University (Date: 03.11.2023, Decision No: 138/29).

Statistical Analysis

Statistical analyses were conducted using the SPSS 25 software. The Kruskal-Wallis and Shapiro-Wilk tests were employed to assess the normal distribution of numerical data. Results for parameters following a normal distribution were presented as mean and standard deviation (SD), while results for parameters not following a normal distribution were presented as median and interquartile range (IQR). The chi-square test was used for the analysis of categorical variables. Regression analysis was applied to evaluate the relationship between pre-operative and post-operative incontinence scores and other parameters. In all analyses, a p-value of <0.05 was considered statistically significant.

Reporting Guidelines

The study was reported in accordance with STROBE guidelines.

Results

Our study included 23 female patients. The mean age was 40.1 years. Two patients had a history of birth trauma as the etiological cause. The median degree of muscle defect detected by endoanal ultrasound was 91 degrees (range 60-180 degrees). The median

Table 1. Demographic and clinical data

| Parameter                  | Mean ± SD or n(%)           |
|----------------------------|-----------------------------|
| Number of patients, N      | 23                          |
| Age, y                     | 40.1 ± 12.81 (Range: 19-61) |
| <b>Comorbidities</b>       |                             |
| Diabetes mellitus          | 5 (21.7%)                   |
| <b>Etiology</b>            |                             |
| Benign anorectal surgery   | 2 (8.6%)                    |
| Obstetric trauma           | 21 (91.4%)                  |
| Muscle defect degree       | 91 ± 37.9 (Range: 60-180)   |
| Median defect duration, mo | 48 (Range: 1-360)           |

Table 2. Perioperative period

| Parameter               | Mean ± SD or n(%)           |
|-------------------------|-----------------------------|
| Number of patients, N   | 23                          |
| Operation duration, min | 80.4 ± 30.8 (Range: 30-130) |
| Wound dehiscence        | 14 (60.9%)                  |
| Kegel exercises         | 12 (52.2%)                  |
| Stoma                   | 4 (17.4%)                   |
| Preoperative CCFIS      | 15.60 ± 3.63 (Range: 6-20)  |
| Postoperative CCFIS     | 7.65 ± 6.47 (Range: 0-20)   |

CCFIS: Cleveland clinic fecal incontinence score

Table 3. Current clinical status

| Kegel Exercises | Complaints |                  |                    |      | P value |
|-----------------|------------|------------------|--------------------|------|---------|
|                 | Pan        | Gas incontinence | Fecal incontinence | None |         |
| Yes             | 0          | 1                | 4                  | 7    | <0.05   |
| No              | 2          | 5                | 2                  | 2    |         |

duration of the defect was 48 months. Clinical data are presented in Table 1.

The mean duration of the operation was 80.4 minutes. Wound dehiscence developed in 14 patients, and 4 patients underwent stoma surgery. The change in the Cleveland Clinic Incontinence Score (CCFIS) was calculated to be a mean of  $7.95 \pm 6.87$ . Perioperative data are shown in Table 2.

It was observed that patients who performed post-operative Kegel exercises had fewer post-operative complaints ( $p < 0.05$ ). However, when comparing CCFIS results between patients who did and did not perform Kegel exercises, although there was a numerical decrease in scores in patients who performed exercises, the difference was not statistically significant (9.4 vs 6.3,  $p = 0.29$ ), as shown in Table 3.

A moderate negative correlation of  $-0.577$  was found between age at presentation and the difference in CCFIS score, and a moderate negative correlation of  $-0.561$  was found between muscle defect duration and the difference in CCFIS score. However, these variables did not have a statistically significant impact on the CCFIS score.

## Discussion

In this study, where we presented our results of overlapping sphincteroplasty in patients with anal incontinence due to sphincter damage, we found a wound dehiscence rate of 60%. We observed significant improvements in symptoms due to postoperative Kegel exercises. Although age and defect duration were weakly to moderately correlated with the Cleveland Clinic Fecal Incontinence Score (CCFIS), this relationship was not statistically significant.

Successful treatment of anal incontinence requires the identification of one or multiple causes leading to the disruption of continence and the correct application of medical, psychological, and surgical treatment options. A significant factor in treatment failure includes the inability to fully identify the problem, and it should be kept in mind that incontinence can develop through multiple mechanisms.<sup>7</sup>

When sphincter defects are identified in patients presenting with incontinence symptoms, surgery should be the first treatment method considered. The literature has previously presented that the success rates of overlapping sphincteroplasty decrease over long-term follow-up. It has been reported that sphincteroplasty provides short-term improvement in anal incontinence (68–74%), but later the success rate can drop to 0–50%. Pudendal nerve damage, variations in surgical technique, suture breakage, and muscle denervation with age are some of the known possible reasons for this long-term deterioration.<sup>8–12</sup> In our series, when evaluating the current clinical status of patients, 61% continued to have various complaints to varying degrees. We associated this with a high rate of wound dehiscence during the perioperative period and non-compliance with Kegel exercises. An important parameter affecting the success rates after sphincteroplasty is the presence of a large sphincter defect ( $>90^\circ$ ) and the emergence of postoperative wound infection. The benefit of protective colostomy to prevent wound contamination has been investigated, but no definitive conclusion has been reached.<sup>13,14</sup> Furthermore, it's crucial to remember that the morbidity associated with stoma formation and closure are significant issues. In our series, the mean muscle defect degree was 91 degrees, which was higher than that reported in the literature, and we believe this influenced our results. We did not find a relationship between the need for a stoma and wound dehiscence, but our study was not sufficiently robust to provide conclusive evidence on this matter.

Several studies in the literature have established a direct association between advanced age during sphincter repair and poorer clinical outcomes.<sup>5</sup> Bravo-Gutierrez et al. found that those with poor outcomes were older than those with successful repairs (49 vs. 43).<sup>15</sup> Similarly, the Cleveland Clinic group found a positive correlation between the Female Sexual Function Index scores and the age at surgery.<sup>16</sup> Differently, Hull T et al., using the Fecal Incontinence Quality of Life Scale in their study, suggested that age is not a determinant of the outcome for overlapping sphincter repair and that this procedure can be safely applied in both younger and older populations.<sup>4</sup> In our series, the mean age was relatively young, but 20% of the patients had chronic diseases like diabetes, which we believe affected the outcomes by impairing wound healing.

In the literature, the impact of the duration of incontinence symptoms prior to surgical repair on outcomes is a matter of debate. While there are studies claiming that patients who have experienced symptoms for over 10 years have higher Wexner Incontinence scores and poorer outcomes, there are also studies that have not found a significant relationship.<sup>17,18</sup> In our study, the median symptom duration was 48 months, a lengthy period, and we believe that these delays could affect the long-term outcomes.

The increase in squeezing pressure after sphincter repair is significant. The literature has reported that the contraction of the external anal sphincter and pelvic floor muscle exercises are associated with positive changes in fecal incontinence scores in women.<sup>19</sup> A study comparing sphincter repair alone with sphincter repair combined with biofeedback found no general difference in continence rates, but significant improvements in quality of life scores were observed with the repair and biofeedback combination.<sup>20</sup> The results of our study supported the improvement of symptoms in patients who performed postoperative Kegel exercises.

## Limitations

The limitations of our study include its retrospective nature and the limited number of patients. Due to the small sample size, the results were not compared in detail across etiological subgroups.

## Conclusion

In this study conducted with a limited number of patients, we believe that there could be multiple factors affecting the success of sphincteroplasty and its long-term efficacy. Postoperative Kegel exercises reduce postoperative symptoms and should be recommended for all patients. However, to determine the predictors of surgical success, there is a need for prospective, multicenter studies with larger patient populations

## Declarations

### Animal and Human Rights Statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

### Informed Consent

Written informed consent was waived due to the retrospective design of the study.

### Data Availability

The datasets used and/or analyzed during the current study are not publicly available due to patient privacy but are available from the corresponding author on reasonable request.

### Conflict of Interest

The authors declare that there is no conflict of interest.

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None.

**Abbreviations**

CCFIS: Cleveland clinic fecal incontinence score

IQR: Interquartile range

OASIS: Obstetric anal sphincter injury

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