ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE
KADIN HASTALIKLARI VE DOĞUM / OBSTETRICS AND GYNAECOLOGY

ATLJM 2025; 5 (14): 204-210
https://doi.org/10.54270/atljm.2025.101

EVALUATION OF RISK FACTORS, SURGICAL REPAIR TECHNIQUES, AND POSTOPERATIVE OUTCOMES IN PATIENTS WITH OBSTETRIC ANAL SPHINCTER INJURY: A RETROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Aim: This study aims to evaluate the risk factors, surgical repair techniques, and postoperative outcomes of third- and fourth-degree obstetric anal sphincter injuries (OASIS).
Materials and Methods: This retrospective observational study included 29 patients who underwent primary sphincteroplasty for OASIS. Data were collected from hospital electronic records and operative reports. Variables such as degree of laceration, repair technique (end-to-end or overlapping), suture material, and postoperative complications were analyzed. Functional outcomes were assessed using the Wexner fecal incontinence score when available.
Results: OASIS patients had a mean age of 25.6 ± 5.4 years and a mean body mass index of 27.2 ± 4.0 kg/m^2; 69% were primiparous. The mean fetal birth weight was 3424.8 ± 335.9 g, labor was induced in 13 patients (44.8%), and episiotomy was performed in 19 (65.5%). Type 3B tears were the most common (48.3%). The end-to-end technique was used in 69% of cases, and Vicryl was the most commonly used suture material. Among the 9 patients with available Wexner scores, 3 reported no fecal incontinence, while 2 had a score of 8. The majority of repairs were performed by obstetricians.
Conclusion: In our study, 69% of OASIS patients were primiparous, and episiotomy was performed in 65.5% of cases. The most common tears were type 3B, with most repairs performed by obstetricians using the end-to-end technique and delayed absorbable sutures. Functional outcomes were limited, and more comprehensive, long-term studies are needed.
Keywords: fecal incontinence, perineal laceration, sphincter repair, Wexner scoring

OBSTETRİK ANAL SFİNKTER YARALANMASI OLAN HASTALARDA RİSK FAKTÖRLERİ, CERRAHİ ONARIM TEKNİKLERİ VE POSTOPERATİF SONUÇLARIN DEĞERLENDİRİLMESİ: RETROSPEKTİF GÖZLEMSEL BİR ÇALIŞMA

ÖZET

Amaç: Bu çalışmanın amacı, üçüncü ve dördüncü derece obstetrik anal sfinkter yaralanmalarının (OASIS) risk faktörlerini, cerrahi onarım tekniklerini ve postoperatif sonuçlarını değerlendirmektir.
Gereç ve Yöntemler: Bu retrospektif gözlemsel çalışma, üçüncü veya dördüncü derece perineal yırtığı nedeniyle primer sfinkteroplasti yapılan 29 hastayı kapsamaktadır. Klinik veriler, elektronik hasta kayıtları ve ameliyat notlarından elde edilmiştir. Perineal yırtık derecesi, uygulanan onarım tekniği (uç uca veya üst üste), sütür materyali ve postoperatif semptomlar analiz edilmiştir. Fonksiyonel sonuçlar Wexner fekal inkontinans skoru ile değerlendirilmiştir.
Bulgular: OASIS hastalarının ortalama yaşı 25,6 ± 5,4 yıl ve ortalama vücut kitle indeksi 27,2 ± 4,0 kg/m^2 idi; %69'u primipardı. Ortalama fetal doğum ağırlığı 3424,8 ± 335,9 g, doğum eylemi 13 hastada (%44,8) başlatılmış ve 19 hastaya (%65,5) epizyotomi uygulanmıştı. En yaygın yırtık tipi %48,3 ile 3B idi. Onarımların %69'unda uç uca teknik kullanıldı; en sık tercih edilen sütür materyali ise Vicryl oldu. Wexner skorları mevcut olan 9 hastanın 3'ünde fekal inkontinans bulunmazken, 2 hastada skor 8 olarak kaydedildi. Onarımların çoğu kadın doğum uzmanları tarafından gerçekleştirildi.
Sonuç: Çalışmamızda OASIS hastalarının %69'u primipardı ve vakaların %65,5'ine epizyotomi uygulanmıştı. En sık görülen yırtık tipi 3B olup, onarımların çoğu obstetrisyenler tarafından uç uca teknik ve gecikmeli emilen sütürler kullanılarak yapılmıştı. Fonksiyonel sonuçlar sınırlı olup, daha kapsamlı ve uzun dönem çalışmalara ihtiyaç vardır.
Anahtar Kelimeler: fekal inkontinans, perineal laserasyon, sfinkter onarımı, Wexner skorlaması

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DAĞDEVİREN E, TERCAN C, YENİOCAK AS, KIRIT H, YELKENCİ C, DEMİRAĞ TA, KARADEMİR Y. EVALUATION OF RISK FACTORS, SURGICAL REPAIR TECHNIQUES, AND POSTOPERATIVE OUTCOMES IN PATIENTS WITH OBSTETRIC ANAL SPHINCTER INJURY: A RETROSPECTIVE OBSERVATIONAL STUDY. ATLJM. 2025;5(14):204-210.

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Gönderim Tarihi: 10 AĞUSTOS 2025
Kabul Tarihi: 23 EKİM 2025

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INTRODUCTION

The majority of approximately 140 million births that occur globally every year are among women without risk factors for complications for themselves or their babies at the beginning and throughout labour (1). Despite advances in obstetric care, childbirth remains a critical period for maternal and neonatal well-being, during which complications may significantly increase the risk of morbidity and mortality. Spontaneous vaginal delivery, although the most common and physiologic mode of birth, is not without risk. Common maternal complications include perineal laceration, cervical injury, and postpartum hemorrhage (2). Among these, obstetric anal sphincter injuries (OASIS) comprising third- and fourth-degree perineal tears, stand out as particularly impactful due to their long-term repercussions on quality of life, such as fecal incontinence, sexual dysfunction, and psychosocial distress (3). The apparent rise in OASIS incidence in recent decades is thought to be attributable to enhanced diagnostic techniques, refined classification systems, and increased clinician awareness (3, 4). Reported OASIS incidence rates vary widely in the literature, ranging from 0.1% to 10.9% depending on population and diagnostic methodology (3). Several independent risk factors have been identified, including primiparity, instrumental delivery (particularly vacuum or forceps), high birthweight (>4000 g), increasing maternal age, decreased maternal height, and a history of cesarean section (4, 5). Conversely, smoking and lower maternal education levels have been associated with reduced OASIS risk, though these associations may reflect disparities in health care provision rather than true protective effects (5). The role of mediolateral episiotomy remains controversial: while it may reduce OASIS risk during instrumental deliveries, it has been shown to increase the risk during spontaneous vaginal births (4).

The diagnosis of OASIS relies primarily on meticulous perineal inspection and digital anorectal examination immediately following delivery (6). Imaging modalities such as endoanal ultrasound may assist in the detection of occult injuries, though their use remains limited in routine practice due to logistical constraints (6, 7). Immediate surgical repair is the standard treatment, typically performed using overlapping or end-to-end techniques, often accompanied by prophylactic antibiotics to reduce postoperative wound complications (6, 8). Long-term follow-up is essential, given the potential for persistent functional impairment. The Wexner score, a validated and widely used questionnaire, is employed to evaluate the degree of fecal incontinence. It consists of multiple items assessing the frequency and severity of incontinence episodes, and demonstrates strong correlation with objective anal sphincter function tests. A Turkish version of the Wexner scale has been validated, proving reliable and consistent for use in the Turkish-speaking population (9).

Our aim is to provide a comprehensive overview of our institutional experience with the diagnosis, surgical repair, and follow-up of OASIS cases in a tertiary obstetric unit.

MATERIALS AND METHODS

This retrospective observational study was conducted at the tertiary-level obstetrics and gynecology clinic of our hospital. The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board (Ethics Committee) of Basaksehir Cam and Sakura City Hospital, Istanbul, Turkey (Approval No: KAEK/09.07.2025.184, Date:29.07.2025). Data collection was performed from patients who delivered vaginally between June 2024 and June 2025, using the hospital's electronic medical records system and surgical notes. The study population consisted of female patients who experienced third- or fourth-degree perineal tears during vaginal delivery and underwent primary sphincteroplasty. Inclusion criteria were: documented third- or fourth-degree perineal laceration, sphincter repair performed at the same institution, and delivery and surgical data available. Exclusion criteria included cesarean deliveries, patients without perineal injury, and deliveries conducted outside the institution with incomplete records.

A wide range of variables related to obstetric anal sphincter injuries (OASIS) were evaluated. Demographic data included maternal age, body mass index (BMI), gravidity, and parity. Delivery-related variables encompassed the presence and type of episiotomy, induction of labor, operative delivery, fetal presentation (e.g., occiput posterior), fetal weight, gestational age, and the medical specialty of the delivering physician (obstetrician, general surgeon, or pediatric surgeon). Additionally, certain complications such as shoulder dystocia, clavicle fracture, uterine rupture, cervical laceration, and vaginal lateral wall laceration were recorded. Postpartum variables included hemoglobin drop ≥2 g/dL or the need for blood transfusion, and prophylactic

enoxaparin administration. Injury-related characteristics included the degree of perineal tear, classified as 3A, 3B, 3C, or fourth-degree, as well as the suture technique employed (end-to-end or overlapping), the type of suture material used (e.g., Vicryl (Polyglactin 910), PDS (Polydioxanone), Monocryl (Poliglecaprone 25)), and the suture size (e.g., 2/0 or other). Postoperative outcomes were evaluated based on clinical records, including findings from digital rectal examination (e.g., rectal tone), patient-reported symptoms such as gas or fecal incontinence, perineal pain, and dyspareunia. All data were retrospectively obtained through the hospital's automation system and operative records. The classification of injuries was based on the standardized perineal laceration classification. Additionally, the Wexner Fecal Incontinence Score was used, when available, to quantitatively assess fecal incontinence.

All statistical analyses were performed using SPSS software (version 27; SPSS Inc., Chicago, IL, USA). Descriptive statistics were reported as mean ± standard deviation for normally distributed continuous variables and as median (min–max) for non-normally distributed variables. Categorical variables were reported as n (%). The Shapiro–Wilk test was used to assess the normality of data distribution.

FINDINGS

Among 6,487 vaginal deliveries, 65 patients with OASIS were identified (1%). 36 OASIS patients were excluded due to incomplete data. A total of 29 patients diagnosed with OASIS were included. The mean age was 25.6 ± 5.4 years, and the mean BMI was 27.2 ± 4.0 kg/m^2. Median gravidity was 1 (range: 1–4), parity was 0 (range: 0–2), and gestational age at delivery was 281 days (range: 245–320). Of the patients, 69% were primiparous. The mean fetal birth weight was 3424.8 ± 335.9 g. Labor was induced in 13 patients (44.8%), and episiotomy was performed in 19 (65.5%). Operative vaginal delivery occurred in 1 case (3.5%), while shoulder dystocia, occiput posterior presentation, and uterine rupture were each observed in 1 patient (3.5%). Clavicle fracture occurred in 2 cases (6.9%), cervical laceration in 3 (10.3%), and vaginal lateral wall laceration in 2 (6.9%). Hemoglobin drop ≥2 g/dL or the need for blood transfusion was recorded in 18 patients (62.1%), and postpartum enoxaparin prophylaxis was administered in 21 cases (72.4%) (Table 1).

Table 1: Demographic and Obstetric Characteristics of Patients with OASIS

Data	Mean ± SD or Median (Minimum–Maximum) or Number (Percentage%) (n=29)
Age[a] (years)	25.64±5.44
BMI[a] (kg/m2)	27.22 ± 3.97
Gravidity[b]	1 (1-4)
Parity[b]	0 (0-2)
Gestational age[b] (day)	281 (245-320)
Fetal weight[a] (g)	3424.81±335.85
Induced labor[c] (n)	13 (44.83%)
Episiotomy[c] (n)	19 (65.52%)
Operative delivery[c] (n)	1 (3.49%)
Shoulder dystocia[c] (n)	1 (3.49%)
Occiput posterior presentation[c] (n)	1 (3.49%)
Clavicle fracture[c] (n)	2 (6.90%)
Uterine rupture[c] (n)	1 (3.49%)
Cervical laceration[c] (n)	3 (10.34%)
Vaginal lateral wall laceration[c] (n)	2 (6.90%)
Hemoglobin drop ≥ 2 g/dL or blood transfusion[c] (n)	18 (62.07%)
Postpartum enoxaparin prophylaxis[c] (n)	21 (72.41%)

Abbreviations: BMI, body mass index; OASIS, Obstetric Anal Sphincter Injuries
[a] Normal distribution, Mean ± SD
[b] Non-normal distribution, Median (Minimum–Maximum)
[c] Categorical data, Number (Percentage%)

Perineal laceration was classified as 3A in 6 patients (20.7%), 3B in 14 (48.3%), 3C in 4 (13.8%), and 4th-degree in 5 patients (17.2%). Repairs were performed by obstetricians in 18 cases (62.1%), general surgeons in 10 (34.5%), and a pediatric surgeon in 1 case (3.4%). The end-to-end repair technique was used in 20 patients (69.0%), and the overlapping technique in 9 (31.0%). The most commonly used suture material was Vicryl (Polyglactin 910), employed in 20 cases (69.0%), followed by PDS (Polydioxanone) in 7 (24.1%) and Monocryl (Poliglecaprone 25) in 2 (6.9%). Suture size was 2/0 in 23 repairs (79.3%) and non–2/0 in 6 (20.7%) (Table 2).

Table 2: Operative Details of OASIS Repair	
Data	**Number (Percentage%) (n=29)**
Degree of Obstetric Perineal Laceration	
3A (<50% EAS tear)	6 (20.69%)
3B (>50% EAS tear)	14 (48.28%)
3C (EAS and IAS torn)	4 (13.79%)
4 (EAS, IAS, and anal mucosa involved)	5 (17.24%)
Operating Surgeon	
Obstetrics and Gynecology	18 (62.07%)
General Surgery	10 (34.48%)
Pediatric Surgery	1 (3.45%)
Surgical Repair Technique	
End-to-End Approach	20 (68.97%)
Overlapping Approach	9 (31.03%)
Suture Type	
Vicryl (Polyglactin 910)	20 (68.97%)
PDS (Polydioxanone)	7 (24.14%)
Monocryl (Poliglecaprone 25)	2 (6.90%)
Suture Size	
2/0	23 (79.31%)
Non-2/0	6 (20.69%)
Abbreviations: EAS, external anal sphincter; IAS, internal anal sphincter; OASIS, Obstetric Anal Sphincter Injuries	

Wexner fecal incontinence scores were available for 9 patients. The scores were 8 in 2 patients, 7 in 1, 5 in 2, 4 in 1, and 0 in 3 patients. Notably, both patients with a score of 8 had 3B lacerations. All patients with a Wexner score of 0 had sustained 3A, 3B, or 3C injuries, and underwent end-to-end or overlapping repair with either Vicryl or PDS (Table 3).

DISCUSSION

Most patients with OASIS were primiparous, and deliveries occurred at term. The most common type of laceration was 3B (48.3%), and the end-to-end repair technique was used in 69% of cases. The majority of repairs were performed by obstetricians, with Vicryl being the most frequently used suture material. Functional outcomes were assessed in 9 patients using the Wexner score; the highest scores (8) were observed in patients with 3B lacerations. Patients with a Wexner score of 0 had sustained 3A–3C injuries and had undergone standard repairs.

The demographic and obstetric characteristics in our study largely mirror previously published findings on OASIS. The median parity was zero, and nearly all patients were either primiparous or in early gravidity, consistent with the established understanding that primiparity is a significant risk factor for OASIS (10-14) (Table 1). Our observed mean maternal age of 25.6 years is slightly lower than that reported in larger population-based studies (15). In line with prior literature, episiotomy was common in our series, performed in 65.5% of patients. This supports earlier findings that episiotomy, although its protective effect against OASIS is controversial. While midline episiotomy is more strongly associated with OASIS, mediolateral incisions can also extend into the anal sphincter complex (15, 16). Although only one case of operative vaginal delivery was documented in our cohort (3.5%), the overall low rate limits comparison with larger studies where forceps and vacuum deliveries have been identified as strong contributors to OASIS, with forceps in particular associated with the highest risk (17). Similarly, shoulder dystocia, occiput posterior presentation, and macrosomia were infrequent, aligning with our moderate mean fetal weight (3425g) and likely contributing to the relatively low incidence of fourth-degree tears (17.2%) compared to previous studies (18, 19). In a study conducted at our clinic, factors significantly associated with cesarean section included multiple births, preterm delivery, induced labor or cesarean section before labor, fetal breech presentation, multiple gestations, and extreme birth weights (<1000 g or >4500 g) (20). This changing obstetric profile may influence the incidence of OASIS in our clinic.

Regarding the classification of perineal injury, our data revealed a predominance of third-degree tears, especially type 3B (48.3%) with fewer cases of type 3A (20.7%) and 3C (13.8%) (Table 2). This distribution aligns with patterns described in the literature, where third-degree lacerations outnumber fourth-degree injuries (21, 22). As for surgical management, the end-to-end repair technique was used in the majority of cases (69%), consistent with widespread practice trends.

Table 3: Surgical Repair Characteristics in Patients Assessed by Wexner Fecal Incontinence Score					
Patient number	**Wexner Fecal Incontinence Score**	**Degree of Obstetric Perineal Laceration***	**Operating Surgeon**	**Surgical Repair Technique**	**Suture Type and Size**
1	8	3B	Obstetrics and Gynecology	End-to-End Approach	2/0 Vicryl (Polyglactin 910)
2	8	3B	Obstetrics and Gynecology	Overlapping Approach	2/0 Vicryl (Polyglactin 910)
3	7	3C	Obstetrics and Gynecology	End-to-End Approach	2/0 Vicryl (Polyglactin 910)
4	5	4	General Surgery	End-to-End Approach	2/0 Vicryl (Polyglactin 910)
5	5	3B	Obstetrics and Gynecology	End-to-End Approach	2/0 Vicryl (Polyglactin 910)
6	4	4	General Surgery	End-to-End Approach	2/0 Vicryl (Polyglactin 910)
7	0	3A	General Surgery	End-to-End Approach	0 Vicryl (Polyglactin 910)
8	0	3C	Obstetrics and Gynecology	End-to-End Approach	2/0 Vicryl (Polyglactin 910)
9	0	3B	Obstetrics and Gynecology	Overlapping Approach	3/0 PDS (Polydioxanone)

Obstetric perineal laceration grades: 3A (<50% EAS tear), 3B (>50% EAS tear), 3C (EAS and IAS torn), 4 (EAS, IAS, and anal mucosa involved). EAS, external anal sphincter; IAS, internal anal sphincter.

The use of delayed absorbable sutures such as Vicryl is in line with current guideline recommendations (23). However, the presence of multiple suture types and sizes in our sample suggests variation in technique that may reflect differences in surgeon preference or training. Short-term functional outcomes, as measured by the Wexner Fecal Incontinence Score, revealed a spectrum from complete continence (score = 0) to moderate symptoms (score = 8). These findings are consistent with prior research reporting variable rates of postpartum fecal incontinence, ranging from 0% to 28% among women with prior OASIS (24). Although our sample size for symptom assessment was small, it appears that patients with higher-degree lacerations (e.g., 3C or 4) and those managed with end-to-end repair tended to report higher incontinence scores. While definitive conclusions cannot be drawn, this trend echoes literature indicating worse long-term outcomes for higher-grade tears and suggesting potential advantages of overlapping repair in selected cases (22). Another notable finding is that the majority of repairs were performed by obstetricians (62.1%), although general surgeons managed more than one-third of the cases. While this interdisciplinary approach may offer positive contributions, further studies are needed to evaluate the impact of surgical specialty on long-term continence and sexual function outcomes.

Effective surgical management of third- and fourth-degree obstetric perineal lacerations is vital not only for anatomical reconstruction but also for the long-term preservation of anal continence. The overarching goal is to restore the structural and functional integrity of the anal sphincter complex and perineal body, which

are critical for maintaining continence and reducing long-term morbidity (25). Anatomically correct repair begins with adequate visualization. Packing the vagina and using self-retaining retractors, especially when assistance is limited, can enhance exposure and reduce intraoperative complications due to bleeding (25). A key principle in the surgical approach is multilayer closure, ensuring that each disrupted layer, including anal mucosa, internal anal sphincter (IAS), and external anal sphincter (EAS) is precisely identified and separately repaired to prevent wound dehiscence and optimize functional outcomes (25-28). The perineal body and rectovaginal septum must also be adequately reconstructed to reinforce the repair and provide mechanical support between the anorectum and vagina (25). In our study, layered repair using appropriate techniques and suture materials was consistently applied in patients undergoing OASIS repair. The internal sphincter was carefully identified and approximated, often with continuous sutures of polyglactin or monofilament material, consistent with recommended methods for maintaining tensile strength and minimizing ischemic damage (25, 27, 28).

In the surgical repair of the EAS, end-to-end or overlapping repair is an important point of choice. While meta-analyses and randomized trials have not established clear superiority of either method, some studies have shown transient benefits of overlapping repair in terms of reducing early postpartum symptoms of incontinence (29). However, more recent trials limited to primiparous women have not replicated these findings; in fact, some suggest a higher rate of flatal incontinence (involuntary passage of gas) and fecal incontinence with the overlap method in certain subgroups (30, 31). Our cohort showed comparable continence outcomes using both methods, as evidenced by Wexner scores in patients who underwent either technique (Table 3), reinforcing the idea that surgeon experience and comfort with the chosen method may be more critical than the method itself (31, 32). After sphincter repair, the emphasis shifts to reconstructing the distal rectovaginal septum and perineal body. This structural reinforcement protects against suture erosion, supports soft tissue healing, and helps maintain vaginal-anal spacing, all of which are essential for long-term repair success (25). In our series, the perineal body was consistently rebuilt using interrupted absorbable sutures, a practice aligned with international standards (25). Individualized, anatomy-focused, and technically meticulous repair is crucial in OASIS reconstruction. Adhering to principles such as layered closure, accurate identification of tissue planes, and appropriate selection of repair technique can contribute to favorable continence outcomes, even in complex tears. Assessment of female sexual function after surgery is of great importance. Similarly, significant improvements in female sexual function have been reported following vaginal rejuvenation surgery, highlighting the potential functional benefits of surgical interventions on sexual health (33).

Our study has some limitations. The sample size is small, and functional outcomes could only be assessed in a limited number of patients due to the availability of Wexner scores in few cases. The absence of a control group and heterogeneity in surgical practices (differences in techniques and materials) restrict the generalizability of the results. Additionally, the lack of long-term follow-up data prevents evaluation of late complications and permanent outcomes. There are still areas in OASIS repair that require further research to improve patient outcomes. Large randomized studies comparing long-term results of end-to-end versus overlap repair techniques, stratified by parity and severity, are needed. The effectiveness of suture materials and adjunct therapies such as biological grafts and regenerative approaches remains insufficiently explored. Long-term follow-up studies assessing continence, quality of life, and sexual function are also essential.

CONCLUSION

In our study, 69% of OASIS patients were primiparous, and episiotomy was performed in 65.5% of the cases. Type 3B tears were the most common in OASIS repairs, with most procedures performed by obstetricians using the end-to-end technique and delayed absorbable sutures. Functional outcomes were assessed in a limited number of patients. Due to the small sample size, lack of a control group, variability in surgical techniques, and absence of long-term follow-up, more comprehensive and long-term studies are needed.

DECLARATIONS

Conflicts of Interest

The authors declare no conflicts of interest.

Authorship Contribution

Conception and design – E.D., A.S.Y., C.Y., T.A.D., Y.K.; Organization of the conduct of the study – E.D., C.T., A.S.Y., H.K., C.Y., T.A.D., Y.K.; Data collection – E.D., C.T., H.K., C.Y., T.A.D., Y.K.; Data analysis – E.D., C.T.; Manuscript writing – E.D., C.T., A.S.Y. All authors approved the final version of the manuscript in all aspects.

Ethics Committee Approval

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board (Ethics Committee) of Basaksehir Cam and Sakura City Hospital, Istanbul, Turkey (Approval No: KAEK/09.07.2025.184, Date:29.07.2025).

REFERENCES

1. Organization WH. WHO recommendations on intrapartum care for a positive childbirth experience: World Health Organization; 2018.
2. Zandvakili F, Rezaie M, Shahoei R, Roshani D. Maternal Outcomes Associated with Caesarean versus Vaginal Delivery. J Clin Diagn Res. 2017;11(7):Qc01-qc4.
3. Košec V, Djaković I, Čukelj M, Ejubović E, Sumpor B, Djaković Ž. INCREASED OASIS INCIDENCE - INDICATOR OF THE QUALITY OF OBSTETRIC CARE? Acta Clin Croat. 2019;58(2):365-70.
4. Marschalek ML, Worda C, Kuessel L, Koelbl H, Oberaigner W, Leitner H, et al. Risk and protective factors for obstetric anal sphincter injuries: A retrospective nationwide study. Birth (Berkeley, Calif). 2018;45(4):409-15.
5. André K, Leijonhufvud Å, Ignell C, Källén K, Stuart A. Minimizing tearing during vaginal delivery with a perineal protection device: a randomized controlled trial. American Journal of Obstetrics & Gynecology MFM. 2024;6(9):101402.
6. RCOG N. The management of third-and fourth-degree perineal tears. Green-Top Guideline No. 2015;29.
7. Walsh KA, Grivell RM. Use of endoanal ultrasound for reducing the risk of complications related to anal sphincter injury after vaginal birth. Cochrane Database Syst Rev. 2015;2015(10):Cd010826.
8. Faltin DL, Boulvain M, Floris LA, Irion O. Diagnosis of anal sphincter tears to prevent fecal incontinence: a randomized controlled trial. Obstet Gynecol. 2005;106(1):6-13.
9. Cam C, Selcuk S, Asoglu MR, Tug N, Akdemir Y, Ay P, et al. Validation of the Wexner scale in women with fecal incontinence in a Turkish population. International Urogynecology Journal. 2011;22(11):1375-9.
10. Fenner DE, Genberg B, Brahma P, Marek L, DeLancey JO. 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(6):1543-9; discussion 9-50.
11. Aiken CE, Aiken AR, Prentice A. Influence of the duration of the second stage of labor on the likelihood of obstetric anal sphincter injury. Birth. 2015;42(1):86-93.
12. Meister MR, Cahill AG, Conner SN, Woolfolk CL, Lowder JL. Predicting obstetric anal sphincter injuries in a modern obstetric population. Am J Obstet Gynecol. 2016;215(3):310.e1-7.
13. Pergialiotis V, Bellos I, Fanaki M, Vrachnis N, Doumouchtsis SK. Risk factors for severe perineal trauma during childbirth: An updated meta-analysis. Eur J Obstet Gynecol Reprod Biol. 2020;247:94-100.
14. Gundabattula SR, Surampudi K. Risk factors for obstetric anal sphincter injuries (OASI) at a tertiary centre in south India. Int Urogynecol J. 2018;29(3):391-6.
15. Ramm O, Woo VG, Hung YY, Chen HC, Ritterman Weintraub ML. Risk Factors for the Development of Obstetric Anal Sphincter Injuries in Modern Obstetric Practice. Obstet Gynecol. 2018;131(2):290-6.
16. Pergialiotis V, Vlachos D, Protopapas A, Pappa K, Vlachos G. Risk factors for severe perineal lacerations during childbirth. Int J Gynaecol Obstet. 2014;125(1):6-14.
17. Hirsch E, Haney EI, Gordon TE, Silver RK. Reducing high-order perineal laceration during operative vaginal delivery. Am J Obstet Gynecol. 2008;198(6):668.e1-5.
18. de Leeuw JW, Struijk PC, Vierhout ME, Wallenburg HC. Risk factors for third degree perineal ruptures during delivery. Bjog. 2001;108(4):383-7.
19. Chill HH, Lipschuetz M, Atias E, Shwartz T, Shveiky D, Karavani G. Association between birth weight and head circumference and obstetric anal sphincter injury severity. Eur J Obstet Gynecol Reprod Biol. 2021;265:119-24.
20. Guner G, Yeniocak AS. A cross-sectional analysis of caesarean sections according to Robson 10-group classification system: experience from a tertiary centre in Turkiye. BMC pregnancy and childbirth. 2025;25(1):674.
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(6):849-57.
22. Hehir MP, O'Connor HD, Higgins S, Robson MS, McAuliffe FM, Boylan PC, et al. Obstetric anal sphincter injury, risk factors and method of delivery - an 8-year analysis across two tertiary referral centers. J Matern Fetal Neonatal Med. 2013;26(15):1514-6.
23. Elsaid N, Thomas GP, Carrington EV, Fernando RJ, Vaizey CJ. A UK wide survey of general surgeons' experience of the primary repair of obstetric anal sphincter injuries. Colorectal Disease. 2025;27(1):e17244.
24. Richter HE, Nager CW, Burgio KL, Whitworth R, Weidner AC, Schaffer J, et al. Incidence and Predictors of Anal Incontinence After Obstetric Anal Sphincter Injury in Primiparous Women. Female Pelvic Med Reconstr Surg. 2015;21(4):182-9.
25. Delancey JO, Toglia MR, Perucchini D. Internal and external anal sphincter anatomy as it relates to midline obstetric lacerations. Obstet Gynecol. 1997;90(6):924-7.
26. ACOG Practice Bulletin No. 198: Prevention and Management of Obstetric Lacerations at Vaginal Delivery. Obstet Gynecol. 2018;132(3):e87-e102.
27. Lindqvist PG, Jernetz M. A modified surgical approach to women with obstetric anal sphincter tears by separate suturing of external and internal anal sphincter. A modified approach to obstetric anal sphincter injury. BMC Pregnancy Childbirth. 2010;10:51.
28. Mahony R, Behan M, Daly L, Kirwan C, O'Herlihy C, O'Connell PR. Internal anal sphincter defect influences continence outcome following obstetric anal sphincter injury. Am J Obstet Gynecol. 2007;196(3):217.e1-5.
29. Fernando RJ, Sultan AH, Kettle C, Thakar R. Methods of repair for obstetric anal sphincter injury. Cochrane Database Syst Rev. 2013;2013(12):Cd002866.
30. 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(4):803-8.
31. Rygh AB, Körner H. The overlap technique versus end-to-end approximation technique for primary repair of obstetric anal sphincter rupture: a randomized controlled study. Acta Obstet Gynecol Scand. 2010;89(10):1256-62.
32. Dudding TC, Vaizey CJ, Kamm MA. Obstetric anal sphincter injury: incidence, risk factors, and management. Ann Surg. 2008;247(2):224-37.
33. Yeniocak AS, Karakaya M, Tercan C, Dagdeviren E. Novel surgical vaginal rejuvenation technique involving cosmetic reconstruction of the vaginal outlet. Ginekologia polska. 2025.