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CLINICAL OPINION

Mode of Subsequent Delivery After Obstetric Anal Sphincter Injuries (OASIs)

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Abstract

Introduction and Hypothesis Obstetric anal sphincter injuries (OASIs) are severe perineal lacerations, which have a significant impact on quality of life. The rate of OASIs has been increasing worldwide due to improved awareness, recognition, and reporting. When these women conceive again, they are faced with a dilemma regarding the most appropriate mode of delivery. Although counselling about mode of delivery guides women's decisions, there is a large variation in clinical practice and advice provided to women worldwide. To date, limited literature is available to guide counselling for an optimal mode of delivery of subsequent pregnancy post-OASIs.

Materials and Methods A working subcommittee from the International Urogynaecological Association (IUGA) Innovation, Research, and Development (I, R&D) Committee was created. A literature review was performed to produce a draft, which focused on the recommended mode of subsequent delivery for women with previous OASIs. This document was then evaluated by the entire IUGA I, R&D Committee and revisions were implemented. This review examined the impact of subsequent mode of delivery on pelvic floor functions, overall quality of life, and women's regret regarding their chosen delivery mode. This work represents a narrative review combined with expert opinion, rather than a systematic review or formal guideline.

Results In this opinion paper, the R&D Committee provides guidance regarding the assessment and management of women affected by OASIs and summarises the evidence-based recommendations for the mode of subsequent delivery based on the currently available literature.

Conclusion Postpartum faecal incontinence is multifactorial. A comprehensive assessment by an expert clinician using available resources is recommended to guide an informed decision using a collaborative approach regarding the preferred mode of subsequent delivery post OASIs.

Keywords Obstetric anal sphincter injury (OASI) · Subsequent delivery · Perineal trauma · Fecal incontinence · Recurrence of OASI

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Introduction

Obstetric anal sphincter injuries (OASIs) are defined as a partial or complete disruption of the anal sphincter complex up to the anorectal mucosa. The incidence of OASIs in developed countries ranges between 0.1 and 7% of all vaginal births [1–3]. Numerous risk factors are attributed to OASIs, and can be divided into maternal risk factors (e.g. ethnicity, maternal age, and parity), fetal risk factors (e.g. malpresentation, macrosomia, and shoulder dystocia) and obstetrical risk factors (e.g. operative vaginal deliveries, midline episiotomy, prolonged second stage of labour, previous OASIs, VBAC [4] and induction of labour) [5–11]. Damage to the anal sphincter complex can lead to short and long-term complications, including anal incontinence (AI), defecatory dysfunction, perineal pain, postpartum urinary retention, dyspareunia, and rectovaginal fistula, all of which may negatively impact women's quality of life (QoL) [12–14]. OASIs may also have a significant psychological, social, and economic impact for patients, families, and the healthcare system.

Women with OASIs have an increased risk for recurrent OASIs (rOASIs) in subsequent deliveries [15–18]. The reported rate of rOASIs varies between studies and is dependent on the number of subsequent pregnancies and vaginal deliveries and appears to be influenced by the grade of OASI in the index delivery. A recent meta-analysis that included 15 studies has reported a rate of 1.0–10.7% of rOASIs [16]. This higher risk of recurrence in a subsequent pregnancy may lead to the development or worsening of AI and other associated symptoms.

Owing to a lack of robust evidence, recommendations regarding the mode of delivery (MoD) are lacking. The purpose of this opinion paper was 1: to review currently available literature on postpartum management of OASIs and their impact on pelvic floor dysfunction, and 2: to provide recommendations regarding the mode of subsequent delivery in this patient population.

Materials and Methods

Databases searched included: MEDLINE, EMBASE, and Cochrane Library. Timeframe of search: [2000 to 1 July 2025]. Search terms: including combinations of "OASIS", "anal sphincter injury", "mode of delivery", "subsequent pregnancy", "anal incontinence", "endoanal ultrasound", "manometry".

Inclusion criteria: (1) Studies evaluating outcomes after OASIs. (2) Studies assessing mode of delivery and pelvic floor outcomes. (3) Relevant systematic reviews, cohort studies, and key guidelines.

Exclusion criteria: (1) Case reports and small case series. (2) Non-English publications (if applicable).

Approach to synthesis: Evidence was narratively synthesised and interpreted by the expert panel, with emphasis on clinically relevant outcomes. We have also explicitly stated that the manuscript represents a consensus-based interpretation of available evidence where high-quality data are limited. These additions align the manuscript with recommended standards for narrative reviews while preserving its purpose as a clinically focused expert document.

Postpartum Evaluation of Patients with OASIs

It is recommended that women with a clinical diagnosis of OASI have a postpartum follow-up by an expert clinician in a dedicated clinic [19–22]. Otherwise, these patients require follow-up by an experienced clinician and should be referred for investigations as necessary. The timing of assessments varies amongst dedicated clinics. Postpartum assessment comprises symptom evaluation, physical examination, and investigations, including endoanal ultrasound and anorectal manometry [23]. In settings where anal manometry and sonography are not readily available, management and counselling for women after OASIs is exclusively based on the presence of symptoms and clinical findings. Information gained from these assessments will assist in counselling women regarding the MoD in subsequent pregnancies [24].

Symptom Scores and Questionnaires

A variety of symptom scores and questionnaires may be incorporated into postpartum assessment for anorectal symptoms, pelvic floor function, sexual function and perineal pain, quality of life, mental health, and patient satisfaction. The recommended questionnaires to assess AI symptoms in a clinical setting are the Cleveland Clinic (Jorge and Wexner's) score and the St. Mark's incontinence score (SMS) [25–28]. Both questionnaires are validated for patients with anal incontinence and showed validity and reliability [29]. No dedicated anorectal symptoms tool has been validated in patients with OASIs. However, the correlation between both scores and QoL after OASIs has been addressed [30, 31]. The Faecal Incontinence Quality of Life (FIQL) [5] scale can be used as a complementary tool to symptom questionnaires. Patient symptoms scores may be filed in the medical report to prospectively assess symptom

changes after treatment (e.g. physiotherapy, secondary repair) and during subsequent pregnancies.

Clinical Examination

Physical examination in patients with OASIs consists of general inspection, inspection of the perineum, neurological examination, speculum examination, single digit vaginal examination, bimanual examination, and rectovaginal examination. During inspection, it is important to examine for scarring, hypoestrogenism, presence of soiling, gaping anus, perineal body length, and to rule out presence of rectovaginal fistula [20, 21]. It is also important to perform digital rectal examination (DRE) and pelvic floor muscle test. To perform DRE, a pill-rolling motion is used between the index finger in the rectum and the thumb over the anal sphincter to palpate for a gap in the anal sphincter, which may be present with an anal sphincter defect. Anal sphincter tone at rest, voluntary contraction during pelvic floor muscle activation, sustained contraction for 5 s and involuntary contraction evoked by a cough can be appreciated and rated as strong, normal, weak, or absent [20, 21, 32]. It is important to note that DRE has a sensitivity of 12–82% and specificity of 32–55% for detecting residual anal sphincter defects after primary OASI repair. Therefore, the use of DRE alone to diagnose residual anal sphincter defects is not recommended and imaging should be obtained to assess the integrity of anal sphincter complex [33–36].

Assessment of Structure of Anal Sphincter Complex

Endoanal Ultrasound (EAUS) Imaging of the anal sphincter complex has advanced from bi-dimensional (2D) endoanal ultrasound (EAUS) in the early 1990 s [37, 38] to three-dimensional (3D) acquisitions [39, 40] and endocoil magnetic resonance [41, 42]. To date, EAUS is the gold standard for assessment of the structure of anal sphincter complex and detection of residual anal sphincter defects after birth [32, 43, 44]. EAUS is performed with a cylindrical 10 MHz transducer placed in the anal canal giving a detailed 360° acquisition of the anal sphincter complex [45]. At ultrasound, the sphincter muscles can be clearly discriminated owing to their different reflectivity: the internal anal sphincter (IAS) is hypoechoic, whereas the external anal sphincter (EAS) is hyperechoic [31, 32, 46]. When a 2D equipment is used, the probe is progressively withdrawn through the anal canal to visualise the puborectalis muscle, the deep EAS, the superficial EAS and the subcutaneous EAS. As the anal sphincter is shorter anteriorly in the female, defects are best not diagnosed at the deep level [43]. When the EAS defect is visualised in proximal and distal levels, particularly if it is of full thickness, it is defined as a significant defect [47]. In contrast, 3D EAUS allows volume acquisition, and the extent of the EAS defect can be quantified. The accepted cutoff for the length of defect is around 50% of the sphincter length [48, 49], whereas the cutoff for radial defect is 30° (corresponding to 1 h on a 12 h-clock) [50], or less commonly 90° (one quadrant) [51, 52]. Moreover, both 2D and 3D EAUS allow the detection of IAS defects.

In the past decades, EAUS has improved the detection and the correct classification of sphincter injuries [32, 41]. Currently, EAUS is the recommended imaging modality in women after OASI, and it has been shown to be helpful in counselling patients on subsequent childbirth [24, 53, 54].

Neither pregnancy nor delivery by caesarean section (CS) have been shown to modify sphincter morphology [55]. Conversely, vaginal delivery even in the absence of an OASI has been associated with a decrease in anal resting tone and squeeze pressures [56]. In parous women the sphincter is thinned anteriorly and thickened laterally in the distal anal canal, whereas in the proximal and mid canal there is significant thickening [24]. Therefore, it has been hypothesised that childbirth-related changes in sphincter function are likely to be due to mechanical trauma to the anal canal at birth rather than to hormonal changes during pregnancy [57–59].

EAUS is typically performed after 6 weeks postpartum since early postpartum assessment has poor correlation with long-term anal incontinence and may be misinterpreted as defects due to artefacts arising from edema, haematoma, and sutures. However, defects present at 3 months, are permanent and further sonographic changes are caused only by subsequent childbirth [58, 59].

Transperinal Ultrasound To date, most prospective studies on OASI and subsequent births have utilised EAUS to evaluate sphincter repair and the presence of residual defects [60]. However, EAUS equipment may not be readily available at most obstetric units and gynaecologists may resort to three-dimensional transperineal ultrasound (3D-TPUS) and two-dimensional transperineal ultrasound (2D-TPUS), also known as introital ultrasound, to screen for the presence of residual anal sphincter defects in women with clinical diagnosis of OASI [61–63].

Van de Vlist et al. conducted a retrospective study using transperineal ultrasound to assess women giving birth after OASI. The authors considered residual sphincter defect and puborectalis defects as risk factors for symptoms after subsequent birth [64].

It is important to acknowledge that transperineal ultrasound has diagnostic limitations in women with OASIs. Unlike EAUS, transperineal ultrasound has not been validated with histology [38]; therefore, its utility in the

assessment and management of women after OASIs await further confirmation. Some authors compared transperineal and EAUS in women after childbirth and they found strong agreement in assessing residual obstetric anal sphincter defects [65, 66]. Similar to EAUS, early transperineal assessment after OASI performs sub-optimally when compared to transperineal sonography at 3 months postpartum [67]. Some authors claimed that perineal ultrasound has a high negative predictive value, but low positive predictive value for residual sphincter defects when compared to EAUS [68]. Therefore, transperineal ultrasound may have a role as a screening tool for anal sphincter integrity and residual defects, but EAUS remains the most accurate imaging modality to diagnose and manage anal sphincter defects. Recently, Okeahialam et al. compared the cutoff of 30° for radial defects at transperineal scan with EAUS and they concluded that the optimal cutoff angle for significant defects at transperineal ultrasound requires further research to improve agreement with EAUS [69].

Transperineal ultrasound does have some advantages. Firstly, perineal ultrasound is widely available in every gynaecology unit [21], less expensive and less invasive than EAUS, and better tolerated by women after birth [68, 70]. In addition, it may detect other postpartum pelvic floor alteration, i.e. bladder neck descent and funnelling, post void residual, puborectalis avulsion and ballooning, which have clinical relevance in women after OASI [21].

Women may experience anorectal symptoms after OASI. Correlation between symptoms and EAUS findings was found to be weak at 8–12 weeks postpartum [71]. However, EAUS findings had the strongest association with AI symptoms 2 years after OASIs [72].

This variation highlights the importance of EAUS in the postpartum assessment to counsel women regarding the MoD, rather than relying on symptoms alone.

Assessment of Function of Anal Sphincter Complex/ Anorectal Manometry

When evaluating anorectal function, reliance solely on clinical symptoms is not recommended, as they are limited and relatively non-specific. Research has shown that incorporating diagnostic tests significantly enhances accuracy and helps guide treatment decisions for patients with anorectal symptoms [73–76]. Thus, clinical history and examination should be complemented by physiology tests (i.e. anorectal manometry).

While mechanical disruption of the anal sphincter muscle fibres as seen on ultrasound is certainly an important parameter to be assessed [77], traumatic births also result in varying degrees of nerve and connective tissue damage. Consequently, imaging alone may not detect significant functional impairments [78]. Anorectal manometry (AM) is a well-established and widely used diagnostic test that has long been recognised as superior to digital examination for assessing anorectal pressures. Despite challenges in interpretation due to lack of standardisation, it provides valuable data on anal sphincter function, anorectal reflex activity, rectal sensation, and compliance [79].

Multiple studies have demonstrated that OASIs may impact anorectal pressures [42, 80, 81]. Chaliha et al. demonstrated that in women with isolated external sphincter defects, the maximum squeeze pressures were significantly lower than those in women with intact sphincters; and in women with combined external and internal sphincter defects, both the resting and squeeze pressures were significantly lower than those in women with intact sphincters. The authors also showed instrumental delivery to be an independent risk factor for decreased sphincter pressures [80].

Reduction in anal squeeze pressures may show recovery with time. A prospective study conducted by Cornes et al. found an improvement in anal squeeze pressures at 6 months postpartum compared to the immediate postnatal period [82]. Taithongchai et al. discussed the issue of transient neuropraxia when they compared parameters between missed OASIs and primarily repaired OASIs in women 8 to 12 weeks postpartum. Although there was a significant increase in anal incontinence symptoms and size of sphincter defects, no difference in manometry was demonstrated [83]. However, a manometric study performed 12 weeks after delivery in women with rOASI showed worse anal sphincter function when compared to women who had sustained only one OASI, suggesting a cumulative effect of the injury and possible worsening of symptoms in the long-term [59].

While manometric findings have been shown to correlate with sphincter imaging, they often do not correlate with patient reported symptoms, particularly in cases of mild AI [84–87]. This may reflect the multifactorial pathophysiology of AI as well as the limitations of anorectal investigations. Therefore, test results should always be interpreted in the context of the clinical scenario to ensure a comprehensive evaluation of the continence system, guide treatment planning, and support patient counseling.

Badri et al. have shown that compromised anal sphincter function would be captured with AM and EAUS together rather than EAUS alone, and almost one third of asymptomatic women would not have been identified without AM assessment. It was concluded that AM should be performed in all women with OASI alongside EAUS to enable accurate counselling for future MoD [88]

Social, Psychological, and Emotional Impact of OASIs

OASIs can have a significant psychological impact on patients' lives, including feelings of anxiety, depression, shame, and social isolation [89]. Altered body image was reported in 53% of women with OASI [90]. Emotional morbidity can have a negative impact on breastfeeding, maternal–infant bonding and relationship, and infant development. Women may be reluctant to seek care and there is no specific screening tool to assess emotional recovery post-OASIs [91].

It is common for women with OASIs to experience anxiety and depression and 93% of women with AI report difficulty coping. Sixty-four percent of women with AI experienced fear of incontinence during intercourse, and 12% never resumed intercourse. Women reported that OASIs affected relationship with their partner. Partners of women with OASIs reported anxiety and isolation as well, highlighting the importance of involving and supporting the partners [92].

Although there was no significant difference in QoL at 46 months postpartum for women who did and did not have a subsequent vaginal delivery (VD) post-OASIs, women may find OASIs to be a traumatic experience and 49% of women with faecal incontinence reported anxiety about subsequent delivery [93]. Therefore, it is important to provide trauma-informed care for these women and advocate to policy makers for mental health programmes.

Impact of OASIs on Pelvic Floor Dysfunction

Anorectal Symptoms

The presence of OASI is a major risk factor for the development of anorectal symptoms and 15–61% (mean 39%) of women after primary OASI repair report AI during their lifetime [94, 95].

Anorectal symptoms include faecal urgency, faecal incontinence, and flatal incontinence. The severity of AI symptoms increases with the severity of perineal injury. Operative VD is recognised as the strongest risk factor for the development of anorectal symptoms. The incidence of AI is highest in the puerperal period and decreases as the pelvic floor musculature function recovers postpartum [52, 60]. Permanent AI has been reported in 34.6% of women with OASIs and even mild anorectal symptoms can significantly impact QoL [96, 97]. Severity of anorectal symptoms can worsen as the anal sphincter function deteriorates with age and women who are initially asymptomatic may become symptomatic with time [52]. A 2014 prospective cohort study revealed that 10% of women who were asymptomatic at 9 weeks postpartum, developed de novo AI after 3 years due to persistent anal sphincter defects [98]. This highlights the importance of EAUS for detection of residual anal sphincter defects and counselling regarding the possibility of developing anorectal symptoms in the future.

Multifactorial Nature of Anorectal Symptoms

Although the presence of OASI and the size of residual anal sphincter defect are important risk factors for the development of anorectal symptoms, faecal incontinence is multifactorial and has been reported in 17% of all women in the first year postpartum [99].

Women with an intact anal sphincter complex or adequate primary repair may also experience anorectal symptoms due to weakness in the pelvic floor musculature. These may result from pregnancy itself, prolonged second stage, fetal macrosomia, operative VD, or denervation of the pudendal nerve [100, 101]. This highlights the importance of EAUS to assess the integrity of anal sphincter complex to detect the presence of residual anal sphincter defects. This also emphasises the importance of AM to evaluate and document the function of the anal sphincter both for clinical evaluation and as a basis for future comparisons.

Rectovaginal Fistula

OASI is the most common cause of rectovaginal fistula. Rectovaginal fistula has been reported in 1–3% and 8.2% of women after primary repair and secondary repair, respectively [102]. Risk factors for fistula formation include missed fourth-degree and buttonhole tears, inadequate primary repair, wound infection and dehiscence, and secondary repair of a fourth-degree tear [59].

Urinary Symptoms

Postpartum Urinary Retention has been reported in 33–41% of women with OASIs; this may be due to perineal pain and delay in normal return of bladder sensation after regional anesthesia. Therefore, it is recommended to adopt bladder protocol as per local guidelines for monitoring and identification of urinary retention post OASI [102, 103].

Urinary Incontinence is common and has been reported in 33.3–72% of women post-OASI [104, 105]. In a prospective cohort study of 435 women, 16% reported stress urinary incontinence, 15% urgency, and 20% urinary frequency at 3 months postpartum [106]. Twenty-seven percent of women with OASIs reported combined anal and urinary incontinence [60]. Development of urinary symptoms post-OASIs has been associated with use of rotational forceps, prolonged second stage of labour, and persistent fetal occiput posterior position [107].

Perineal Wound Complications

Wound complications are common in women with OASIs. The overall incidence of wound infection is 4.4% (range 0.1–19.8%) and wound dehiscence is 6.9% (range 1.9–24.6%) in women after primary repair of OASIs and both may occur concurrently [107]. Evidence is lacking regarding the incidence of wound complications for subsequent delivery post-OASI. Perineal wound complications can prolong recovery and result in sexual dysfunction, perineal pain, dyspareunia, AI, rectovaginal fistula formation, defecatory dysfunction, and hospital readmission. They can also negatively affect body image, relationships with newborn and family, and impact quality of life. Reoperation is required in 1.2–2.6% of women with OASIs and early secondary repair within 14 days postpartum is a feasible option in these women [108, 109].

Perineal Pain and Sexual Dysfunction

Postpartum perineal pain, dyspareunia, and sexual dysfunction are common short- and long-term sequelae in women with OASIs. Acute perineal pain is the most common symptom that may be due to edema, bruising, and wound complications [110]. It has been reported in 100% on day one, 91% on day seven, and 20% at 6 weeks postpartum in women with OASIs. It can affect maternal and infant bonding and predispose to urinary retention, sexual dysfunction, defecatory dysfunction, postpartum depression, and social isolation [111].

The presence of OASI is a strong predictor for postponed coital resumption postpartum and 57–75.2% of women with OASIs resume intercourse at 3 months postpartum, with an incidence of dyspareunia of 51–64% at this time point. Sexual dysfunction is multifactorial and has been associated with dyspareunia, lack of desire, decreased lubrication, fear of incontinence or pain, hypoestrogenic state secondary to breastfeeding, perineal wound complications and fear of wound disruption, postpartum depression, levator avulsion, and presence of residual anal sphincter defects [112–117].

There is no significant difference in pain severity between overlapping and end-to-end repair techniques at 12 months postpartum [118]. Chronic perineal pain and dyspareunia has been reported in 10–53% of women with OASIs [110, 114]; this emphasises the importance of screening for perineal pain and sexual dysfunction in women post-OASIs [116].

Mode of Delivery Following OASI

Influencing Factors

All women with a previous OASI should be counselled regarding the mode of subsequent delivery, and this discussion should be documented. A collaborative approach and shared decision-making are important. The MoD in a pregnancy following an OASI is influenced by various factors, with patients' choice being a primary consideration [104].

Of note, patients' reasons for choosing to have an elective CS in a future pregnancy is often unrelated to the prevalence of faecal incontinence but related to other types of pelvic floor dysfunction (PFD), including sexual dysfunction [119] and urinary symptoms [120]. The presence of OASI does not necessarily have a greater impact on these factors than a VD would. Interestingly, other factors unrelated to PFD also contribute to the decision to undergo an elective CS, such as ethnicity, with white Caucasian women more likely to choose an elective CS, increasing maternal age as well as women who have had an operative VD or more severe grades of OASI. One study demonstrated that the presence of fourth degree tears was the single greatest predictor of an elective CS [121]. Some of these could be due to counselling in favour of an elective CS, particularly when a woman has had a previous high-grade OASI [18].

A recent meta analysis concluded that pregnant women with previous one OASI have a fivefold increased risk of recurrent OASI, with an increase risk of anal incontinence after a second OASI; [122, 123]. However the risk of new onset AI or worsening of it is not associated with the mode of delivery of the second pregnancy. These increased risks should be included in counselling women with previous OASI to allow them to make an informed decision regarding mode of second labour [123].

Impact on Pelvic Floor Dysfunction

A French observational study assessed PFD following VD after an index OASI [93]. The prevalence of perineal pain, stress incontinence, bowel dysfunction, pelvic organ prolapse, sexual dysfunction, and overall QoL related to PFD was similar in those after another VD versus those who had no further deliveries.

In an Australian retrospective cohort of all OASI cases at a tertiary teaching hospital, ongoing faecal or flatal incontinence was reported by 12% of women. There was no statistically significant difference in St Mark's incontinence scores

between those having a VD and those with a CS ($p=0.59$) [124]. This raises the question whether a subsequent CS is protective.

In another nested case controlled study looking at women who had a subsequent VD with no OASI compared to those who had a rOASI, the incidence of anorectal symptoms was similar. However, the anal sphincter function was significantly worse in the latter group indicating the possibility of long-term problems in later life [59].

In the largest study assessing the impact of subsequent MoD after an OASI on bowel function and related quality of life [97], there was no significant change in frequency of bowel symptoms or QoL domains in women who had a subsequent VD compared to those with a CS. Interestingly, this study showed that the odds of poor QoL for the domains of incontinence impact and physical impact on the Manchester Health Questionnaire was actually greater in women who had a CS. This was further substantiated in a systematic review by this group which failed to show a significant association between AI or a diminished QoL in women who delivered vaginally compared with those who delivered by CS in a subsequent pregnancy [97].

Pelvic floor dysfunction, including AI secondary to OASIS, is a known complication of vaginal birth. Women have the right to be aware of such risks during pregnancy as well as encouraging antenatal education to cover the long term sequelae of childbirth effecting the pelvic floor to allow women to make an informed decision whenever needed before or during labour. As we cannot prevent birth injuries, we can at least prevent misinformation about pelvic floor complications postpartum [125, 126].

Prevention of rOASI

There is no difference in strategies in preventing rOASI compared to primary OASI, both have similar risk factors and therefore the same recommendations should be followed [125]. The largest prospective study of primiparous women who sustained OASI reported an observation that a prophylactic mediolateral episiotomy reduced rOASI by 80% [127].

Regret Regarding Mode of Subsequent Delivery

Edwards et al. assessed decisional regret with subsequent route of delivery following an OASI [104]. Half of all women who had a VD in a subsequent pregnancy were likely to have no regret; however, 36% had mild regret and 10% had moderate to severe regret about their choice. Regret was more likely to be associated with older age and prevalence of faecal incontinence after delivery. Women who underwent an elective CS, were less likely to feel regret about their chosen MoD.

Areas of Future Research

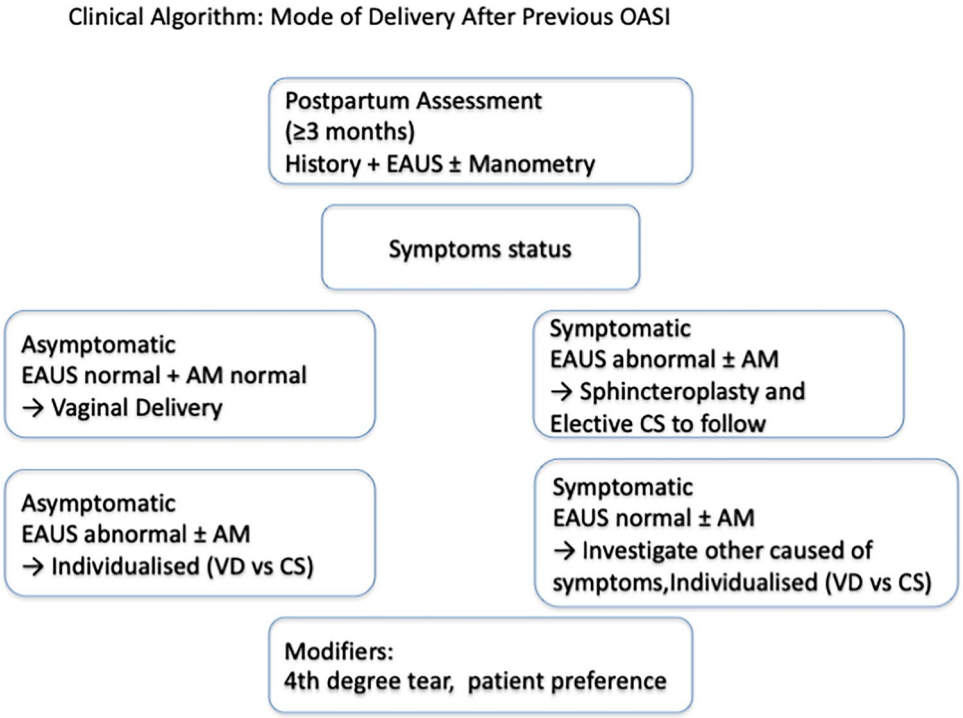
Future research regarding MoD post-OASIs is required for the following reasons:

- Currently available small sized studies that are inadequately powered, most of which are retrospective cohort studies.
- Use of various patient relevant outcome measures (PROM) makes it difficult to compare outcomes from different studies.
- Lack of baseline PFD record before and after the index delivery in which OASIs occurred.
- Lack of endoanal physiology data to assess the impact of future delivery on the status of the anal sphincter.
- Lack of understanding of the proportion of symptoms that are a consequence of the VD versus the actual parturition.
- Lack of a properly designed RCT of mode of delivery after acute OASIs

Summary of Descision-Making for Mode of Delivery Post OASI

We have developed and included a new original clinical decision-making algorithm, this algorithm is based on the evidence synthesis and expert consensus presented in the paper and includes: (1) Symptom status: (asymptomatic or symptomatic:anal incontinence, QoL impact). (2) Structural assessment: EAUS findings (normal vs residual defect; extent of defect). (3)Functional assessment: anorectal manometry (normal vs reduced pressures), where available. (4) Risk considerations: previous OASI severity, obstetric risk factors for recurrence. (5) Clinical recommendation: vaginal delivery in low-risk profiles, Consideration of caesarean section in women with significant symptoms and/or abnormal investigations after corrective sphincteroplasty when necessary. (6) Emphasis on shared decision-making.

These are summarized in the figure below which provides a self-contained, clinically applicable framework aligned with the aims of an IUGA R&D Committee document.



Conclusion

Approximately half of all women who sustained an OASI go on to have another delivery [51]. A significant proportion (1 in 5) opt for an elective CS [128] in the hope of protecting their pelvic floor. However, current evidence does not support the notion that subsequent CS provides such protection. It is therefore, concerning that women may be being exposed to the unnecessary risks of an invasive procedure.

There is a dire need for further research to inform clinicians and patients regarding the impact of future deliveries on PFD. In addition, the lack of robust evidence limits the ability of healthcare providers to offer proper counselling to these women.

To address these gaps, well powered, multicentre and internationally coordinated studies are essential to determine the most appropriate MoD for women with a history of OASI.

Recommendations of Management Following an OASI

1. Women affected by OASI should be followed-up in a dedicated clinic, where detailed history, examination, assessment including EAUS and AM are performed. They should have access to high-quality information about the risks and benefits of both vaginal and cesarean delivery and should have the opportunity to discuss their concerns and preferences with their healthcare provider.
2. Well informed decision-making is important, and specific MoD is based on clinical assessment, including EAUS and AM findings, psychological impact of OASIs, current symptoms, previous corrective surgery for faecal incontinence, healthcare provider experience, and patient's wish to avoid possible rOASIs and de novo or worsening anorectal symptoms. Ultimately, the decision should be made collaboratively between the patient and their healthcare provider to ensure the best possible outcome for both mother and baby.
3. Subsequent VD must be performed by a clinician in a hospital setting, with a low threshold to perform a CS if the risk factors for rOASIs are present [20].
4. Asymptomatic women with residual anal-sphincter defect or transient faecal incontinence after their first VD are at high risk of faecal incontinence after a second VD [45]. This emphasises the importance of detailed postpartum assessment, including EAUS (gold standard tool), to quantify the integrity of the anal sphincter complex regardless of the presence of postpartum AI symptoms.
5. Since postpartum AI is multifactorial, elective CS will not completely protect against anorectal symptoms.

6. Following a protocol to manage OASI and formulate a plan for future MoD is highly recommended.
7. In women opting for a VD following a previous OASI, precautions to prevent recurrence such as adopting the OASI care bundle should be considered, and delivery should take place in a well-equipped centre [129].
8. Research is needed to investigate the optimal MoD in women with previous OASIs based on long-term consequences.
9. With variation in resources across the globe, an international guideline to manage OASIs is much needed to assist healthcare providers worldwide in managing this group of patients, towards a better outcome for the immediate postpartum period and reduce subsequent morbidity later in life.

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Declarations

Conflict of interest None.

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