**Aims of Workshop**

The best management of OASIS is a multidisciplinary approach. This workshop will not only evaluate the most up-to-date evidence regarding the incidence, pathophysiology, clinical diagnosis, anorectal investigations, short term and long term bowel dysfunction and the conservative management following OASIS repair but will also provide guidance for evidence-based shared decision making regarding subsequent mode of delivery after OASIS. It is also an opportunity to raise awareness of bowel dysfunction in a society that predominantly focuses on urinary incontinence following birth trauma.

**Learning Objectives**

**Aims:**
This workshop aims to familiarise delegates with the mechanisms of OASIS, the management of associated bowel dysfunction, and provide guidance for evidence-based shared decision-making regarding subsequent mode of delivery after OASIS.

**Objectives:**
At the end of the workshop the participants should be able to:
1. Understand the anatomy and physiology of the pelvic floor including the anal sphincter complex.
2. Recognise and classify OASIS following endoanal ultrasound assessment.
3. Understand anorectal physiology following OASIS.
4. Identify and evaluate bowel dysfunction following OASIS.
5. Understand the management of lower bowel dysfunction following OASIS.
6. Understand the long-term consequences of OASIS.
7. Identify preventative measures of OASIS.
8. Identify interventions to reduce the risk of recurrent injury and associated harms.
9. Understand the process of decision-making about subsequent mode of delivery.

**Learning Outcomes**
At the end of the workshop the participants should be able to:
Understand the anatomy and physiology of the pelvic floor including the anal sphincter complex.
Understand the effect of delivery on pelvic floor and sphincter trauma.
Recognise and classify OASIS.
Understand anorectal physiology and endoanal ultrasound following OASIS and when to use it.
Identify bowel dysfunction following OASIS in both short and long-term and understand the management of lower bowel dysfunction following OASIS.
Identify preventative measures of OASIS.
Understand the process of decision-making about subsequent mode of delivery.

**Suggested Learning before Workshop Attendance**


| Speaker 1 (Alexis Schizas) | **Introduction to the Workshop**
|----------------------------|----------------------------------|
|                            | **Anorectal anatomy, physiology and evaluation following OASIS**
|                            | An understanding of normal anatomy and physiology is essential to then identify changes and injury following OASIS. Assessment first is performed clinically and then appropriate physiology and imaging can be performed.
|                            | **Clinical Assessment**
|                            | Digital rectal examination can identify sphincter injury and weakness. We can also identify other common pathology following OASIS such as rectocoele, intussusception and scarring or shortening of the perineum.
|                            | **Anorectal Physiology**
|                            | The function of the anal canal and rectum is assessed by a catheter and includes rest and squeeze anal pressures; vectograms; first, urge and maximal sensation; rectal compliance and balloon evacuation. There is conflicting evidence on the association of rectal compliance with obstructive defaecation. Some demonstrate normal compliance and sensation in all subjects (with/without a rectocele) whilst others show reduced rectal compliance and impaired sensation.
|                            | **Integrated Total Pelvic Floor Ultrasound (endoanal, transvaginal, transperineal)**
|                            | Endoanal, transvaginal and transperineal ultrasound are routinely used for anterior and middle compartmental assessment and the integrity of the anal sphincters. Its’ use in the assessment of the anal sphincters, enterocele, rectocele and intussusception.
|                            | Endoanal ultrasound assesses the integrity of the internal and external sphincters and associated defects, sepsis, and is the gold standard for assessing obstetric trauma.
|                            | Transperineal ultrasound is more likely than defaecation Proctography to make multiple diagnoses. It has a high positive predictive value and low negative predictive value for abnormalities compared to defaecation Proctography. It may provide a suitable screening tool for symptomatic patients though there remains insufficient evidence to adopt this as routine practice.
|                            | **Defaecation Proctography**
|                            | Defaecation Proctography is a dynamic investigation of rectal emptying involving the voluntary expulsion of barium paste recorded on cineradiography or fluororadiography. It is regarded as gold standard for the morphological assessment of posterior compartment pelvic floor disorders with the advantages of assessing defaecatory dynamics. It provides structural and functional assessment of; rectocele, intussusception, rectal prolapse, enterocele, sigmoidocoele, perineal descent and the anorectal angle along with anismus and evacuation.

**Take home message:**
- An understanding of normal anatomy and physiology and what to expect post OASIS
- Knowledge of the appropriate investigations for bowel dysfunction following OASIS

**Speaker 2 (Rufus Cartwright)**

**Incidence of OASIS**

Demographic shifts towards higher maternal BMI, larger birth weight, and lower parity have increased risks for OASIS, but in most countries the incidence of OASIS has risen even faster than expected, with increased awareness and diagnosis. This talk will review definitions for perineal trauma, assess the evidence for trends in incidence of OASIS and consider in detail the risk factors for OASIS. We will explore the efforts being made internationally to reduce the incidence of OASIS, and consider whether it is possible antenatally to identify women at risk from OASIS for primary prevention.

**Speaker 3 (Heidi Brown)**

**Bowel dysfunction following OASIS**

Obstetric anal sphincter injuries (OASIS) are associated with increased risk of both short-term and long-term bowel symptoms. The range of bowel symptoms may include fecal incontinence (involuntary loss of feces – solid or liquid), anal incontinence (involuntary loss of feces or flatus), fecal urgency (sudden, compelling desire to defecate that is difficult to defer), diminished rectal sensation, feeling of incomplete evacuation (complaint that the rectum does not feel empty after defecation), and more.

Bowel symptoms occur most commonly following OASIS in the setting of operative vaginal delivery (OVD), likely related to global pelvic floor damage in addition to damage to the sphincter complex specifically. The risk of bowel symptoms after OASIS is higher in the setting of other comorbidities, such as abnormal stool consistency and increased age. While OASIS is strongly associated with short-term bowel symptoms, its role is less consistently demonstrated in long-term follow-up.

In the first 3–6 months following OASIS, reported rates of fecal incontinence range from 4–10%, while up to 30% of women may experience anal incontinence and fecal urgency. Within 5–10 years following OASIS, the risk of anal incontinence is two-fold higher than among women who have not experienced OASIS, with reported prevalence rates between 20 and 60%.

**Cesarean delivery following OASIS**

While there are no prospective trials to address this question, both the Royal College of Obstetricians and Gynaecologists (RCOG) and the American College of Obstetricians and Gynecologists (ACOG) suggest that all patients be counselled about the option of Cesarean delivery following OASIS. While the absolute risk of repeat OASI is low, women with a prior OASI are at increased risk for subsequent OASI. Despite this increased risk, the majority of women with prior OASIS deliver vaginally in subsequent pregnancies. Women with a prior OASI who do not have bowel symptoms or abnormalities on anal manometry or endoanal ultrasound may be good candidates for subsequent vaginal delivery. The algorithm used by Professors Ranee Thakar and Abdul Sultan at Croydon Health Services (https://www.perineum.net/documents/Management%20OASIS%20in%20pregnancy-092325.pdf) recommends that those who already have evidence of functional or anatomic compromise on anal manometry or endoanal ultrasound should be offered Cesarean section. ACOG states, based on expert opinion, that women with a history of OASI should be offered a cesarean delivery if she 1) experienced anal incontinence after the delivery; 2) had complications including wound infection or a need for a repeat laceration repair; or 3) expresses suffering psychological trauma and requests a scheduled cesarean delivery. The low risk of repeat OASI must be balanced against the
known morbidity of Cesarean delivery, taking into account the patient’s long-term family planning goals along with the risks of repeat cesarean delivery.

**Take home message:**
- Bowel symptoms are common after OASIS and may increase in the long term
- Patients should be counselled regarding a cesarean section following OASIS based on the previous degree of injury, bowel symptoms, previous medical complications following OASIS and psychological symptoms

<table>
<thead>
<tr>
<th>Speaker 4 (Paula Igualada-Martinez)</th>
<th>Conservative management of OASIS-related bowel dysfunction and preventative interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conservative management is often considered as the first line approach for AI following OASIS due to its safe, effective and non-invasive nature. It has been recommended by the National Institute for Clinical Excellence (NICE), the International Continence Society and The Royal College of Surgeons. Conservative management includes advice on bowel retraining and lifestyle interventions such as the recommendation of a diet that promotes an ideal stool consistency and predictable bowel emptying and techniques such as transanal irrigation to facilitate bowel evacuation.</td>
</tr>
<tr>
<td></td>
<td>Conservative management also includes electromyographic (EMG) biofeedback, neuromuscular electrical stimulation (NMES) and in particular, pelvic floor muscle training (PFMT). PFMT aims to increase strength/power (the maximum force produced by a muscle in a single contraction), endurance (ability to contract repetitively and to maintain the muscle contraction over a period of time), and synchronize muscle activity (such as the pre-contraction of pelvic floor muscles including the external anal sphincter previous to a rise in intraabdominal pressure, or to repress urge).</td>
</tr>
<tr>
<td></td>
<td>PFMT has a Level-A evidence rating and has been recommended as first line prevention and treatment of urinary incontinence (UI) in the adult female population. It is hypothesized the PFMT may also be effective in treating AI in the postpartum population and is routinely advocated as first line management of AI. Johannessen et al (2017) suggested that an individualised PFMT programme might reduce symptoms of AI including patients with OASIS.</td>
</tr>
<tr>
<td></td>
<td>A recent systematic review evaluated the benefits of PFMT and biofeedback on anal incontinence following OASIS. The authors advocate PFMT to this patient group in order to improve function and quality of life and recommend that future research should evaluate the intervention in well-designed studies.</td>
</tr>
<tr>
<td></td>
<td>The antenatal interventions utilised as a preventative measure includes perineal massage and pelvic floor exercises.</td>
</tr>
<tr>
<td></td>
<td><strong>Take home message:</strong></td>
</tr>
<tr>
<td></td>
<td>- All women should be offered conservative management following OASIS</td>
</tr>
<tr>
<td></td>
<td>- Conservative management should be the first line management of OASIS related bowel dysfunction</td>
</tr>
</tbody>
</table>

**Suggested Reading**


Obstetric Anal Sphincter Injury: An Introduction

Rufus Cartwright

Department of Urogynaecology, Oxford University Hospitals NHS Trust, UK
No relevant financial conflicts of interest

Aims
- Review definitions for perineal trauma
- Assess trends in incidence of OASIS
- Consider in detail the risk factors for OASIS

Grading of Perineal Trauma

1 - Skin only
2 - Perineal muscles
3a - <50% of EAS
3b - >50% of EAS
3c - EAS & IAS
Grading of Perineal Trauma

1. Skin only
2. Perineal muscles
   3a. <50% of EAS
   3b. >50% of EAS
   3c. EAS & IAS
3. Rectal mucosa

Grading of Perineal Trauma

1. Skin only
2. Perineal muscles
   3a. <50% of EAS
   3b. >50% of EAS
   3c. EAS & IAS
3. Rectal mucosa

Buttonhole

Classification of Episiotomy

1. Median / midline
2. Modified median
3. J shaped
4. Mediolateral
5. Lateral
6. Radical lateral
7. Anterior

Sultan, 1999; ICI, 2004; RCOG, 2004

Kalis et al, BJOG 2012

Incidence

“True” incidence of OASIS is 11% - 35.4% using endoanal ultrasound
Williams et al, 2001; Sultan et al, 1993
98.8% of injuries can be detected at the time of delivery without ultrasound
Andrews et al, 2006
The overall incidence is increasing

Rates of recognised injury vary widely
- between countries 0.4% (Italy) - 9.2% (Sweden)
  Prager et al, 2008
- between hospitals 1.3% - 4.7% (Norway)
  Valbe et al, 2008
Impossible to directly compare different studies, because of acquisition bias
Midwives miss 87% of injuries, doctors miss 28%
Andrews et al, 2006
Changing incidence or changing recognition?

Kudish et al, 2008; Laine et al, 2009; Raisanen et al, 2009

Unmeasured Confounding

- As OASIS has increased in Finland, use of episiotomy has decreased
- The measured association has reversed in direction!
- Caution about unmeasured confounding in observational studies

Raisanen et al, BMJ Open 2013

The “Established” Risk Factors

- Forceps or ventouse
- Nulliparity
- Birthweight
- Maternal age
- Identified as major risk factors – little inconsistency in literature


Episiotomy and OASIS – The RCTs

<table>
<thead>
<tr>
<th>Author</th>
<th>Year Type</th>
<th>RR (95% CI)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harrison</td>
<td>1994</td>
<td>Mediolateral</td>
<td>0.09</td>
</tr>
<tr>
<td>Sleep</td>
<td>1994</td>
<td>Mediolateral</td>
<td>0.04</td>
</tr>
<tr>
<td>House</td>
<td>1996</td>
<td>Mediolateral</td>
<td>0.11</td>
</tr>
<tr>
<td>Koul</td>
<td>1992</td>
<td>Moltine</td>
<td>1.03</td>
</tr>
<tr>
<td>Harrison 1992</td>
<td>Mediolateral</td>
<td>0.63 (0.67, 1.42)</td>
<td>15.86</td>
</tr>
<tr>
<td>Argentina 1993</td>
<td>Mediolateral</td>
<td>0.78 (0.45, 1.34)</td>
<td>16.31</td>
</tr>
<tr>
<td>Ekersey</td>
<td>1994</td>
<td>Mediolateral</td>
<td>1.06</td>
</tr>
<tr>
<td>Darnicki 2004</td>
<td>Mediolateral</td>
<td>0.40 (0.10, 1.24)</td>
<td>0.34</td>
</tr>
<tr>
<td>Juste-Pina 2007</td>
<td>Mediolateral</td>
<td>1.01 (0.86, 1.20)</td>
<td>0.21</td>
</tr>
<tr>
<td>Murphy 2008</td>
<td>Mediolateral</td>
<td>1.26 (0.97, 1.67)</td>
<td>0.91</td>
</tr>
<tr>
<td>Rodriguez 2008</td>
<td>Moltine</td>
<td>0.47 (0.38, 0.58)</td>
<td>0.37</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>(I-squared = 14.6%, p = 0.303)</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Mirza et al, ICS 2013

Guro-Urgaci et al, 2013

Marschalek et al, Birth 2018
Perineal Length and Episiotomy Angle

- Angle of mediolateral episiotomy is significantly narrower in women who sustain OASIS
- Perineal length is significantly shorter in women who sustain tears, and OASIS (after adjustment for birthweight)
  Risk et al, 2000; Dua et al 2009; Stendedt, 2013

Familial Risk

Suggests genetic factors
- Must be acting both on maternal and fetal causal pathways
- But could there be unmeasured confounding?
  Baghestan et al, BJOG 2013

Prior caesarean and OASIS

VBAC associated with OR 1.42 for OASIS
- Even after “maximal” adjustment
- What are these unmeasured factors?

Risk of Asian Ethnicity

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Country</th>
<th>n</th>
<th>Adjusted OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eleus et al</td>
<td>2008</td>
<td>Sweden</td>
<td>365,886</td>
<td>1.51</td>
</tr>
<tr>
<td>Dahlen et al</td>
<td>2007</td>
<td>Australia</td>
<td>6,595</td>
<td>1.83</td>
</tr>
<tr>
<td>Hopkins et al</td>
<td>2005</td>
<td>USA</td>
<td>17,216</td>
<td>1.41</td>
</tr>
<tr>
<td>Goldberg et al</td>
<td>2003</td>
<td>USA</td>
<td>34,048</td>
<td>2.01</td>
</tr>
</tbody>
</table>

• Asian women may be at increased risk of obstetric anal sphincter injury compared to Caucasian women
• Only data from Asia reports absolute risk of just 0.3–1.7%
  Nolte et al, 2006; Wat et al, 2015

Smoking and OASIS

- Smoking is strongly protective (aOR 0.72)
- Effect is only apparent for women with big babies
- Other more important reasons not to smoke during pregnancy!

Socioeconomic Status

High socioeconomic status women at increased risk of OASIS
- May reflect “better” care
  Raisanen et al, PLoSONE 2013
Conclusions

- OASIS is common – and getting more common
- Major risk factors are nulliparity, birthweight, maternal age and use of forceps
- Strong observed effects of
  - current smoking
  - SES
  - Prior CS
  - Asian ethnicity
- Clearly unexplained causal mechanisms that deserve attention
- Focus should be on population-wide measures to prevent OASIS
  - Prediction remains impossible
  - Many risk factors are not modifiable
Anorectal Anatomy and Physiology following OASIS

Alexis Schizas
Guy’s and St Thomas’ Hospital

Affiliations to disclose†:
Nil

Funding for speaker to attend:
- Self-funded
- Institution (non-industry) funded
- Sponsored by:

Normal Ano-Rectal Anatomy
- Levator ani
- Perineum
- Sphincters

Perineal Muscles
- Bulbospongiosus
- Transverse Perinei
- Puboanalis
- Perineal Body
- Anal Sphincters

Bulbospongiosus

Transverse perinei
**Perineal Muscles**

- Bulbospongiosus
- Transverse perinei
- Puboanalis

**Perineal body**

**External anal sphincter**

**Internal anal sphincter**

**Internal Anal Sphincter**

- Extension of the circular muscle layer of the rectum
- Constant maximal contraction
- 50-85% of resting anal tone
- Autonomic innervation
  - Parasympathetic: S2-4
  - Sympathetic: thoracolumbar ganglia (T15)

**External Anal Sphincter**

- Multiple layers of striated muscle
- Voluntary contractions to prevent fecal leak
- 25-30% of resting anal tone
- Somatic innervation from the inferior rectal branch of the pudendal nerve (S2-3) and the perineal branch of S4
Normal Anal Canal Anatomy on AES

- The basic 4 layer pattern
  - subepithelium
  - internal anal sphincter
  - longitudinal muscle
  - external anal sphincter

External anal Sphincter
Longitudinal muscle
Subepithelium
Internal anal sphincter

Resting pressure
- Internal anal sphincter function.

Squeeze pressure
- External anal sphincter function.
- Puborectalis

Anal Manometry

Obstetric Anal Sphincter Injury (OASIS) Clinical Classification

1st Degree
- Injury to the perineal skin only

2nd Degree
- Injury to the perineum extending into the perineal muscles but not the anal sphincters.

3rd Degree
- Injury to the perineum involving the anal sphincter complex
  - 3a: Less than 50% of the external anal sphincter (EAS) thickness torn.
  - 3b: More than 50% of EAS thickness torn.
  - 3c: Both EAS and internal anal sphincter (IAS) torn.

4th Degree
- Disruption of the anal sphincter complex (EAS and IAS) and anal epithelium.

Women

Men

Study

Station pull-through

Slow pull-through

Rapid pull-through

Read et al. Gastroenterology, 1979; 76:747-756
Scarring to Right Transverse Perinei

Overlapping Sphincter Repair

The two ends of the external sphincter are marked with yellow and green arrows.

Internal and External Sphincter Defect

External sphincter defect between 11 and 2 o'clock and internal sphincter defect between 10 and 3 o'clock.
OASIS on AES

• Positive correlation between the extent of sphincter defect and the degree of anal incontinence following primary repair
• External sphincter trauma was associated with
  • a significant decrease in squeeze pressure
  • an increase in incontinence score
• Internal anal sphincter injury associated with
  • decreased anal physiology
  • significantly related to faecal incontinence.
• Tears to the puboanalis or transverse perineii only do not affect pressure or incontinence scores.

Anal Manometry

• Caesarean section
  • No change in anal pressure
• Vaginal delivery
  • Fall in rest and squeeze pressure
• Instrumental delivery
  • Further decrease in squeeze
  • Reduction in pressure is greatest after a third or fourth degree tear
  • Decrease in anal canal symmetry

Summary

• Severity of OASIS correlates with symptoms and physiology
• AES used to assess injury
• Faecal continence and defaecatory disorders
  • Multi-factorial aetiology
  • Internal sphincter and perianal
  • Internal anal sphincter
  • Rectal resistance
  • Puborectalis and anal angle between rectum and anal canal
  • Recto-rectal inhibitory reflex
  • Anal cushion
  • Stool volume and consistency
What is “bowel dysfunction?”

OASI + “?”

Pubmed hits:
- Fecal incontinence: 321
- Anal incontinence: 147
- Faecal incontinence: 64
- Constipation: 8
- Defecatory dysfunction: 1

Anal incontinence after OASIS

Anal incontinence is prevalent after OASIS in the immediate post-partum period, in the short-term, and in the long-term.

<table>
<thead>
<tr>
<th>Country</th>
<th>Author</th>
<th>Follow-up</th>
<th>n</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>Marsh</td>
<td>3 mos</td>
<td>435</td>
<td>25%</td>
</tr>
<tr>
<td>Sweden</td>
<td>Wegnellus</td>
<td>6 mos</td>
<td>134</td>
<td>31%</td>
</tr>
<tr>
<td>Norway</td>
<td>Laine</td>
<td>10 mos</td>
<td>591</td>
<td>21%</td>
</tr>
<tr>
<td>Norway</td>
<td>Johamnnessen</td>
<td>12 mos</td>
<td>1030</td>
<td>19%</td>
</tr>
<tr>
<td>Sweden</td>
<td>Wegnellus</td>
<td>3-8 years</td>
<td>134</td>
<td>49%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Visscher</td>
<td>5 years</td>
<td>66</td>
<td>63%</td>
</tr>
<tr>
<td>Denmark</td>
<td>Janglo 2018</td>
<td>11 years</td>
<td>2008</td>
<td>41 – 59%</td>
</tr>
<tr>
<td>Denmark</td>
<td>Soerensen</td>
<td>22 years</td>
<td>125</td>
<td>35%</td>
</tr>
<tr>
<td>Germany</td>
<td>Huebner</td>
<td>27 years</td>
<td>99</td>
<td>39%</td>
</tr>
</tbody>
</table>

AI after OASIS varies within individuals.

- 3 – 6 mos PP: 31% AI
- 3 – 8 years PP: 49% AI


AI symptoms worsen with time p/ OASIS

Retrospective case-control study (surveys in 1996 & 2005)
- 171 women s/p OASIS repair (1971-1990)
- 171 parity- and delivery-date-matched controls

Response rate: 61% to both questionnaires

Anorectal complaints:
- 1996: 38% of case versus 16% of controls
- 2005: 61% of cases versus 22% of controls

In contrast to the control group, the increase of anorectal complaints in the case group between 1996 and 2005 was highly significant (P < .0001)

OASIS increases odds of anal incontinence.

Systematic review & meta-analysis of association between perineal trauma (OASIS / episiotomy) and AI
Searched PubMed, Ovid (MEDLINE), Cochrane Trials, Cumulative Index to Nursing and Allied Health Literature (CINAHL)
12/16 studies (N=2288) evaluated OASIS & AI → meta inclusion for meta-analysis

OR 2.66 (95% CI 1.77-3.98)
Q = 27.9; P = .002; I² = 64.1

LaCrosse, J Midwifery Womens Health, 2015 Jan-Feb;60(1):37-47

Fecal incontinence after OASIS

Fecal incontinence is more prevalent in the immediate post-partum period, in the short-term, and in the long-term.

Within 1 year: OR 1.90 (0.92-3.95)
At 10 years: AOR 2.49 (1.73 - 3.56)
At 20 years: AOR 1.84 (1.40 – 2.43)

Brown, Obstet Gynecol 2012; Jango 2018; Soerensen, Dis Col Rect 2013

QOL impact may be worse

90 women with OASIS compared to 320 women who underwent VB and 527 women who underwent CS

Evers, AJOG 2012

OASIS & other bowel symptoms

• Fecal urgency
• Difficulty with defecation
• Fecal incontinence with intercourse

Degree of injury & quality of repair matter.

Prospective study of 531 women s/p primary OASIS repair
Mean follow-up 9 (SD, 5.9) weeks after delivery
Compared to women with 3a – 3b, women with 3c – 4:
• Worse defecatory symptoms & more impaired QoL
• More impaired QoL
• Abnormal ARM findings
• Residual defect on EAUS (IAS alone or IAS & EAS)
Combined IAS & EAS defect •
• Incontinence of liquid stool
• Lower anal canal pressures

Anomalies on sonography and ARM

Persistent sphincter defect is often correlated with symptoms, especially if defect involves both IAS and EAS
• Combined IAS and EAS OASI → worse FI & lower anal pressures than women with isolated EAS 5 years after delivery (Visscher, IUJ 2014)
• Shorter anterior EAS length in cases with severe FI years after OASIS imaged by both EAUS and MRI (Sorensen, Dis Col Rect 2013)

Recurrent OASI is very bad for bowel symptoms

N = 1490 women s/p vaginal delivery after a first delivery with OASIS
106 had recurrent OASI
50.0% (n = 53) AI versus 37.9% (n = 525) without recurrent OASIS
23.6% (n=25) FI versus 13.2% (n = 183) without recurrent OASIS
34.9% (n=37) QOL impact versus 24.2% (n = 355)
Controlling for degree of OASIS in first delivery, maternal age, birthweights, years since first and second delivery, and AI prior to second pregnancy:

AI with recurrent OASI: AOR 1.68 (1.05-2.70), P = .03
FI with recurrent OASI: AOR 1.98 (1.13-3.47), P = .02

OASIS is not good for anal continence.

Etiology of bowel dysfunction after OASIS is multifactorial

OASIS is not the only culprit!

Vaginal delivery → AI

NP=787 (19%) CS = 389 (10%) VP = 2927 (71%)
POP 4% (32/774) 4% (16/386) 8%** (233/2883)
SUI 8% (64/771) 11% (43/387) 18%** (101/588)
OAB 9% (70/773) 9% (36/381) 15%** (427/2853)
AI 19% (143/766) 16% (60/383) 28%** (786/2883)
PFD 27% (201/750) 27% (98/369) 42%** (1150/2767)

*p < 0.05 VP compared to CS AND NP

Lukacz ES, IUJ 2005 (KP CARES survey N=4,000)
### OVD → AI

<table>
<thead>
<tr>
<th>Method</th>
<th>All Blood Delivery</th>
<th>Before Blood Delivery</th>
<th>Caesarean Delivery</th>
<th>OVD</th>
<th>SVD</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR</td>
<td>1 (ref)</td>
<td>1.07 (1.02-1.13)</td>
<td>1.63 (1.55-1.71)</td>
<td>1.52 (1.45-1.59)</td>
<td>2.10 (1.92-2.30)</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>1 (ref)</td>
<td>1.12 (1.05-1.19)</td>
<td>1.48 (1.40-1.56)</td>
<td>1.62 (1.54-1.70)</td>
<td>2.22 (2.13-2.32)</td>
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</table>

Table 1: Relative Odds for Each Pelvic Floor Disorder 5-10 Years From First Delivery by Obstetric Exposure

**Note:** OVD > SVD > C-section → AI

### OVD > SVD > C-section → AI

**Prevalence of AI:**

- **OVD > SVD > C-section**

**Systematic review**

Does the mode of delivery predispose women to anal incontinence in the first year postpartum? A comparative systematic review

**Handa, Obstet Gynecol 2011**

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**Bowel dysfunction 3 mos after OASIS**

**Patients with OASIS & OVD at highest risk!**

- **Fecal urgency:**
  - 41% FCP, 30% SVD/VAVD (p=0.04)
- **Incomplete bowel emptying:**
  - 43% FCP, 28% SVD (p=0.03)
- **Highest rates of bowel symptoms in patients with rotational forceps compared to all others**
  - Fecal Urgency: 61% vs. 32% (p = 0.001)
  - Fecal Incontinence: 9% vs. 3% (p = 0.1)


---

**OASIS in the setting of OVD → more AI**

- **Prospective cohort of 268 women with OASIS in early postpartum period**
  - 194 OVD (91% FAVD, 9% VAVD)
  - 74 SVD
  - At 1 week: OASIS p/OVD → AI & higher FISI score
  - Also more pain and UI
  - No differences @ 12 weeks


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**PPM strength plays a role in symptoms**

**Prospective cohort of 95 women with OASIS evaluated 6 mos postpartum (Spain, Italy, Poland)**

- How do residual AS defect & PFM strength → AI?

**Gorra, Int Urogynecol J. 2017 Mar;28(3):455**

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**OASIS & interaction with bowel symptoms**

**Objective:** To ID OB risk factors associated with FI in women with irritable bowel syndrome (IBS)

**Methods:** 115/164 (70%) of women in parent study about IBS completed interview about bowel symptoms and OB history

**Results:**

- FI associated with: parity, OVD, OASIS, fecal urgency, diarrhea, & hysterectomy (NOT with episiotomy, POP, or UI)
  - Interaction between OASIS and bowel symptoms amplified risk of FI
  - OASIS + diarrhea → more than doubled risk of FI
  - OASIS + fecal urgency → increased the risk of FI by nearly 2-fold

**OASIS data was by patient report, so concern about recall bias**

**Robinson, FPMRS 2013**
OASIS matters, but so do other things

"It says here that you’d prefer someone with regular bowel incontinence. Does it matter if they’re dyspareunia?"

References for tables

Brown, Obstet Gynecol 2012
Huebner, Intl J Gynecol Obstet 2013
Johannessen, BJOG, 2014
LaCross, J Midwifery Womens Health. 2015 Jan-Feb;60(1):37-47
Soerensen, Dis Col Rect 2013
Visscher, Int Urogynecol J 2014
Conservative Management of OASIS-related bowel dysfunction and preventative interventions

By Paula Igualada-Martinez
Clinical Specialist Physiotherapist
Physiotherapy Department - Pelvic Floor Unit
Guy's and St Thomas' NHS Foundation Trust
London, UK

Conservative Management of OASIS related bowel dysfunction

"Women should be advised that physiotherapy following repair of OASIS could be beneficial."


Conservative Management of OASIS related bowel dysfunction: Goals

- To change stool consistency
- To promote and complete effective defecation
- To strengthen the Pelvic Floor Muscles including EAS
- To normalise the sensibility of rectum

Acute physiotherapy management

- R.I.C.E
  Rest, Ice, Compression and Elevation
- Avoidance of excessive forces on healing tissue (Defecation dynamics and constipation management)
  Bø et al (2007) Evidence-Based Physical Therapy for the Pelvic Floor
  Acute physiotherapy management • Pelvic Floor Muscle Training (PFMT) (pain-free activation!)
  NICE (2006). Routine postnatal care of women and their babies
  NICE (2006). Routine postnatal care of women and their babies
- Raise awareness of common symptoms following OASIS

Funding for speaker to attend:
- Self-funded
- Institution (non-industry) funded
- Sponsored by:

Paula Igualada-Martinez

Affiliations to disclose:

Coloplast Ltd
(Continence Advisory Board-Product Development)
From 6-12 weeks onwards

Initial clinical assessment:
- History taking
- Observation and Physical examination
- Outcome measures

Primary Interventions

Secondary Interventions

Bliss et al (2017) 6th International Consultation on Incontinence

Primary Interventions

1. Good defecation dynamics
2. Glycerine Suppositories

What about stool consistency?

- Bowel diary
- Avoidance of known triggers
- Two RCT's to show that psyllium is effective in reducing AI compared with Loperamide and has less side effects
- Liquid Loperamide a better option as reduces the risk of constipation
- Avoid codeine if breastfeeding

Secondary Interventions

- PFMT (B)
- PFMT + Rectal Balloon Training (A)
- Electromyographic (EMG) Biofeedback (B)
  - Home device preferable
- Neuromuscular Electrical Stimulation (B)
- Incontinence products such as an anal plug or insert (B)
- Transanal Irrigation (C)

Pelvic floor muscle training

- PFMT: training consists of repetitive and maximal voluntary contractions and relaxations of the PFM's and external anal sphincter
- Exercise programs should follow the principles of:
  - Specificity, Overload, Progression and Maintenance
- For a minimum of 5 months
- Include strategies to adhere to the exercise regime
- Endurance of squeeze

Bliss et al (2017) 6th International Consultation on Incontinence
There is evidence that BFB and NMES may enhance the outcome of treatment compared to NMES alone or exercises alone.

Biofeedback therapy and sphincter exercises may have a therapeutic effect.

ASSESSMENT AND CONSERVATIVE MANAGEMENT OF FECAL INCONTINENCE AND QUALITY OF LIFE IN ADULTS

PFMT is recommended as an early intervention in the treatment of AI, as part of a conservative management bundle of interventions, based upon low cost, low morbidity, and at least weak evidence of efficacy (Grade A).

Biofeedback, which is usually combined with PFMT and sensory training with a rectal balloon, is recommended as second-line treatment for AI after other behavioral and conservative/medical management have been tried and have failed to provide adequate symptom relief (Grade A).

The studies included in this systematic review had different interventions, length of treatment, outcome measures: unable to draw conclusions about the effectiveness of physiotherapy in women following OASIS, HOWEVER the authors still recommend offering treatment to this group of patients.
Secondary Interventions

Preventative conservative measures

- Pelvic floor muscle training

Anal Plugs, pads and TAI

Conclusions

- Conservative management has **NO ADVERSE EFFECTS:**
  - It should be first line management of anal incontinence!

- Prevention is better than cure

- Ensure good communication with the MDT!

- We should aim for a standardization of protocols and equipment
  - "There is marked variation in practice, training and supervision of BFB therapists in the UK"


**Thank you for listening!**
DEBATE: THE MOTION

THE BEST MODE OF DELIVERY FOLLOWING PRIOR OASI IS VAGINAL.
For: RC  Against: HB

- Women may experience recurrence of OASIS
  - But at similar rates to first-time mothers
  - And AI outcomes following adequately repaired OASIS are good
- Women may experience worsening or new onset anal incontinence
  - But this may occur regardless of mode of delivery
  - For asymptomatic women the largest series reports no change in anal incontinence symptoms after vaginal delivery (n=99)
- We can identify women at higher risk of recurrent OASIS
  - But both the absolute risk increase and the population attributable risk fraction remains very small
  - For a large majority of women a vaginal delivery is a safe option for their bowel function
Conclusions

- The absolute risks of recurrent OASIS or anal incontinence are small after vaginal delivery
- There is no evidence that caesarean protects against anal incontinence
- There is ample evidence that caesarean has harms for both mother and baby
We should never presume to make a strong recommendation for or against caesarean after OASIS.

We should trust that women are able to make a decision that fits with their values and preferences...once they understand the risks and benefits.

DEBATE: AGAINST THE MOTION

THE BEST MODE OF DELIVERY FOLLOWING PRIOR OASI IS NOT VAGINAL.

Pregnancy is magical...

OASI is not.

Compression & ischemia are part of the physiologic parturition process.

And the risk of recurrence is high.

3 – 13% recurrent OASI
Even if you don’t have another OASI, even 10% symptom deterioration.

Risk of symptom deterioration

In a cohort of 1978 women with prior OASI, AI worsened after vaginal delivery and improved after C-section.

<table>
<thead>
<tr>
<th>Vaginal Delivery</th>
<th>Elective C-section</th>
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<tbody>
<tr>
<td>N = 1472</td>
<td>N = 506</td>
</tr>
<tr>
<td>Before 2nd delivery</td>
<td>29.4%</td>
</tr>
<tr>
<td>After 2nd delivery</td>
<td>38.9%</td>
</tr>
<tr>
<td>Change in AI</td>
<td>+9.5%</td>
</tr>
</tbody>
</table>


What do gynecologists say?

Mail survey of 234/973 (24%) Dutch gynecologists


WHY WAIT?

If she already has FI, more than 75% recommend C-section!

WHY RISK IT?

If her prior OASI was 3c or 4, majority recommend C-section.

WHY RISK IT?

Why risk it?

Pregnancy is magical...

AI is not.

Should we use imaging to guide us?


GREAT PLAN!
REBUTTAL: FOR THE MOTION

THE BEST MODE OF DELIVERY FOLLOWING PRIOR OASI IS VAGINAL.

Disadvantages

Primum non nocere

Caesarean has clear harms – and the benefits in this setting are entirely unproven

REBUTTAL: AGAINST THE MOTION

THE BEST MODE OF DELIVERY FOLLOWING PRIOR OASI IS NOT VAGINAL.

The risk of placenta previa in the subsequent pregnancy after CS delivery is lower than previously estimated. Given the placenta previa rate in England and the adjusted effect of previous CS, 359 deliveries by CS would result in one additional case of placenta previa in the next pregnancy.

The data are limited.

Only 2 women would have to deliver by CS to prevent 1 woman from having a pelvic floor disorder.
ClinicalTrials.gov NCT00632567

Recruitment Status: Completed
First Posted: March 10, 2008
Last Update Posted: December 15, 2016

Study Type: Interventional (Clinical Trial)
Actual Enrollment: 554 participants
Allocation: Randomized
Intervention Model: Parallel Assignment
Masking: None (Open Label)
Primary Purpose: Prevention
Official Title: Anal Incontinence After Delivery. Secondary Prevention With Caesarean Section.

Study Start Date: March 2008
Actual Primary Completion Date: March 2016
Actual Study Completion Date: April 2016

First Posted: March 10, 2008
Last Update Posted: December 15, 2016

What People Don’t Tell You About Childbirth: The Realities of Vaginal Tearing

https://www.cosmopolitan.com/health-fitness/a22517294/what-is-vaginal-tearing-childbirth/