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Comparison of the outcomes of overlapping and direct apposition sphincteroplasty techniques in anal sphincter repair

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ABSTRACT

Objective: Sphincteroplasty is of great importance in the repair of anal sphincter damage. In the present study, we compared the results of overlapping sphincteroplasty and direct apposition techniques used in anal sphincter repair.

Material and Methods: Between 2011 and 2021, 36 patients underwent sphincteroplasty for anal sphincter injury and were analysed retrospectively. Sex, age, etiologic factors, repair technique, degree of laceration, postoperative complications, length of hospital stay, time between injury and repair, follow-up time and postoperative Cleveland Clinic Incontinence Score (CCIS) were recorded for analysis, and the two techniques were compared statistically using SPSS statistics, Version 17.0.

Results: Of the sample, 31 were females and five were males, with a mean age of 31.50 ± 6.7 years. The etiologic factors were obstetric trauma in 25 patients, perianal interventions in seven patients and other traumas in four patients. The overlapping technique was applied to 14 patients and the direct apposition technique was applied to 22 patients. Mean postoperative CCIS of all cases was 5.53 ± 2.59, and was significantly lower in those who underwent overlapping sphincteroplasty technique than those who underwent apposition repair ($p= 0.006$). It was observed that postoperative CCIS decreased as the time between sphincter injury and repair decreased ($p< 0.001$; $r= 0.625$).

Conclusion: It is vital to repair anal sphincter damage as early as possible. The overlapping sphincteroplasty and direct apposition methods can both be considered safe for anal sphincter repair although in terms of faecal incontinence, the outcomes of overlapping sphincteroplasty are better than those of the direct apposition technique.

Keywords: Anal sphincter injury, direct apposition, fecal incontinence, overlapping sphincteroplasty

INTRODUCTION

Most anal sphincter injuries are obstetric and iatrogenic. Sphincter damage identified in postpartum ultrasonographic examinations occurs in 30% of women after first vaginal delivery (1). A study of sphincter damage via transanal ultrasonography following anorectal surgery has revealed 76% and 24% cases of internal and external anal sphincter damage, respectively (2). Perianal fistula surgeries are the most common cause of postoperative faecal incontinence, with the risk of incontinence following fistula surgery reported to be in the 10-20% range, increasing proportionally with the amount of the muscle cut (3). Anorectal traumas are other aetiological factors that usually result from sexual abuse, anal rape, falling on a sharp foreign body and vehicle accidents (4).

Faecal incontinence (FI) is the uncontrolled outflow of liquid or solid faecal matter from the anus, the extent of which depends on the degree of anal sphincter or nerve damage (5). It is a condition that can cause perineal pain and dyspareunia and a reduction in quality of life, which can lead to social withdrawal and postpartum depression and has very high treatment costs (6).

The available surgical approaches to anal sphincter repair include overlapping, direct apposition, post-anal repair, graciloplasty and total pelvic floor repair. Aside from the surgical methods available for the treatment of anal sphincter damage, medical treatments, stem cell treatments, artificial intestinal sphincters, elastomer implants, biofeedback method, rectal balloon, pelvic muscle exercises, digital rectal feedback method, transcutaneous posterior tibial nerve stimulation, sacral nerve

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stimulation, radiofrequency stimulation, etc. have also been described as treatment approaches. Despite the wealth of available information, a standard treatment algorithm for all patients is still lacking (5).

The present study compares the results of the overlapping and direct apposition techniques for the repair of anal sphincter damage resulting from anorectal trauma.

MATERIAL and METHODS

A retrospective analysis was made for 36 patients who underwent direct apposition or overlapping sphincteroplasty for the treatment of anal sphincter injury between January 2011 and June 2021. Ethics committee approval was obtained for the study (approval number: 2021/514/205/5), and the study was conducted following the ethical standards defined in the Declaration of Helsinki, as revised in 2013. In order to determine the sample power, power analysis was performed through the G*Power 3.1.9.4 program. When the margin of error α= 0.05 was accepted and it was assumed that the evaluations made would have a large effect size (d= 0.93), the power of the test was calculated as 0.83 (7). Included in the study were those over 18 years of age with obstetric traumas, perianal interventions and anal sphincter injuries secondary to trauma. Except for direct apposition and overlapping techniques, other sphincteroplasty cases (n= 3, graciloplasty) and patients under 18 years of age were excluded from the study. Patients who underwent sphincteroplasty for such reasons as congenital anomaly, advanced age, rectal prolapse and diabetes mellitus, as other aetiological causes of faecal incontinence, were also excluded from the study.

Age, sex, aetiological factor, degree of perineal laceration, surgical repair technique, presence of ostomy, time between sphincter injury and repair, postoperative complications, hospitalization period (days) and follow-up period (months) were obtained from the patients' epicrisis records and surgery reports. The Postoperative Cleveland Clinic Incontinence Score (CCIS) of the patients was ascertained via telephone or face-to-face interviews. The CCIS scoring system used to evaluate anal incontinence produces a score in the range of 0-20, and is based on such parameters as solid-liquid-gas incontinence, daily pad use and lifestyle change (8) (Table 1). Perineal lacerations are divided into four basic categories in the literature (Grade 1,2,3A-B-C and 4), (9,10).

In the overlapping sphincteroplasty technique, after the existing scar tissue is divided, the two free ends are superimposed and fixed with separate sutures to form a new sphincter complex (11). In the direct apposition technique, the end-to-end suturing of the muscle is carried out, one by one, with the sphincter ends facing each other (12). In the present study, following surgery, the postoperative CCIS, length of hospital stay and rate of postoperative complications of the groups that underwent overlapping and apposition repair surgeries were compared, and the relationship between the time between sphincter injury and sphincteroplasty and postoperative CCIS were analysed.

Statistical Analysis

The statistical analyses were performed using SPSS Statistics (Version 17.0. Chicago: SPSS Inc.). The conformity of the variables to normal distribution was evaluated with histogram graphs and Kolmogorov-Smirnov test. Mean, standard deviation and median values were used for descriptive analyses. Categorical variables were compared with Pearson Chi-square test, and a Mann-Whitney U test was used for the evaluation of non-normally distributed (nonparametric) variables in two groups. Spearman correlation test was used for the comparative analysis of the measurement data. A p-value of <0.05 was considered statistically significant.

RESULTS

Of the 36 patients included in the study, 31 were females and five were males, with a mean age of 31.5 ± 6.7 years. The aetiological factors were obstetric trauma in 25 patients, perianal surgical interventions in seven patients and trauma in four patients. There were four patients with perineal laceration Grade 3a, 10 patients with 3b, 11 patients with 3c, and 11 patients with 4. Repairs were made using the direct apposition technique in 22 patients and the overlapping technique in 14 patients. Mean time between sphincter injury and repair was 11.2 ± 18.1 days. A diversion colostomy was performed in a case with grade 4 perineal laceration resulting from trauma. A perianal fistula developed in two patients and wound infection in one patient as postoperative complications. Mean hospital stay was 2.00 ± 1.1 days; mean postoperative CCIS score of all cases was 5.5 ± 2.6; and mean follow-up period was 9.3 ± 5.2 months (Table 2).

Table 1. Cleveland clinic incontinence score (8)

Type of incontinence	Never	Rarely	Sometimes	Usually	Always
Solid	0	1	2	3	4
Liquid	0	1	2	3	4
Gas	0	1	2	3	4
Wears pad	0	1	2	3	4
Lifestyle alteration	0	1	2	3	4

Table 2. Demographic and clinical characteristics of the patients

	n/mean ± sd
Age	31.5 ± 6.7
Sex	
Male	5
Female	31
Etiology	
Obstetric trauma	25
Perianal surgery	7
Trauma	4
Perineal laceration grade	
3a	4
3b	10
3c	11
4	11
Surgical repair technique	
Overlapping	14
Direct apposition	22
Colostomy	1
Time between sphincter damage and repair (days)	11.2 ± 18.1
Postoperative complication	
Perianal fistula	2
Wound infection	1
Length of hospital stay (days)	2.00 ± 1.1
Postoperative CCIS score	5.5 ± 2.6
Follow-up time (months)	9.3 ± 5.2

CCIS: Cleveland clinic incontinence score.

There was no significant difference between the overlapping and apposition repair groups in terms of age, sex, aetiological factors, perineal laceration degree, postoperative complications, length of hospital stay, and follow-up (p> 0.05), (Table 3). In contrast, the postoperative CCIS mean of the overlapping group was significantly lower than that of the apposition repair group (p= 0.006).

The relationship between sphincter injury-sphincteroplasty interval and postoperative CCIS was evaluated with Spearman correlation test, revealing that postoperative CCIS increased as the time between sphincter injury and repair increased (p< 0.001; r= 0.625), (Figure 1).

DISCUSSION

There can be many causes of anal and perineum trauma, including sexual trauma, pelvic trauma and iatrogenic injuries, with the potential to lead to sphincter damage. In women, vaginal delivery is the most common cause of perineal trauma (13). Labour and vaginal deliveries can lead to the rupture of the perineal striated muscles and damage the pelvic nerves.

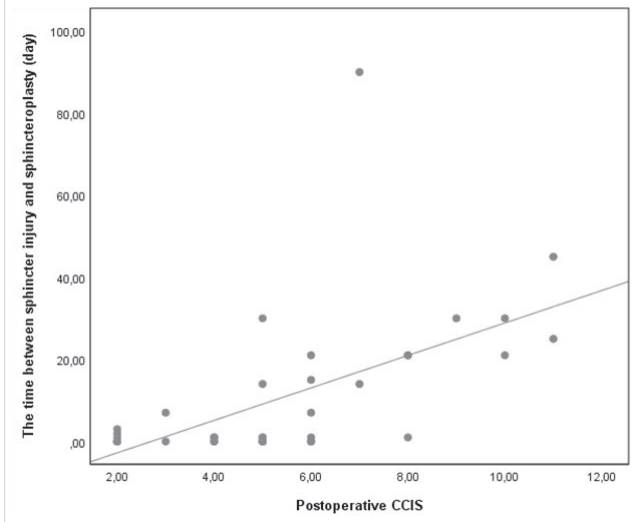

Figure 1. Correlation of time between sphincter injury and sphincteroplasty with postoperative CCIS.

Obstetric anal sphincter injuries (OASIS) are referred to also as third-and fourth-degree spontaneous perineal tears (14). The incidence of OASIS has been reported to be between 0.5% and 17% in the literature (15-20). Primiparous women (5.7%) are at greater risk than multiparous women (1.5%) with no previous OASIS (21). Prolonged second labour stage (>1 hour), advanced maternal age, high birth weight (>4 kg), instrumental vaginal delivery, nulliparity, shoulder dystocia, permanent occiput posterior position, Asian ethnicity, labour induction, epidural analgesia, and midline episiotomy have all been identified as independent risk factors for OASIS (22,23). The incidence of mediolateral episiotomy during vaginal deliveries has been reported to be 45-68%,and has been associated with third-or fourth-degree lacerations in approximately 25% of women (24). In the present study, obstetric trauma was the most common aetiological factor (69%) in anal sphincter injury.

Imaging methods such as anal manometry, magnetic resonance imaging, endoanal ultrasound, electromyography and defecography can be used for the evaluation of sphincter damage secondary to trauma, among which endoanal ultrasound is currently considered the optimum approach to the management of anal incontinence (25).

Sphincter repair aims to restore the anal canal to dimensions of at least 3 cm long and 2 cm thick (6). Lacerations involving the internal anal sphincter (Grade 3c, 4) must be identified and properly repaired to prevent the development of faecal incontinence. The two most common approaches to the repair of damaged external anal sphincter (EAS) are the direct apposition and overlapping techniques. Since the overlap of grade 3a and 3b partial thickness EAS tears will impose excessive stress on the repair, the direct apposition approach should be applied

Table 3. Comparison of the overlapping and direct apposition repair groups

	Overlapping	Direct Apposition	p
	n/mean ± sd	n/mean ± sd	
Age	29.8 ± 5.5	32.6 ± 7.2	0.490[2]
Sex		4	
Male	1	18	0.350
Female	13		
Etiology		13	
Obstetric trauma	12	6	0.225
Perianal surgery	1	3	
Trauma	1		
Perineal laceration grade			
3a	2	2	
3b	2	8	0.550
3c	5	6	
4	5	6	
Postoperative complication			
Perianal fistula	1	1	0.689
Wound infection	0	1	
Length of hospital stay (days)	2.00 ± 1.1	2.00 ± 1.1	0.962[2]
Postoperative CCIS score	4.1 ± 1.9	6.4 ± 2.6	**0.006[2]***
Follow-up time (months)	7.9 ± 3.3	10.3 ± 5.9	0.296[2]

[1]Chi-square test [2]Mann-Whitney U test.

CCIS: Cleveland Clinic Incontinence Score.

in such cases. In this technique, the free ends of the damaged EAS are approximated and sutured. The overlapping technique can be used only for full-thickness lacerations, as two free ends of anal sphincter muscle are required for a tension-free overlapping repair. The torn ends of the EAS are brought together, and 1-1.5 cm of the muscle ends are overlapped and sutured (15). In a meta-analysis, no significant difference has been found between the direct apposition and overlapping repair techniques in terms of flatus incontinence, dyspareunia and perineal pain, although those undergoing overlapping surgery have been shown to have lower faecal urgency and anal incontinence scores than those treated with the direct apposition technique (26). A randomized study comparing the two techniques has revealed the overlapping technique to be associated with worse functional outcomes (7).

For the best results in the treatment of sphincter injury, the repair procedure should be performed as early as possible-immediately after the damage occurs, if possible, but within 24 hours at the latest-and in a centre experienced in anal reconstruction surgeries (4). If sphincter damage is diagnosed after vaginal delivery, surgical repair is recommended within the first 12 hours (27).

Secondary surgical repair refers to surgery performed several months or years after anal sphincter injury. Sphincter repairs should be considered only after failed primary reconstructive surgery when other treatment modalities have been ineffective or there is an identifiable factor responsible for the failure. Sacral nerve modulation (SNM) is a minimally invasive, effective and sustainable treatment option for the treatment of faecal incontinence that improves impaired sphincter function through the continuous, electrical stimulation of the sacral nerves (28). Regardless of the aetiology of faecal incontinence, studies have shown SNM to be effective in the improvement of the continence mechanism (5). In patients with faecal incontinence with low quality of life, faecal referral involving the creation of a colostomy is a treatment alternative in cases where other treatments fail or cannot be applied (29).

Consistent with the literature, obstetric trauma (69.4%) was found to be the main aetiological factor in the patients in our study group. The postoperative quality of life and incontinence scores were higher in the group that underwent overlapping sphincteroplasty than in the group that underwent direct apposition surgery. There have been few studies to date investigating the effect of timing on CCIS. In the present study, a correlation analysis of the time between sphincter injury and surgery with CCIS revealed that early sphincteroplasty resulted in a better quality of life. The limitations of our study are its retrospective design, the fact that the postoperative results were not

supported by such diagnostic methods as endoanal ultrasound and anal manometry.

CONCLUSION

The early repair of anal sphincter injuries is vital. Both the overlapping and direct apposition sphincteroplasty techniques can be considered reliable for anal sphincter repair, although in terms of faecal incontinence, the outcomes of overlapping sphincteroplasty are better than those of the direct apposition technique. Further studies are needed to develop algorithms to steer the repair of sphincter damage secondary to trauma.

Ethics Committee Approval: This study was approved by Kartal Dr. Lutfi Kırdar City Hospital Clinical Research Ethics Committee (Decision number: 2021/514/205/5 Date: 27/10/2021).

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REFERENCES

1. *Warshaw J. Obstetric anal sphincter injury: Incidence, risk factors and repair. Sem Colon Rectal Surg 2001; 12: 90-7.*
2. *Stamatiadis A, Konstantinou E, Theodosopoulou E, Mamoura K. Frequency of operative trauma to anal sphincters: Evaluation with endoanal ultrasound. Gastroenterol Nurs 2002; 25: 55-9. https://doi.org/10.1097/00001610-200203000-00005*
3. *Bulut T. Fekal inkontinans. In: Menteş B, Bulut T, Alabaz Ö, Leventoğlu S, eds. Anorektumun Selim Hastalıkları. Türk Kolon ve Rektum Cerrahisi Derneği, Ankara, 2011: 187-214.*
4. *Kolodziejzak M, Sudol-Szopinska I. Anal sphincter injuries in daily surgical practice-diagnosis and treatment. Pelviperineology 2014; 33: 17-21.*
5. *Simillis C, Lal N, Pellino G, Baird D, Nikolaou S, Kontovounisios C, et al. A systematic review and network meta-analysis comparing treatments for faecal incontinence. Int J Surg 2019; 66: 37-47. https://doi.org/10.1016/j.ijsu.2019.04.007*
6. *DeLancey JO, Toglia MR, Perucchini D. Internal and external anal sphincter anatomy as it relates to midline obstetric lacerations. Obstet Gynecol 1997; 90: 924-7. https://doi.org/10.1016/S0029-7844(97)00472-9*
7. *Farrell SA, Flowerdew G, Gilmour D, Turnbull GK, Schmidt MH, Baskett TF, et al. Overlapping compared with end-to-end repair of complete third-degree or fourth-degree obstetric tears: Three-year follow-up of a randomized controlled trial. Obstet Gynecol 2012; 120: 803-8. https://doi.org/10.1097/AOG.0b013e31826ac4bb*
8. *Jorge JMN, Wexner SD. Etiology and management of fecal incontinence. Dis Colon Rectum 1993; 36: 77-97. https://doi.org/10.1007/BF02050307*
9. *Goh R, Goh D, Ellepola H. Perineal tears-A review. Aust J Gen 2018; 47: 35-8. https://doi.org/10.31128/AFP-09-17-4333*
10. *Committee on Practice Bulletins-Obstetrics. ACOG Practice Bulletin No. 198: Prevention and management of obstetric lacerations at vaginal delivery. Obstet Gynecol 2018; 132(3): e87-e102. https://doi.org/10.1097/AOG.0000000000002841*
11. *Villot A, X Deffieux X, Demoulin G, Rivain A-L, Trichot C, Thubert T. Management of third and fourth degree perineal tears: A systematic review. J Gynecol Obstet Biol Reprod 2015; 44: 802-11.*
12. *Goetz LH, Lowry AC. Overlapping sphincteroplasty: Is it the standard of care? Clin Colon Rectal Surg 2005; 18: 22-31. https://doi.org/10.1055/s-2005-864072*
13. *Cera SM, Wexner SD. Anal Sphincter Repair. In: Davila GW, Ghoniem GM, Wexner SD. Pelvic Floor Dysfunction. Springer, London, 2009: 143-9. https://doi.org/10.1007/1-84628-010-9_23*
14. *Sultan AH. Obstetrical perineal injury and anal incontinence. AVMA Medical & Legal Journal, 1999; 5: 193-6. https://doi.org/10.1177/135626229900500601*
15. *Spinelli A, Laurenti V, Carrano FM, Gonzalez-Díaz E, Borycka-Kiciak K. Diagnosis and treatment of obstetric anal sphincter injuries: New evidence and perspectives. J Clin Med 2021; 10: 3261. https://doi.org/10.3390/jcm10153261*
16. *Fenner DE, Genberg B, Brahma P, Marek L, DeLancey JOL. Fecal and urinary incontinence after vaginal delivery with anal sphincter disruption in an obstetrics unit in the United States. Am J Obstet Gynecol 2003; 189: 1543-9. https://doi.org/10.1016/j.ajog.2003.09.030*
17. *Lowder JL, Burrows LJ, Krohn MA, Weber AM. Risk factors for primary and subsequent anal sphincter lacerations: A comparison of cohorts by parity and prior mode of delivery. Am J Obstet Gynecol 2007; 196: 344.e1-5. https://doi.org/10.1016/j.ajog.2006.10.893*
18. *Baghestan E, Irgens LM, Børdahl PE, Rasmussen S. Trends in risk factors for obstetric anal sphincter injuries in Norway. Obstet Gynecol 2010; 116: 25-34. https://doi.org/10.1097/AOG.0b013e3181e2f50b*
19. *Gurol-Urganci I, Cromwell DA, Edozien LC, Mahmood TA, Adams EJ, Richmond DH, et al. Third-and fourth-degree perineal tears among primiparous women in England between 2000 and 2012: time trends and risk factors. BJOG 2013; 120: 1516-25. https://doi.org/10.1111/1471-0528.12363*
20. *Stock L, Basham E, Gossett DR, Lewicky-Gaupp C. Factors associated with wound complications in women with obstetric anal sphincter injuries (OASIS). Am J Obstet Gynecol 2013; 208: 327.e1-6. https://doi.org/10.1016/j.ajog.2012.12.025*
21. *Jha S, Parker V. Risk factors for recurrent obstetric anal sphincter injury (rOASI): A systematic review and meta-analysis. Int Urogynecol J 2016; 27: 849-57. https://doi.org/10.1007/s00192-015-2893-4*
22. *Coats PM, Chan KK, Wilkins M, Beard RJ. A comparison between midline and mediolateral episiotomies. Br J Obstet Gynaecol 1980; 87: 408-12. https://doi.org/10.1111/j.1471-0528.1980.tb04569.x*
23. *Adams EJ, Bricker L, Richmond DH, Neilson JP. Systematic review of third degree tears: Risk factors. Int Urogynecol J Pelvic Floor Dysfunct 2001; 12(Suppl 3): 12.*
24. *Mayer AR, Nelson BE, Banerjee SR. Anal incontinence. Glob Libr Women's Med 2009.*
25. *Abdool Z, Sultan AH, Thakar R. Ultrasound imaging of the anal sphincter complex: A review. Br J Radiol 2012; 85: 865-75. https://doi.org/10.1259/bjr/27314678*

26. *Fernando RJ, Sultan AH, Kettle C, Thakar R. Methods of repair for obstetric anal sphincter injury. Cochrane Database Syst Rev 2013; 12: CD002866. https://doi.org/10.1002/14651858.CD002866.pub3*

27. *Harvey MA, Pierce M, Alter JE, Chou Q, Diamond P, Epp A, et al. Obstetrical anal sphincter injuries (OASIS): Prevention, recognition, and repair. J Obstet Gynaecol Can 2015; 37: 1131-48. https://doi.org/10.1016/S1701-2163(16)30081-0*

28. *Paquette IM, Varma MG, Kaiser AM, Steele SR, Rafferty JF. The American Society of Colon and Rectal Surgeons' clinical practice guideline for the treatment of fecal incontinence. Dis Colon Rectum 2015; 58: 623-36. https://doi.org/10.1097/DCR.0000000000000397*

29. *Kaiser AM, Orangio GR, Zutshi M, Alva S, Hull TL, Marcello PW, et al. Current status: New technologies for the treatment of patients with fecal incontinence. Surg Endosc 2014; 28: 2277-301. https://doi.org/10.1007/s00464-014-3464-3*

ORİJİNAL ÇALIŞMA-ÖZET
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Anal sfinkter onarımında overlapping ve direk apozisyon sfinkteroplasti tekniklerinin sonuçlarının karşılaştırılması

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ÖZET

Giriş ve Amaç: Anal sfinkter hasarının onarımında sfinkteroplasti büyük önem taşımaktadır. Bu çalışmada anal sfinkter onarımında kullanılan örtüşen sfinkteroplasti ve direkt apozisyon tekniklerinin sonuçlarını değerlendirmeyi amaçladık.

Gereç ve Yöntem: 2011-2021 yılları arasında anal sfinkter yaralanması nedeniyle sfinkteroplasti uygulanan 36 hasta retrospektif olarak analiz edildi. Yaş, cinsiyet, etyolojik faktör, laserasyon derecesi, onarım tekniği, postoperatif komplikasyonlar, yaralanma ile onarım arasında geçen süre, hastanede yatış süresi, takip süresi, postoperatif Cleveland Kliniği İnkontinans Skoru (CKİS) değerlendirildi. İki teknik SPSS versiyon 17,0 ile istatistiksel olarak karşılaştırıldı.

Bulgular: Hastaların 31'i kadın, beşi erkekti ve yaş ortalaması 31,50 ± 6,7 yıl idi. Yirmi beş hastada obstetrik travma, yedi hastada perianal girişim, diğer dört hastada ise travma etyolojik faktördü. Overlapping tekniği 14 hastaya, direk apozisyon tekniği ise 22 hastaya uygulanmıştı. Tüm olguların ortalama postoperatif CKİS 5,53 ± 2,59 idi. Overlapping sfinkteroplastide CKİS, apozisyon onarımına göre anlamlı ölçüde daha düşüktü (p= 0,006). Sfinkter hasarı ile onarım arasında geçen süre azaldıkça postoperatif CKİS'nin de düştüğü gözlendi (p< 0,001; r= 0,625).

Sonuç: Anal sfinkter yaralanmalarını erken dönemde onarmak oldukça önemlidir. Overlapping ve direk apozisyon teknikleri sfinkter onarımında güvenilir yöntemlerdir. Ayrıca fekal inkontinans açısından overlapping sfinkteroplastinin sonuçları direk apozisyon tekniğinden daha iyidir.

Anahtar Kelimeler: Anal sfinkter hasarı, direk apozisyon, fekal inkontinans, overlapping sfinkteroplasti

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