

Delivery Trends After Obstetric Anal Sphincter Injuries

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Abstract

Aims

To investigate the influence of increasing cesarean delivery (CD) rates and the establishment of specialized perineal clinics on delivery mode and recurrence of obstetric anal sphincter injuries (OASI) in subsequent pregnancies following an initial OASI.

Methods

This retrospective cohort study analyzed women with a prior OASI with subsequent deliveries occurring in either the 2007–2012 or 2018–2022 period. While perineal clinic attendance data were limited in the earlier cohort, comprehensive clinical data were available for the latter. Statistical analysis focused on OASI recurrence and CD rates as primary outcomes.

Results

The study included 184 women in the earlier cohort (2007–2012) and 176 in the later cohort (2018–2022). Perineal clinic attendance increased from 45 (24.5%) to 82 (46.6%). Among clinic attendees, 42 (42.7%) were advised to consider CD, with 112 (63.6%) opting for it. Private obstetric care utilization rose from 24 (13.0%) to 40 (22.7%) ($p=0.01$). The elective CD rate increased from 68 (37.0%) to 99 (56.6%) ($p=0.03$), while vaginal deliveries declined from 94 (51.1%) to 58 (33.1%). OASI recurrence decreased from 5 (5.1%) to 2 (2.9%) ($p=0.28$).

Discussion

The rise in CD rates among women with prior OASI reflects a cautious approach to delivery management, influenced by counseling and patient preferences. This trend may contribute to

reduced OASI recurrence. Further research is needed to assess the long-term implications of repeat CDs and optimize strategies for high-risk individuals.

Introduction

Obstetric anal sphincter injuries (OASI) are complications of vaginal delivery that can have lasting effects on quality of life¹. Rates of OASI vary globally², with several identified risk factors^{2–4}. Specialized perineal clinics now counsel women post-OASI, assessing symptoms, evaluating anatomical defects, and advising on future deliveries^{5,6}. A prior OASI is a major risk factor for recurrence^{7,8}; yet predicting a second event remains challenging⁸. Some studies suggest subsequent vaginal deliveries, even without recurrence, may worsen faecal or flatal incontinence⁹. The Royal College of Obstetricians and Gynaecologists advises that symptomatic women or those with abnormal assessments be offered elective cesarean delivery (CD) due to recurrence or symptom deterioration risks¹⁰. Women with prior OASI are also more likely to elect for CD, regardless of symptoms¹¹. Globally, CD rates have risen from 7% in 1990 to 21% today, despite recommendations for an optimal rate of 10–15%¹². CDs are performed for maternal-fetal risks, but "maternal request" is increasingly contributing¹³. While CD is often preferred after OASI, repeat CDs carry risks for both mother and fetus¹⁴.

This study aims to explore how these shifts have impacted the mode of delivery in subsequent pregnancies following an initial OASI and to investigate the rates of recurrent OASI at our unit.

Methods

This retrospective study included women with an OASI during their index delivery, regardless of location, who had a subsequent delivery at CUMH in 2007–2012 or 2018–2022. Eligible participants had a vaginal birth at ≥ 24 weeks gestation with documented OASI. Some attended the CUMH perineal clinic postpartum or antenatally. Women with incomplete data were excluded.

Data were extracted from both physical charts and the Maternal & Newborn Clinical Management System (MNCMS) electronic database. The 2007–2012 period had limited data availability, with only perineal clinic attendance rates accessible. In contrast, the 2018–2022 period included comprehensive clinical data, such as follow-up assessments and outcomes. The perineal clinic, established in 2007, provides specialized assessments for women sustaining OASI within six months postpartum. It offers targeted care, including referrals to colorectal surgeons when needed. Women with an index delivery and OASI at the unit were scheduled for an obstetric review at 6–12 weeks postpartum, followed by a comprehensive perineal clinic assessment at 4–6 months. Women who missed the initial review or had an

index delivery elsewhere were encouraged to attend an antenatal assessment upon booking a subsequent pregnancy, ideally before 28 weeks gestation. At the clinic, sphincter function and faecal or flatal incontinence severity were assessed using the St. Marks Score (Vaizey score, 0–24). Physical examinations, including per vaginal (PV) and per rectal (PR) assessments, were conducted with consent and a chaperone. Advanced evaluations with endo-anal ultrasound (EUS) and manometry identified sphincter defects and measured resting and squeeze pressures of the internal and external anal sphincters. The primary outcome was the mode of delivery (vaginal delivery or CD) in subsequent pregnancies following OASI and the recurrence of OASI in both time periods. Secondary outcomes included perineal clinic attendance and, in the 2018-2022 cohort, patient-reported symptoms and anatomical assessment as well as advice given for next pregnancy. Due to limited clinical data for the 2007-2012 cohort, a comparative analysis of perineal clinic data between the two time periods was not feasible.

Statistical Analysis: Categorical variables were described as proportions and compared using Chi-square or Fisher's exact test. Continuous variables were summarized as mean \pm SD or median (IQR) and analyzed with Student's t-test or Mann-Whitney U test, as appropriate. A p-value <0.05 was considered significant. Analyses were performed using SPSS (v28, IBM). Ethical approval was obtained, with anonymized data and waived patient consent due to the study's retrospective nature.

Results

In the first cohort (2007-2012), there were 184 vaginal deliveries following a previous OASI, compared to 176 in the second cohort (2018-2022). Table 1 outlines maternal characteristics, the initial OASI event, and review in the CUMH perineal clinic across both cohorts. While maternal age and fetal birth weight did not significantly differ between the groups, nulliparity was significantly lower in the 2018-2022 cohort (13.1% vs. 20.7%, $p=0.05$). The distribution of OASI severity differed, with 13.1% of cases classified as 4th-degree tears in the later cohort compared to 0% in the earlier cohort ($p<0.01$). Perineal clinic attendance was significantly higher in the 2018-2022 cohort (46.6% vs. 24.5%, $p<0.01$).

Table 1: Comparison of demographics at index OASI event and perineal clinic outcomes between 2007-2012 and 2018-2022

	2007-2012, n=184	2018-2022, n=176	p-value
Maternal age, mean \pm SD	30.60 \pm 4.57	30.20 \pm 4.56	0.40
Nulliparity n (%)	38 (20.7%)	23 (13.1%)	0.05

Fetal birth weight, grams, Mean±SD		3740.80±455.01	3698.39±478.63	0.58
Degree of OASI, n (%)	3A	49 (26.6%)	50 (28.4%)	<0.01
	3B	19 (10.3%)	45 (25.6%)	
	3C	5 (2.7%)	14 (8.0%)	
	3rd unspecified	111 (60.3%)	44 (25.0%)	
	4	0 (0.0%)	23 (13.1%)	
Perineal clinic attendance, n (%)		45 (24.5%)	82 (46.6%)	<0.01
Faecal symptoms, n (%) *		NA	11 (13.4%)	NA
St. Marks score, median (IQR) *		NA	0 (0-2)	NA
Rest pressure, Median (IQR) *		NA	36 (28-49)	NA
Squeeze pressure mmHG, Median (IQR) *		NA	59 (47-79)	NA
EUS defect to internal anal sphincter, n (%) *		NA	11 (13.4%)	NA
EUS defect to external anal sphincter, n (%) *		NA	46 (59.1%)	NA
Patient referred to colorectal specialist, n (%) *		NA	0 (0.0%)	NA
Advice given to CD in next pregnancy, n (%) *		NA	42 (42.7%)	NA

OASI: Obstetric Anal Sphincter Injuries, NA: Not Available, IQR: Interquartile Range, EUS: Endoanal Ultrasound, CD: caesarean delivery

*n=82

Detailed perineal clinic data were only available for the second cohort. A minority of the 2018-2022 cohort (13.4%) reported faecal symptoms, and the median St. Marks score was 0 (IQR 0-2). Endoanal ultrasound revealed external anal sphincter defects in 59.1% of cases, and no women were referred to colorectal specialists. Regarding delivery counselling, 42 women in the later cohort (42.7%) were advised to opt for elective CD rather than a trial of labour. Table 2 presents delivery outcomes for subsequent pregnancies following OASI. In the 2018-2022 cohort, 17 women (9.7%) had persistent faecal symptoms, and 112 women (63.6%) opted for CD during antenatal clinic visits. The rate of private obstetric care was also significantly higher in the 2018-2022 cohort (22.7% vs. 13.0%, p=0.01). Induction of labour rates were higher in the earlier cohort (p=0.01).

The mode of delivery differed significantly between the cohorts: in the earlier cohort, the majority delivered vaginally, while in the later cohort, most women underwent elective CD (57.6% vs. 37.6% and 56.6% vs. 37.0%, respectively). A sub-analysis of all four delivery modes demonstrated no significant difference in rates of instrumental deliveries or in-labor CDs between the groups ($p=0.41$ and $p=0.38$, respectively). Rates of recurrent OASI were low and did not significantly differ between the cohorts (5.1% vs. 2.9%, $p=0.28$). All recurrent OASI cases were classified as third-degree tears.

Table 2: Outcomes and mode of delivery in subsequent pregnancies following OASI: A comparison between 2007-2012 and 2018-2022

		2007-2012, n=184	2018-2022, n=176	p-value
Presence of fecal symptoms prior to delivery, n (%) *		NA	17 (9.7%)	NA
Planned mode of delivery at antenatal clinic, n (%) *	Vaginal delivery	NA	64 (36.4%)	NA
	CS	NA	112 (63.6%)	
Private obstetric care, n (%)		24 (13.0%)	40 (22.7%)	0.01
Maternal BMI, Mean \pm SD		26.65 \pm 4.71	27.1 \pm 5.11	0.30
Induction of labour, n (%)		108 (58.7%)	76 (41.3%)	0.01
Episiotomy, n (%)		40/98 (40.8%)	26/69 (37.9%)	0.09
Gestational age at delivery (weeks)		39.26 \pm 1.29	38.90 \pm 1.08	0.05
Fetal birth weight, grams, Mean \pm SD		3655.14 \pm 451.3	3583.88 \pm 425.1	0.12
Actual mode of delivery, n (%)	Vaginal delivery	94 (51.1%)	58 (33.1%)	0.03
	Instrumental delivery	12 (6.5%)	8 (4.5%)	
	Elective CD	68 (37.0%)	99 (56.6%)	
	In labor CD	10 (5.4%)	10 (5.7%)	
Repeated OASI		5/98 (5.1%)	2/69 (2.9%)	0.28

OASI: Obstetric Anal Sphincter Injuries, NA: Not Available, BMI: Body Mass Index, CD: Cesarean Delivery

Discussion

Our study examined the rate of OASI in subsequent deliveries following an initial OASI over

two distinct equal time periods, demonstrating a non-significant decline in second OASI events, alongside a significant rise in elective CD and private obstetric care usage. These trends reflect evolving obstetric practices, particularly the growing preference for CD worldwide, and specifically after OASI in our cohort. This shift raises important questions about the role of specialised clinics in guiding delivery choices and supporting patient decision-making.

The global increase in CD rates has been described as an epidemic by the International Federation of Gynaecology and Obstetrics (FIGO)^{15,16}. While CD can offer benefits in specific cases, repeated CD carries various short- and long-term risks for both mothers and neonates, including placenta accreta spectrum, uterine rupture, bladder and bowel injury, prolonged procedure time, higher rates of postpartum haemorrhage, and more severe post-operative pain¹⁴. CDs also involve longer recovery times compared to vaginal deliveries and are associated with extended hospital stays, which increase the risk of hospital-acquired infections and impose a greater financial burden on healthcare systems^{17,18}. These factors emphasise the importance of ensuring that CD is chosen for appropriate clinical reasons and not solely driven by patient anxiety or misinformed perceptions. The establishment of specialised perineal clinics is designed to address these issues by providing women with objective, evidence-based information regarding their delivery options after OASI. These clinics facilitate shared decision-making, allowing women to weigh the risks of OASI recurrence against the potential complications of CD, particularly for repeat procedures. The Royal College of Obstetricians and Gynaecologists recommends CD for women with persistent symptoms or objective sphincter defects¹⁰, but the decision to perform a CD must be balanced carefully to avoid unnecessary surgical interventions. In some cases, clinicians may even advocate for vaginal delivery when symptoms are severe at baseline and further deterioration is deemed unlikely, despite the fact that this approach is not necessarily evidence-based.

Interestingly, in our second cohort, 20% of women opted for an elective CD without a clinical recommendation, highlighting the influence of anxiety or previous birth trauma on decision-making^{19,20}. Patient anxiety or birth trauma can play a significant role in shaping delivery choices²⁰, with some women fearing vaginal birth due to past negative experiences rather than an actual risk of OASI recurrence. This fear may explain the rise in private obstetric care observed in our second cohort. Literature indicates that women often perceive private healthcare as safer and of higher quality, especially when managed by a consultant²¹. This perception may contribute to the higher likelihood of CD in privately funded care, with evidence suggesting that patients in private care are twice as likely to opt for a planned pre-labour CD²². Additionally, medico-legal concerns likely influence obstetricians' counseling practices. In the Irish healthcare system, where litigation risks are a significant factor and the

average family size is relatively small, obstetricians may be hesitant to actively encourage vaginal birth after OASI. A defensive approach to obstetric care may therefore contribute to the rising preference for elective CD, even when vaginal delivery remains a reasonable option.

The discrepancy between advised CD and women's actual choices underscores a potential need for comprehensive mental health support and birth debriefing services for women who have experienced OASI. The emotional impact of a traumatic birth may persist regardless of physical recovery, and patient-centered care should involve not only medical management but also psychological support²³. Mental health interventions, such as counselling and debriefing, could help women process their birth experiences and make more informed, evidence-based decisions regarding future deliveries, potentially encouraging vaginal delivery after a previous OASI when appropriate.

Our study showed a significant increase in perineal clinic attendance in the second cohort compared to the first (46.6% vs. 24.5%, $p < 0.01$), though attendance rates remained suboptimal overall. Poor attendance in the first cohort may have resulted in undetected symptoms or sphincter function deficits, which could have influenced the mode of delivery. It is possible that some women who did not attend the clinic in the earlier cohort opted for vaginal delivery despite unrecognised risk factors for OASI recurrence. Nevertheless, the recurrence rates of OASI between the two cohorts did not significantly differ (5.1% vs. 2.9%, $p = 0.28$), which could suggest that improved obstetric care and patient selection have contributed to these lower recurrence rates in both cohorts.

The relatively high episiotomy rates (~40%) in both cohorts likely reflect a more liberal approach to episiotomy after an initial OASI. While mediolateral episiotomy has been shown to reduce the risk of OASI in certain high-risk deliveries, such as instrumental births, its routine use remains controversial²⁴. Improperly performed episiotomies can increase the risk of severe perineal trauma, and individualised clinical judgment is essential when deciding whether to perform one²⁵. Selective episiotomy, based on specific clinical indications, is supported by the literature as the best approach for balancing benefits and risks²⁴.

Our study provides valuable insight into evolving trends in obstetric care following OASI, particularly the role of specialised perineal clinics and the increasing rate of elective CD. The relatively large sample size across two time periods allows for meaningful comparisons and highlights shifts in patient management and outcomes. Additionally, by analysing detailed clinical data from the second cohort, including patient-reported symptoms and follow-up assessments, we offer a comprehensive view of post-OASI care. However, the retrospective

nature of our study introduces potential biases, such as incomplete or missing data. The lack of detailed clinical information from the 2007-2012 cohort limits the comparability of outcomes between the two periods. Moreover, we were unable to fully characterise women who did not attend perineal clinic follow-ups. Additionally, our results may not be generalisable to other populations or healthcare systems with differing obstetric practices.

Our study highlights the increasing trend toward elective CD following OASI and underscores the importance of tailored, patient-centered care. The rise in private obstetric care and patient-driven demand for CD, even in the absence of clinical indications, points to the need for addressing women concerns through shared decision-making and comprehensive counselling. Specialised perineal clinics play a vital role in this process, offering both clinical guidance and emotional support to help women make informed decisions about their delivery options. Further research is needed to explore the long-term outcomes of repeated CDs and to refine strategies for balancing the risks of OASI recurrence with the complications of surgical delivery.

Declarations of Conflicts of Interest:

None declared.

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