IGNITE

PELVICON 2024

Pre-Con 2024

Birth Injuries & Risks: Navigating Complex Birth Decisions

Taryn Hallam

PRE-CON ‘24

Taryn Hallam, PT

Taryn is a physiotherapist with advanced specialization in urogynecology and a two-time PelviCon speaker

Taryn teaches advanced coursework and has trained more physical therapists in pessary use for incontinence and pelvic organ prolapse than anyone else in the world.

She graduated from the University of Sydney in 2000 with a Bachelor Applied Science (Physiotherapy).

Women’s Health Training Associates (WHTA)

Taryn educates physios from around the world through the WHTA. You can find her info at

www.whta-members.com

Birth Injuries & Risks:
Navigating Complex Birth Decisions

PELVICON 2024 - PRE-CON!

BIRTH INJURIES AND RISKS

Navigating Complex Birth Decisions

Taryn Hallam
Women's Health Training Associates

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No Financial

INTRODUCTION

There is no doubt that all around the world, decisions around 'BIRTH OPTIONS' is a very controversial area of health care, and one that is continuing to be **increasingly political….** with **increasing legal ramifications / requirements.**

1. Midwifery Care vs Obstetric Care

2. Location

Hospital Birth
vs
Birth Centre
vs
Homebirth

3. Mode of Birth

3.1 Birth Choice: Vaginal vs Caesarean
Should a woman be able to choose?

3.2 Is possible risk of Pelvic Floor Dysfunction a justifiable consideration in making that choice?

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INTRODUCTION

There is no doubt that all around the world, decisions around 'BIRTH OPTIONS' is a very controversial area of health care, and one that is continuing to be **increasingly political….** with **increasing legal ramifications / requirements.**

LITTLE NOTE

The benefit of a 'pre-con' is that it allows a lot more time for discussion.

Can I please encourage you all to actively participate ….

This is a complex topic, not just clinically but also ethically

Being prepared to respectfully hear each other's thoughts / views / opinions is vital and yes, we **all** (including me) have our own biases…
these are important to think about

A very **complex** and **multifactorial** debate

3.2 Is possible risk of Pelvic Floor Dysfunction a justifiable consideration in making that choice?

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INTRODUCTION

There is no doubt that all around the world, decisions around 'BIRTH OPTIONS' is a very controversial area of health care, and one that is continuing to be **increasingly political….** with **increasing legal ramifications / requirements.**

THREE PARTS TO THIS PRE-CON!

1st hr: LEGAL ASPECTS

What are the **increasing expectations** on health care providers **to inform** pregnant patients of possible risks and complications associated with vaginal birth?

2nd hr: PF Trauma 1st BIRTH

Can we determine antenatally which women are at risk of **significant pelvic floor trauma** in a first birth?
What are the options if we do identify these women?

3rd hr: PF Trauma 2nd BIRTH AFTER OASI

What advice can we give to women who are deciding between vaginal birth vs elective c-section after a first birth which incurred an anal sphincter injury

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QUESTION

How many of you are aware of the case –

"Montgomery vs Lanarkshire Health Board'?

Note: whilst based in Scotland, it has probably become one of the most famous legal obstetric cases internationally in the last 20 years, regularly discussed at International OBGYN conferences

FYI….this case has significantly changed the discussions in obstetric care regarding legal requirements and **consideration of women's rights to their own informed decision-making regarding birth choices**

Montgomery vs Lanarkshire Health Board (Scotland)

INITIAL BACKGROUND TO THE CASE

In Oct 1999, Ms Nadine Montgomery gave birth to 'Sam Montgomery' in a hospital in Scotland.

Prior to labour it was known that Nadine was a **type 1 diabetic, of short stature and explicitly expressed concern in the latter stages of her pregnancy about carrying a 'big baby'.**

ANSWER

because these are known risk factors for Shoulder Dystocia

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Shoulder Dystocia

But it is so rare Obgyn would never suggest everyone be subjected to c-section 'just in case' this happens

An obstetric emergency reported as occurring in only 0.6 – 0.7% of vaginal deliveries

 anterior fetal shoulder becomes impacted on the maternal pubic symphysis such that **normal gentle traction of fetal head does not result in delivery** ('turtle sign)'

POSSIBLE IMPACTS ON BABY

Massive!

- Diaphragmatic Paralysis
- Fracture of clavicle or humerus
- Hypoxic Ischemic Encephalopathy
- Brachial Plexus Injury
- Fascial Nerve Injuries
- **Fetal Death**

… and choosing elective c-section completely removes the chance

The head is out but the body is in!!

MANAGEMENT OPTIONS – EMERGENCY!!!

1st Line: • Mc Robert's Manouvre (knees to chest) • Suprapubic Pressure

2nd Line: • ?episiotomy followed by Rubin, Woods, or alternate rotational procedure

Last resort intentional clavicular fracture, maternal symphysiotomy etc

1. Hill A, Lense J, Roepcke F 2020. Shoulder Dystocia: Managing an Obstetric Emergency. Am Fam Physician 2020: 102(2): 84 - 90

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Shoulder Dystocia

An obstetric emergency reported as occurring in only 0.6 – 0.7% of vaginal deliveries

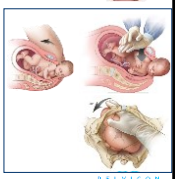
 anterior fetal shoulder becomes impacted on the maternal pubic symphysis such that **gentle traction of fetal head does not result in delivery** ('turtle sign)'

What about risks for the mother?? (that no-one seems to ever talk about)

Unfortunately, there are also risks to the mother…

A lot of the risks (but admittedly not all)

simply come from the emergency procedures needed to save the baby



2020. Shoulder Dystocia: Managing an Obstetric Emergency. Am Fam Physician 2020: 102(2): 84 - 90

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Shoulder Dystocia

An obstetric emergency reported as occurring in only 0.6 – 0.7% of vaginal deliveries

 anterior fetal shoulder becomes impacted on the maternal pubic symphysis such that **gentle traction of fetal head does not result in delivery** ('turtle sign)'

POSSIBLE RISKS TO MOTHER

- Uterine rupture
- Haemorrhage
- Pelvic Floor!!: Laceration to **bladder, urethra, vagina, anal sphincter** and rectum, and ??possible **increased risk of Levator Ani Avulsion**
  - note: no *specific research* on avulsion after shoulder dystocia, however…
- Symphyseal rupture with pelvic instability
- Lateral Femoral Cutaneous Neuropathy

?Relevant Avulsion Research: Takmaz et al 2021

Found that application of fundal pressure during 2nd stage significantly increased the risk of LAM defect

OR = 5.63 95%CI 2.01 – 15.74, p = 0.001

Note: I have only **once** seen a woman after a SD who didn't have an avulsion

1. Hill A, Lense J, Roepcke F 2020. Shoulder Dystocia: Managing an Obstetric Emergency. Am Fam Physician 2020: 102(2): 84 - 90

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Shoulder Dystocia

It is a question of antenatal choice / informed consent…
Elective C-Section completely eliminates risk of Shoulder Dystocia
So should a woman be allowed to choose elective C-Section?

An obstetric emergency reported as occurring in only 0.6 – 0.7% of vaginal deliveries

 anterior fetal shoulder becomes impacted on the maternal pubic symphysis such that **gentle traction of fetal head does not result in delivery** ('turtle sign)'

!!! NOTE !!!
Shoulder Dystocia is a VERY BIG DEAL
It is an emergency situation that midwives/OBGYNs drea

If it occurs….survival of the baby is the priority

This discussion is NOT suggesting that procedures needed to manage shoulder dystocia should not performed due to the risk of injury to the mother…
BABY'S SURVIVAL IS PRIORITY AT THIS MOMENT!

So what is the point of this discussion?

?Relevant Avulsion Research: Takmaz et al 2021

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LET'S DO A POLL!!

An obstetric emergency reported as occurring in **only 0.6 – 0.7% of vaginal deliveries**

THE QUESTION WE ARE REALLY ASKING IS….

When is the risk 'significant enough' that a woman should be advised of the risk?

Sutherland 2021[2] states that 'a risk is material' if a *reasonable person* in the patient's position would be likely to attach significance to it

But also, that the ***likelihood of the risk occurring*** **is distinct from the *gravity of the risk*** and that a practitioner must disclose a risk where

1. the incidence of the risk is high, or
2. where the incidence is low but the gravity of the risk is high / serious.[p2008]

This might suggest women should be told of the possibility??

But can Obgyn's really discuss every possible complication with every woman??

There is also an added consideration though….

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THINKPOINT

POPULATION RISK vs INDIVIDUAL RISK

It tends to be common practice that pregnant women are given 'total population incidence' to infer their risk of a complication (eg risk of shoulder dystocia is 0.6% or <1 in 150 births)

BUT…. SHOULD WE REALLY USE TOTAL POPULATION INCIDENCE DATA TO INFORM ??

AVERAGE POPULATION RISK data is simply the overall rate for an ENTIRE population / cohort

An individual's risk may be higher or lower than the average, depending on their own individual characteristics, which means population data may not reflect the woman's actual risk

Note…. we don't use 'total population' incidence in most other areas of healthcare.

Example: an anesthetist assessing the risk of a general anesthetic for surgery

in a 24yo healthy male vs an 82yo hypertensive male with COPD

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Known Risks for Shoulder Dystocia (SD)

1. Diabetes in pregnancy: long been known to be a significant risk factor for SD.

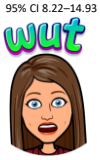
Persson et al 2009[3] found that whilst shoulder dystocia occurred in only **0.2% of infants born to mothers without diabetes**, it occurred in **13.7% of infants delivered by Type 1 diabetic mothers** (a 1 in 7.5 chance)

aOR = 11.08 95% CI 8.22–14.93 ($p < 0.001$)

NOTE re STATISTICS

Whilst the risk in women with diabetes is very high, the reality is that only a very small percentage of women have diabetes.

Therefore, the average risk for the total population becomes skewed down to 0.6-0.7%



QUESTION

Is it ok to simply tell a Type 1 Diabetic Mother that the risk of shoulder dystocia in vaginal birth is only 0.6 – 0.7% of all births?

But it gets worse...

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Known Risks for Shoulder Dystocia (SD)

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aOR = 11.08 95% CI 8.22–14.93 ($p < 0.001$)

2. **Fetal macrosomia:** is also known to be a major risk factor for SD (the larger the baby above 4000g the higher the risk of shoulder dystocia)

Abdelwahab et al 2023[4] found that the risk is so high when the baby is >4500g, that the NNT (by caesarean section) to prevent 1 shoulder dystocia was:

NNT = 8	**NNT = 6**
in non-diabetic women carrying a fetus > 4,500g	in diabetic women (all types) carrying a fetus > 4,500g

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Just FYI....

Let's look specifically at some USA Data

Shoulder Dystocia in the United States[5]

Research across the USA indicates the rate of shoulder dystocia varies from **~0.2 – 3.0%**

However this data is skewed by: RATES OF MACROSOMIA IN USA:

only 7.8% of births >4000g

ie 92.2% are not macrosomic; <4000g

Therefore data on 'rate of shoulder dystocia' is largely reflective birth with babies <4000g

SUB-ANALYSIS: SHOULDER DYSTOCIA RATES IN THE USA IN SPECIFIC SUB-COHORTS

- The rate of SD in births with a **fetus >4500g** is **9 – 14%**
- The rate of SD in births with a **fetus >4500g and a mother who is diabetic** is **20 - 50%**

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Shoulder Dystocia in the United States[5]

REMEMBER

They can't predict Should Dystocia till it happens and…

- there is then significant risk to the baby
- there is also significant risk to the mother

Should Diabetic Women with a suspected Macrosomic Baby have the choice of an elective C-Section or induction of labor early?

SUB-ANALYSIS: SHOULDER DYSTOCIA RATES IN THE USA IN SPECIFIC SUB-COHORTS

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Which brings us back to the relevance of the

Montgomery vs Lanarkshire Health Board Legal Case

Montgomery vs Lanarkshire Health Board (Scotland)

In 1999, Ms Nadine Montgomery was a woman of short stature with **type 1 diabetes and pregnant.**

In the later stages of pregnancy she explicitly expressed concern she was carrying a 'big baby', and worried whether she might be unable to deliver her baby safely.

Little note: Sam was tracking large for gestational age and ultimately weighed 9lb 6oz (4.25kg)

This means that she probably had an estimated 15-20% possibility of shoulder dystocia?

Who thinks her OBGYN should have discussed with her the possibility of shoulder dystocia?

Montgomery vs Lanarkshire Health Board (Scotland)

In 1999, Ms Nadine Montgomery was a woman of short stature with **type 1 diabetes and pregnant.**

In the later stages of pregnancy she explicitly expressed concern she was carrying a 'big baby', and worried whether she might be unable to deliver her baby safely.

Despite this, Nadine was simply reassured by her OBGYN that vaginal delivery (VD) was the appropriate form of childbirth, and:

- She was NEVER advised of any risks to her of proceeding with a vaginal delivery
- She was NEVER advised of the possibility of shoulder dystocia.
- She was NEVER offered the option of a caesarean section.

It is important to take note of this

In fact, when this later went to court, her own Obgyn and 4 other specialists testified that

'if they were to mention the 9-10% risk of shoulder dystocia in diabetics, most if not all diabetics would ask for a caesarean section, and therefore they do not usually disclose the risk'.

THOUGHTS?

So what happened in the birth?

Montgomery vs Lanarkshire Health Board (Scotland)

BIRTH

Sam was 9lb 6oz / 4.25kg (and remember, being born to a 5ft tall diabetic mother)

Shoulder dystocia occurred resulting in birth of baby Sam's head but not shoulders for **12 minutes**

- Nadine ultimately required an extended episiotomy **and symphysiotomy** for birth of Sam's Body
- was born 'stillborn'
- however CPR and adrenalin restored his heartbeat

- needed 6 weeks special care on a ventilator
- suffered a brachial plexus injury / Erb's Palsy, trauma to his face, head and neck with multiple subdural haematomas, and hypoxic encephalopathy
- ultimately diagnosed with **cerebral palsy**

again …. Thoughts??

(remembering that being a diabetic mother of short stature and likely big baby her risk could have been predicted as > 20%)

Montgomery vs Lanarkshire Health Board (Scotland)

Quotes from Nadine about her Pregnancy, Birth and subsequent follow up:

from website: https://laurensutherlandqc-lawandethics.com/guest-author/nadine-and-sams-story/

*My last scan at 38 weeks was cancelled by my consultant as **she felt the increasing size of my baby was fueling my anxiety**. To be honest I think she was simply fed up with me constantly asking about the size of the baby. As it turned out, I had every reason to be anxious.*

Months later, after my long recovery I wanted to understand more about Sam's tragic outcome. Despite a basic explanation of events by my consultant, no answers had been given as to why this had happened, or if it could have been predicted or prevented.

THINKPOINT FOR LATER

Is the day coming where a patient says to you:
'You assessed my PF in pregnancy…*was I a high risk of anal sphincter injury?'*
'Was I a high risk of obstructed labour and prolapse?'
WHY DIDN'T YOU CHECK / WHY DIDN'T YOU TELL ME?

Montgomery vs Lanarkshire Health Board (Scotland)

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*My last scan at 38 weeks was cancelled by my consultant as **she felt the increasing size of my baby was fueling my anxiety**. To be honest I think she was simply fed up with me constantly asking about the size of the baby. As it turned out, I had every reason to be anxious.*

Months later, after my long recovery I wanted to understand more about Sam's tragic outcome. Despite a basic explanation of events by my consultant, no answers had been given as to why this had happened, or if it could have been predicted or prevented.

It was my sister, through her training in anaesthetics which included that doctors have a duty to fully consent patients, discuss options and inform them of significant risks, that supported me towards finding answers.

We researched what the risk of shoulder dystocia in my particular circumstance might be. After looking through general medical council and Obstetric college guidelines, as well as many scientific papers on the subject, it became clear that my care with regard to explanation of risks, options for delivery and informed consent had been well below standard.

Montgomery vs Lanarkshire Health Board (Scotland)

Quotes from Nadine continued…

***I uncovered that I had a predicted 9-10% risk of shoulder dystocia with the risk factor of diabetes alone**, and this was increased further by my small stature and Sam predicted to be large.*

I was devastated to uncover that these crucial risk factors had not been disclosed to me despite my requests antenatally.

(NADINE TOOK HER CASE TO COURT)

Our journey through the courts was long and arduous. Dr McLellan herself and all four expert witnesses stated that 'if they mentioned the 9-10% risk of shoulder dystocia to women during pregnancy, most if not all diabetics would ask for a caesarean section'.

I was devastated that I had not been given the information I was entitled to, nor been allowed to be a partner in the decision making process with regard to the delivery of my child.

Montgomery vs Lanarkshire Health Board (Scotland)

LEGAL PROCEEDINGS

Originally heard in the Outer House of the Court of Session in Scotland in July 2010.

- it failed the 'Court of Session' then went to the Scottish Appeal Court in 2013.
- having failed again was appealed to the **Supreme Court of London in 2015**.

OUTCOME OF THE SUPREME COURT OF LONDON 2015

There was unanimous recognition of

the patient's right to make informed choices

Let's really think about this

Montgomery vs Lanarkshire Health Board (Scotland)

Sutherland 2021[2] (published in the International Urogynaecology Journal)

QUOTES

1. For many years medical paternalism has been the dominant and acceptable model, with doctors seen as uniquely qualified to decide for the patient what is in their best interests[p2005]

NOTE

Lady Hale (Judge of the Supreme Court),
In her ruling stated the she had determined through the testimony provided:

the view of the consultant was not a purely a medical judgement, but rather at least in part a moral belief that vaginal delivery is preferable to caesarean section, so much so that the consultant felt it justified depriving the pregnant woman of the information needed to make a free choice in the matter [p2007]

Montgomery vs Lanarkshire Health Board (Scotland)

Sutherland 2021[2] (published in the International Urogynaecology Journal)

QUOTES

1. For many years medical paternalism has been the dominant and acceptable model, with doctors seen as uniquely qualified to decide for the patient what is in their best interests[p2005]
2. **Following the decision in *Montgomery v Lanarkshire Health Board* ("Montgomery") the traditional 'doctor knows best' approach is no longer an acceptable model, with the decision recognizing the right of competent patients to make autonomous choices about their own healthcare[p2005-2006]**
3. This change means that the doctor's role is to deliver information in a way the patient can understand, to enable the patient to be the ultimate decision maker [p2006]
4. **The decision in *Montgomery* has important implications for those involved in counselling pregnant women and it is suggested it is relevant *not only* in relation to potential risks to the baby, but also potential risks to the mother[p2006]**

Montgomery vs Lanarkshire Health Board (Scotland)

FURTHER OUTCOMES OF THE SUPREME COURT OF LONDON 2015

Lady Hale (Judge of the Supreme Court) stated that

*"Pregnant women should be offered **evidence-based information** and support to enable them to make informed decisions about their care and treatment"*, and that

"Gone are the days when it was thought that, on becoming pregnant, a woman lost not only her capacity, but also her right to act as a genuinely autonomous human being"

She went on to say…

*"**When there is 'heightened risk'** [compared to standard low risk birth] from vaginal delivery, **there should be a pro-active discussion** by the health practitioner with the mother.*

She also stipulated that heightened risk is not only with respect to risks to the baby, but also with respect to the mother's risks, and that "those include risks associated with giving birth, as well as any after-effects" [p2008].

Montgomery vs Lanarkshire Health Board (Scotland)

Lady Hale (Supreme Court Judge) took specific time to comment that

a mother may place great value on giving birth naturally and be prepared to take the risks to herself and the baby which this entails,

(ie it is her right to choose a vaginal birth even if there is significant risk)

however….

there was also no good reason why the same should not apply in reverse… the mother may choose to forgo vaginal delivery to avoid some not insignificant risk to herself [p2007]

Information Disclosure – Legal Responsibility


ORIGINAL ARTICLE

The right of patients to make autonomous choices: *Montgomery v Lanarkshire Health Board*: a landmark decision on information disclosure to patients in the UK

Lauren Sutherland QC[1]

CLARIFICATION POINT
This is NOT saying that we shouldn't promote vaginal birth.
It is saying we shouldn't be so focused on vaginal birth that we are deliberately not giving balanced information on risks

Sutherland 2021[2] states that

*"Following the decision in Montgomery it must be questioned whether there should be a review of any culture that promotes natural childbirth, **whereby mothers are not being given balanced information** on the options available to them and the risks and benefits of those options" [p2009]*

"Clinicians may need to consider whether there should be a discussion about the risks of maternal birth trauma as a result of vaginal delivery and the potential long-term consequences of urinary and faecal incontinence and pelvic organ prolapse" [p2009]

Education on PF Risk in Vaginal Birth

Skinner et al 2018[6]

Performed semi-structed interviews of n = 40 women post-partum with known pelvic floor trauma.

The template consisted of open-ended questions

- 36/40 women reported no information provided antenatally on potential PF morbidities
- 27/40 reported symptoms of post-traumatic stress disorders

Overall, women reported they feel traumatised because such morbidities were not discussed prior to birth and abandoned because they were often not even discussed postpartum

Dessie et al 2015[7]

Performed a cross-sectional survey of n = 173 obstetric care providers (midwives, obstetricians):

- 56.3% reported never discussing risk of PP urinary incontinence during pre-pregnancy counselling
- 73.7% reported never discussing risk of postpartum FI during pre-pregnancy counselling

The most common reason cited was lack of time (39.9%) followed by lack of sufficient training (30.1%)

PFD and Maternal Choice

Let's think about....

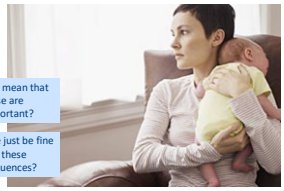
"Significant Pelvic Floor Dysfunction"

(not just mild PFD, but significant PFD)

- *Significant Urinary Incontinence*
  - *soaking 5-6 pads / day*
- *Significant Anal Incontinence*
  - *accidents 2-3 times / day*
- *Significant Pelvic Organ Prolapse*
  - *Stage II – III Anterior, Posterior and uterine*

Does that mean that these are unimportant?

Should she just be fine with these consequences?



BUT FIRST AN ACKNOWLEDGEMENT.....

I fully acknowledge that this

1. is not the same as considering the possibility of a shoulder dystocia
2. she has a live baby!
3. she is alive!

Yes..... these are the most important things.

Intrusive thoughts women are *'not meant to think'*

Let's think about....

"Significant Pelvic Floor Dysfunction"

(not just mild PFD, but significant PFD)

- *Significant Urinary Incontinence*
  - *soaking 5-6 pads / day*
- *Significant Anal Incontinence*
  - *accidents 2-3 times / day*
- *Significant Pelvic Organ Prolapse*
  - *Stage II – III Anterior, Posterior and uterine*

A QUESTION FOR YOU ALL....

What do you think this woman was thinking when this photo was taken?

To be honest.....

common answers in my clinic often involve a combination of ***regret, anger, guilt..... and emotional turmoil***

QUESTION

How many women have
significant pelvic floor trauma
or **significant pelvic floor dysfunction**
after birth?

note:

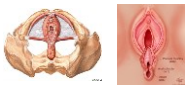
PF trauma is different to *PF dysfunction*

not everyone with PF trauma has PF dysfunction, and not everyone with PF dysfunction has PF trauma

Pelvic Floor Trauma

TWO MAIN TYPES IN BIRTH

SUPERFICIAL PF TRAUMA
(usually perineal tearing)



Perineal, labial and clitoral tears

'SIGNIFICANT' usually = anal sphincter tears

DEEP PF TRAUMA
(levator ani trauma)

Levator Ani Avulsion

Levator Ani Microtrauma / Ballooning

Pelvic Floor Trauma

Main focus today
SIGNIFICANT
SUPERFICIAL PF TRAUMA
(usually perineal tearing)

Perineal, labial and clitoral tears

'SIGNIFICANT' usually = **anal sphincter tears**

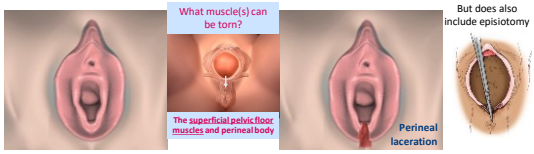
Can we predict who is at risk?
What is the implication on choices for birth?

So we are all on the same page...

Let's start by just reviewing what we mean by...

Superficial PF Trauma and Anal Sphincter Tears

Mainly refers to spontaneous tearing of **the perineum** as the head / shoulders are born.



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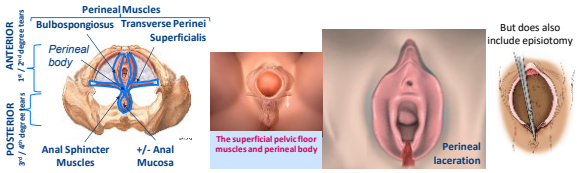


So let's look at different grades…

Perineal Lacerations

GRADES

Anterior Perineal Tears

1st degree

laceration of the **vaginal epithelium** or perineal skin only (no muscles)

2nd degree — 1st / 2nd: known to heal well and have minimal functional impact

vaginal epithelium + **perineal muscles** (but not the anal sphincters)

Posterior Perineal Tears

3rd degree

laceration that involves disruption of the **anal sphincter muscles**

4th degree

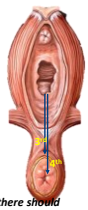
disruption of the **anal sphincter muscles plus the anal mucosa**

Perineal Lacerations

FUNCTIONAL IMPACT: **OASI** are the primary risk factor for both immediate and long term **fecal incontinence**, and are also associated with significant rates of **dyspareunia.**

Obstetric Anal Sphincter Injuries ('OASI')

'significant' perineal tears involving the anal sphincters



AND REMEMBER!!! Sutherland (QC Barrister) 2021 stated that

"Clinicians may need to consider whether there should be a discussion about the risks of maternal birth trauma, and the potential long-term consequences of urinary and faecal incontinence and pelvic organ prolapse" [2p2009]

and Lady Hale (Judge of the Supreme Court) stated that

***"When there is 'heightened risk'** [compared to standard low risk birth] from vaginal delivery, **there should be a pro-active discussion** by the health practitioner with the mother* [2p2008].

Perineal Lacerations

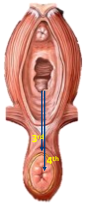
Different sub-types of OASI? Is this just 3rd vs 4th?

Let's go down a little garden path for a minute…

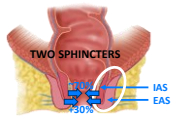
BUT THERE IS A COMPLICATING FACTOR

Different sub-types of OASI have differing levels of 'risk for FI'

??



Anatomy reminder: Anal Sphincter Complex



IMPORTANT NOTE

Internal Anal Sphincter (IAS)

- smooth muscle / automatic / involuntary
- ~ 70% of anal closure pressure most of the day
  (but activity reduces with large rectal volumes)

External Anal Sphincter (EAS)

- skeletal muscle / somatic / voluntary
- ~ 30% of anal closure pressure most of the day
  (however, increases activation when IAS relaxes)

Therefore, simply saying an OASI effects the 'anal sphincters' is a bit vague??

The IAS is the higher contributor most of the day and is involuntary (and so can't be rehabilitated if damaged),

however…

The EAS is the primary muscle we need during intermittent times of 'urge to defecate' and is voluntary so can be strengthened…

Obstetric Anal Sphincter Injuries (OASI)

OASI = Grade 3 and Grade 4 perineal lacerations

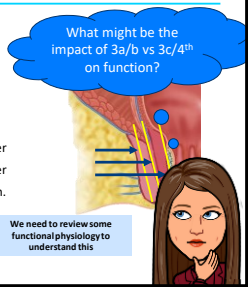
- Grade 3: involves anal sphincter muscles
- Grade 4: involves anal sphincter muscles *plus anal mucosa*

Grade 3 further subdivided into

- Grade 3a: <50% thickness of external anal sphincter
- Grade 3b: >50% thickness of external anal sphincter
- Grade 3c: external plus internal anal sphincter torn.

3a / b OASI: effect the EAS only

3c / 4th OASI: effect both the IAS and the EAS



EAS vs IAS Function

REMEMBER

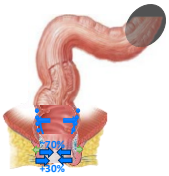
There are TWO reflexes that occur when peristalsis propels faecal matter into the rectum

one that REDUCES activity of the INTERNAL ANAL SPHINCTER

one that INCREASES activity of the EXTERNAL ANAL SPHINCTER

Recto-anal Reflexes with Urge to Defecate

1. RECTOANAL INHIBITORY REFLEX (RAIR)



The reflex that **switches off the IAS** when large volume faecal matter arrives at the rectum

1. Process usually commences with a mass movement of fecal matter into rectum from the descending colon / sigmoid colon (eg due to gastrocolic reflex)
2. Stretch of rectal wall is detected by enteric nervous system sensory neurones in rectal wall, which then triggers....
1. reflexive relaxation of the IAS ....

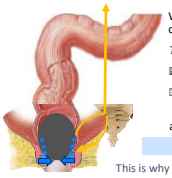
'Recto-anal Inhibitory Reflex' (RAIR)

NOTE

This is an **ENTERIC** nervous system-controlled reflex: RECTAL STRETCH ⍰ RELAX of IAS
(It DOES NOT INVOLVE any pudendal nerve function)

Recto-anal Reflexes with Urge to Defecate

2. RECTOANAL CONTRACTILE REFLEX (RACR)



When RAIR is triggered (ie IAS relaxes), stool moves into upper anal canal... ***whereby somatosensory receptors are activated (a peripheral nerve pathway)***

This leads to both:

⍰ ***sensory signal to S2 and then to brain = 'urge to defecate'***

⍰ ***motor S_2 Reflex:*** *Recto-Anal Contractile Reflex* (RACR)

ie increased contraction of EAS and Puborectalis to maintain anal closure whilst IAS is relaxed

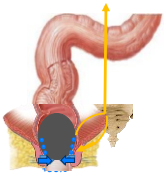
NOTE 1

This is why faecal urge incontinence is associated with a dysfunction of EAS function

NOTE 2

This increased contraction of the EAS is a **sacral somatic** reflex via pudendal nerve
It therefore requires an intact EAS muscle **and functional pudendal nerve**

Recto-anal Reflexes with Urge to Defecate



But for now...

I just need you to remember this for later...

EXTERNAL ANAL SPHINCTER FUNCTION

requires both

INTACT MUSCLE

NORMAL PUDENDAL NERVE FUNCTION

NOTE 2

This increased contraction of the EAS is a **sacral somatic** reflex via pudendal nerve
It therefore requires an intact EAS muscle **and functional pudendal nerve**

QUESTION

Do all OASI sub-grades have the same functional impact?

OASI sub-grades and Faecal Incontinence

Reminder: **St Mark's Incontinence Score**

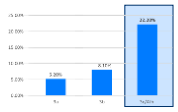
In the past 4 weeks:	*Never*	*Rarely*	*Sometimes*	*Weekly*	*Daily*
Incontinence for solid stool	0	1	2	3	4
Incontinence for liquid stool	0	1	2	3	4
Incontinence for gas	0	1	2	3	4
Alteration in lifestyle	0	1	2	3	4
				No	*Yes*
Need to wear a pad or plug				0	2
Taking constipating medicines				0	2
Lack of ability to defer defecation for 15 minutes				0	4

Vaisey et al 1999 **Score / 24**

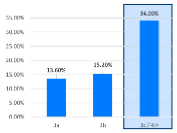
any score of 4 or above is usually regarded as fairly significant

OASI sub-grades and Faecal Incontinence

Everist et al 2020[8]
assessed n = 260 ♀ at
8-9 weeks postpartum
% with SMIS ≥ 6



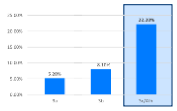
Gommesen et al 2020[9]
assessed n = 556 ♀ at
1 year postpartum
% with SMIS ≥ 4



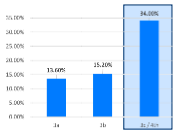
OASI sub-grades and Faecal Incontinence

It is now well accepted that 3c / 4th have much poorer outcomes than 3a/b

8-9 weeks postpartum
% with SMIS ≥ 6



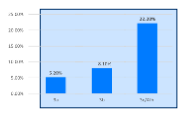
1 year postpartum
% with SMIS ≥ 4



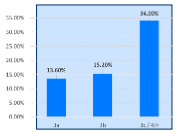
OASI sub-grades and Faecal Incontinence

However, all grades have a risk of fecal incontinence compared to vaginal birth without OASI

8-9 weeks postpartum
% with SMIS ≥ 6



1 year postpartum
% with SMIS ≥ 4



OASI overall & Faecal Incontinence (PFD)

La Cross et al 2015[10]
Performed a systematic review of 19 studies (majority with F/U <1 year postpartum) and found
- **OASI (Grade 3 or 4) was associated with 2.66x the risk of anal incontinence**

OR = 2.66 95% CI 1.77 – 3.98

Johannessen et al 2019[11]
Assessed the risk of anal incontinence 6 years after a first birth and found that
- **OASI (Grade 3 or 4) was associated with 7x the risk of faecal incontinence**

OR = 7.1 95% CI 3.2 – 15.8

Halle et al 2016[12]
Reviewed n = 1,122 women 15 – 23 years after vaginal delivery and found that
- **OASI (grad 3 or 4) was associated with a 8.6x the risk of faecal incontinence**

OR = 8.61 95% CI 3.08 – 24.12

Let's think… re OASI

Education on PF Risk in Vaginal Birth

Johnson et al 2022 – USA STUDY[13]

Research Report

The Importance of Information: Prenatal Education Surrounding Birth-Related Pelvic Floor Trauma Mitigates Symptom-Related Distress

Kimberley T. Johnson, MS[1]
Paula G. Williams, PhD[1]
Audra J. Hill, MD[2]

Johnson KT, Williams PG, Hill AJ. The importance of information: Prenatal education surrounding birth-related pelvic floor trauma mitigates symptom-related distress. The Journal of Women's & Pelvic Health Physical Therapy. 2022 Apr 1;46(2):62-72.

PELVICON

Education on PF Risk in Vaginal Birth

Johnson et al 2022 – USA STUDY[13]

n = 36 women completed surveys / questionnaires at both 2-8weeks and 3/12 PP

Wanted to test whether the level of prenatal pelvic floor education, and / or discrepancy between antenatal expectation vs resultant experience impacted the levels to which postpartum pelvic floor symptoms linked with psychological distress in women postpartum

ASSESSMENTS

1. Pelvic Floor Distress Inventory (PFDI)
2. City Birth Trauma Scale (CBTS) validated measure of birth-related PTSD
3. Edinburgh Postpartum Depression Scale (EPDS)

Also assessed for Birth & Postpartum-Related Emotion from 0= not at all through to 3 = totally
- I am proud of myself - I feel regret - I have feelings of failure

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Education on PF Risk in Vaginal Birth

STATISTICAL NOTE

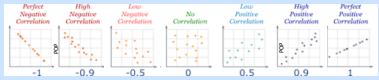
CORRELATION CO-EFFICIENTS

r-values

Correlations refer to how much one variable is linked to another variable

1. **+ve Correlations** refer to when one variable gets bigger the other variable also gets bigger
2. **-ve Correlations** refer to when one variable gets bigger the other gets smaller

The strength of the correlation is then given from



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Education on PF Risk in Vaginal Birth

Johnson et al 2022 – USA STUDY[13]

RESULTS #1: PF SYMPTOMS AND BOTH PHYSICAL AND EMOTIONAL DISTRESS POSTPARTUM

1.1 Pelvic Floor symptoms impacted on ADL's in
- 63% of women at 2-8/52 postpartum
- 40% of women at 3 months postpartum

1.2 There was a strong correlation between **pelvic floor distress inventory scores** and **degree of depression and trauma** at both 2-8/52 and 3 months postpartum
note: r = 0.1 low correlation, r = 0.3 medium correlation, **r >0.5 large correlatio**

Pelvic Floor Distress Inventory Score	2-8 weeks	3months
Edinburgh Postpartum Depression	0.56	0.53
Chilbirth Trauma Scale	0.52	0.58

note #2: **all correlations are POSITIVE.**

But there is two bigger results I want to talk about

PELVICON

Education on PF Risk in Vaginal Birth

Johnson et al 2022 – USA STUDY[13]

RESULTS #2: ANTENATAL PELVIC FLOOR EDUCATION (including on possible trauma)

- only 64% of participants reported learning about pelvic health, birth-related injuries, or prolapse during pregnancy, and ….
- **only 20%** reported learning about this from their provider or birth class, with the majority indicating that this information came from friends, social media, or through their own research.

When comparing women who had / had not received education on PF / PF trauma / Prolapse:

Prenatal PF education was associated with

1. **Lower Childbirth Trauma Scores** 2-8weeks PP: **r = -0.33*** 3months PP: **r = -0.31**
2. **Lower EP Depression Scores** 2-8weeks PP: **r = -0.30** 3months PP: **r = -0.07**
3. **Lower feeling of FAILURE** 2-8weeks PP: **r = -0.23** 3months PP: **r = - 0.29**
4. **Lower feeling of REGRET** 2-8weeks PP: **r = -0.23** 3months PP: **r = - 0.38***
5. **Higher PRIDE** 2-8weeks PP: **r = +0.14** 3months PP: **r = + 0.32***

r-value: -ve / +ve

Education on PF Risk in Vaginal Birth

Johnson et al 2022 – USA STUDY[13]

RESULTS #3: IMPACT OF DISCREPANCY BETWEEN EXPECTATION AND REALITY

- Perceived discrepancy between expectation and reality was significantly associated with all outcome variables, including reported mental health symptoms and feeling of betrayal.
- Individuals with the highest discrepancy between expected and actual experience had the strongest associations between pelvic floor and mental health symptoms

QUOTES FROM DISCUSSION

- ***These findings counter the notion that information begets fear.***
- ***Importantly, providing pregnant people with accurate information that can be used to make decisions is not in conflict with empowered birth.***
- ***On the contrary, having sufficient knowledge to maintain agency and make informed decisions is generally considered a critical aspect of a positive birth experience.***

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Let's think… re OASI

Most women aren't even aware (have never been told) that an anal sphincter injury can even happen in birth…

But that's because we don't want to scare women unnecessarily

and only 2-4% of women will have an OASI

FIRST POINT

Is that really **our right** to choose what information we **tell vs withhold (paternalistic healthcare)?**

SECOND POINT

Whilst I can understand not wanting to scare women with thoughts of anal sphincter tears when the risk is small…

Is the risk **really only 2-4%** for all women??

We are back to the shoulder dystocia issue…

If some women have a much higher risk, don't they have a right to know?

PELVICON

Factors that alter the risk of OASI…

- Perineal Length at the start of labour
- Racial Background
- Fetal Size
- Family History
- Epidural Analgesia

Let's look at some of these

Then in labour

- Forceps Delivery
- Second Stage Duration
- Use of Episiotomy and Type of Episiotomy

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1. Perineal Length vs OASI Risk…

BACKGROUND INFORMATION

Perineal length is measured **from the '<u>posterior forchette</u>'…** **to the '<u>mid anus</u>'**

PERINEAL LENGTH VARIES IN WOMEN!!

<u>At rest:</u> at the <u>end of pregnancy</u> or <u>early first stage</u>:

Study Authors	Number of ♀	Time Measured	Perineal Length
Dua et al 2009[14]	984	1st stage	3.67cm
Aytan et al 2005[15]	400	1st stage	3.65cm
Geller et al 2014[16]	73	3rd trimester	3.61cm
Yeaton-Massey et al 2015[17]	133	3rd Trimester	4.00cm
	AVERAGE	**3.7cm**	
But!!!	**RANGE**	**2.0 – 5.0cm**	
	'SHORT PB'	**2.0 – 3.0cm (vs 3 – 5cm)**	

Risk of OASI in this sub-group

PELVICON

1.1 Short Perineal Length < 3cm

Djusad et al 2021[18]

n = 126 ♀ had perineal length assessed in <u>early 1st stage</u>

1st finding: those who had an OASI had sig. shorter perineal length in early 1st stage: **2.9cm vs 3.3cm**; p <0.001

2nd finding: ♀ with Perineal Length **< 3cm** (ie a short perineal length) were 5x more likely to sustain OASI

aOR = 5.26; 95%CI 1.52 – 18.18

Geller et al 2014[16]

n = 73 ♀ had perineal length assessed at the end of pregnancy (35-37/40)

- in ♀ with Perineal Length > 3cm: = 11.5% OASIS
- in ♀ with Perineal Length **< 3cm**: **= 40% OASI p = 0.038**

Deering et al 2004[19]

n = 234 ♀ had perineal length assessed in early 1st stage

- in ♀ with Perineal Length > 2.5cm = 5.6% OASIS
- in ♀ with Perineal Length **< 2.5cm** **= 40% OASIS p = 0.004**

In addition…. Dua et al 2009[14] found that <u>every 1cm increase</u> in perineal length from 2 🡒 5cm there was a <u>32% reduction</u> in risk of OASI

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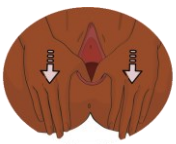
What should we be discussing with women who are high risk of OASI?

Perineal Massage



From: https://mumbubhub.co.uk/blogs/news/how-to-do-a-perineal-massage

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Perineal Massage anything else?

Abdelhakin et al 2020[20] – Systematic Review

Performed a systematic review of n = 11 RCT's with n = 3,467 women

Found that antenatal perineal massage was linked to a significant reduction in in third- and fourth degree perineal tears, a significant reduction in episiotomy, no difference in first or second degree tears

- 1st degree RR = 1.14 95% CI 0.83 – 1.56 p = 0.43 ie no increase or decrease
- 2nd degree RR = 0.89 95%CI 0.77 – 1.03 p = 0.12 ie no increase or decrease
- **OASI (3rd / 4th) RR = 0.36** 95%CI 0.14 – 0.89 p = 0.03 **ie 64% DECREASE**

AUTHOR QUOTES FROM DISCUSSION

Healthcare professionals should encourage all pregnant ♀ to perform perineal massage.

However, lack of information and advice regarding this technique, women's resistance to touching themselves, the viscidity of oils administered during perineal massage, the difficulty faced with a large abdomen, and tiring or cramping of the fingers are the obstacles facing routine antenatal perineal massage implementation.

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Factors that alter the risk of OASI…

- **Perineal Length at the start of labour**
- Racial Background
- Fetal Size
- Family History
- Epidural Analgesia

Then in labour

- **Forceps Delivery**
- **Second Stage Duration**
- Use of Episiotomy and Type of Episiotomy

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Forceps Delivery & Second Stage Duration

Packet et al 2023[21] – Systematic Review and Meta-Analysis - FORCEPS

Reviewed n = 21 papers and found that found that

➢ OASI was associated with a **shorter perineal length** **MD = 0.6cm shorter** 95% CI -1.09 to -0.11cm
But that even after controlling for perineal body length….

➢ **Forceps Delivery** was a significant risk factor for OASI **OR = 3.56** 95%CI 1.31 – 9.67

Meyer et al 2020[22] – PROLONGED SECOND STAGE

Performed a population based historical cohort study of all primiparous women from 2011 – 2019

n = 84,408 women of which n = 57,223 (67.8%) had unassisted vaginal deliveries

Found that OASI was independently associated with **prolonged second stage**:

Intact – 2nd Degree Tear	OASI
2nd stage: 95minutes	2nd stage: 109min
OR = 1.23 per 30min	

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CLINICAL NOTE

There are a lot of reasons why someone may end up having a prolonged second stage and / or need an instrumental delivery

Some are completely unpredictable….
eg sudden fetal distress needing expediated
delivery via vacuum or forceps

However… the research is now starting to suggest that certain pelvic floor factors significantly add to the risk of a prolonged second stage or need for instrumental delivery

Levator Function and Obstructed Labour

Youssef et al 2019[23]

n = 284 low risk nulliparous ♀ recruited just prior to the onset of labor

Assessed for presence of abnormal LAM co-activation on bearing down

LAM co-contraction found in 31.3% of ♀, and persisted despite feedback in 26.4%.

IMPACT ON BIRTH

Compared to women with normal pelvic floor muscle relaxation on bearing down, women who demonstrated persistent co-activation were found to have longer second stage

Women with Normal LAM Relaxation	Women with LAM Co-Activation
2nd stage: **63 ± 42min**	2nd stage: **83 ±63min** p = 0.006
Hazard Risk for Prolonged Second Stage in ♀ with Co-Activation	= **1.5** 95%CI 1.08 – 2.09; p = 0.017

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Levator Function and Obstructed Labour

Brunelli et al 2020[24]

Assessed LAM function on Valsalva by TP-US in n = 486 nulliparous ♀ at 37-41 weeks

Split into 3 groups based on degree of LAM relaxation on bearing down

- Group 1: >75th Centile: 15.8% increase in LAM diameter on bearing down
- Group 2: 25 – 75th Centile: 7.1% increase in LAM diameter on bearing down
- Group 3: < 25th Centile: 1.1% reduction (non-relaxing LAM) on bearing down

RESULTS

Women with the highest ability to relax their levator ani on Valsalva, had the lowest incidence of operative delivery, and the shortest duration of active second stage

	Group 1 15.8% increase	Group 2 7.1% increase in APD	Group 3 (non-relaxing)
Operative Delivery	35%	46%	49%
Active 2nd Stage (min)	42min	51min	50min

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THINKPOINT

What does this mean for PFMT in pregnancy?

Pelvic Floor Muscle Training

Youssef, Brunelli, Pilu, Dietz 2021[25]

QUOTES

Labor is a complex process, however several authors have proposed predictive models for labor outcome by combining transperineal ultrasound parameters with other predictors, such as maternal age, fetal biometry, head position and cervical status.

Pelvic floor dimensions and proper relaxation also now seem to play a key role in childbirth.

The question of whether we can achieve better labor outcomes by improving pelvic floor function remains unanswered, [however the authors then present the following table as their suggestion.....]

TABLE
A list of clinical suggestions for using pelvic floor ultrasound in pregnant women

Parameter	Potential benefits
Change in levator hiatal dimensions under the Valsalva maneuver	Identify women with inadequate or absent pelvic floor muscle relaxation These women can undergo pelvic floor education, visual feedback, and physiotherapy to improve pelvic floor muscle relaxation, thus helping them push more efficiently
Change in levator hiatal dimensions under PFMC	Identify women with inadequate or absent pelvic floor muscle contractility These women can undergo pelvic floor education, visual feedback, and physiotherapy to improve PFMC, thus optimizing their benefit from pelvic floor muscle exercise

PFMC, pelvic floor muscle contraction

Youssef. Pelvic floor and labor outcome. Am J Obstet Gynecol MFM 2021.

Pelvic Floor Muscle Training

2.1 Sobhgol et al 2020[26] – SYSTEMATIC REVIEW AND META-ANALYSIS

Performed a systematic review of n = 16 papers with 2,829 women included

It was found that pelvic floor muscle training….

1. **↓ed the duration of second stage** **MD = -20.9min** 95%CI -31.8 to -9.97 p = 0.0003
2. did not significantly reduce the rate of instrumental birth RR = 0.84 95%CI 0.67 – 1.06 p = 0.84
3. did not change the rate of intact, 1st or 2nd degree tears RR = 0.96 – 0.94 p-values = 0.78; 0.93; 0.84
4. **↓ed the rate of OASI*:** **3rd degree RR = 0.62** 95%CI 0.35 – 1.08 p = 0.09*
   4th degree RR = 0.07 95%CI 0.01 – 0.54 p = 0.01

*authors state that due to small numbers and therefore wide confidence interval, 3rd degree reduction did not reach statistical significance

Which lead us to look at ….

Pelvic Floor Muscle Training


NICE guideline

Pelvic floor dysfunction: prevention and non-surgical management

NICE guideline
Published: 9 December 2021

NICE Guidelines 2021[27]

1.3.12 Consider a 3-month programme of supervised PFMT from week 20 of pregnancy, for pregnant women who have a first degree relative with pelvic floor dysfunction

1.3.16 Supervision should involve

- **assessing** the woman's ability to perform a pelvic floor contraction **and relaxation**

- tailoring the PFMT programme to the woman's ability to perform a PF contraction **and relaxation**, any discomfort felt, and her individual needs and training goals

Factors that alter the risk of OASI…

- **Perineal Length at the start of labour**
- Racial Background
- Fetal Size
- **Family History**
- Epidural Analgesia

Then in labour

- **Forceps Delivery**
- **Second Stage Duration**
- Use of Episiotomy and Type of Episiotomy

3. Family History

We don't have a lot specifically for OASI…..however:

Baghestan, Irgens, Bordahl and Rasmussen 2013[28]

Reviewed n = 393 856 mother-daughter pairs and n = 134 889 woman - sister pairs

RESULTS

If woman's mother had previously had an OASIS: aRR = 1.9 (1.6 – 2.3)

If woman's sister had previously had an OASIS: aRR = 1.7 (1.6 – 1.7)

CONCLUSION

There appears to be increased familial aggregation of OASIS. These risks are stronger through the maternal rather than the paternal line, suggesting a strong genetic role that shapes aggregation of OASIS within families.

But it does lead me to also talk about…

4. Race vs OASI risk

Williams et al 2019[29]

n = 1179 1st vaginal deliveries greater than 35/40 assessed retrospectively

RACE	% OASI
Black	**2.7%**
Latina	**3.6%**
White	**5.1%**
Asian	**9%**

- Black and Latina women had the lowest rates at 2.7% and 3.6%
- Asian women had the highest OASIS rate at 9%

Overall, race remained statistically significant for OASI risk after controlling for other variables such as maternal age, gestational age at time of delivery, and instrumental delivery (p = 0.02).

I promise this is not a one-off finding

and we have known it a long time!

4. Race vs OASI risk – ASIAN ethnicity

Kudish et al 2013[30]
Reviewed n = 46,239 vaginal deliveries
Rate of OASI: Caucasian / white women: 4.1%
women of Asian descent **11.4%**

Brown et al 2018[31] (Australian Study)
Review of n = 10,750 singleton, primiparous vaginal deliveries
Rate of OASI: caucasian / white women: 2.9%
middle eastern women 3.5%
women of south Asian Descent: **10.1%**

Handa et al 2001[32]
Did a review of **> 2million births** between 1992 – 1997
Women of **S. Asian descent were 2.5x more likely to have an OASI**

THINKPOINT

In Australia….. (and many other western countries)

Our BIRTH POLICIES
Our BELIEF SYSTEMS
Our APPROACH TO EDUCATION

is often based off research where the predominant cohort in the research is white

Is that valid to apply to someone whose tissue make-up is south east Asian??

GROUP QUESTION

What are your thoughts / beliefs on episiotomy and anal sphincter injury?

Mediolateral Episiotomy in Asian Women

Bates et al 2019[33]

BACKGROUND

Obstetric anal sphincter injury (OASIS) rates are reported to be higher in Asian women living in Western countries than in those living in Asia.

AIM OF STUDY

To prospectively compare OASIS rates in primiparous Asian women in an Asian and Western birth unit and determine potential birth factors that may influence the possible difference in OASIS incidence.

STUDY PARTICIPANTS

n = 70 nulliparous women of Asian decent birthing in Hong Kong, China

n = 66 nulliparous women of Asian decent birth in Sydney, Australia

What were the outcomes?

Mediolateral Episiotomy in Asian Women

Bates et al 2019[33]

RESULTS HONG KONG AUSTRALIA

- Rates of Episiotomy were significantly higher in Hong Kong: **82.9%** vs 59.2% p = 0.007
- Rates of OASI were significantly lower in Hong Kong: 10% vs 34% p = 0.001

This seems particularly high??

Not for many Asian hospitals who acknowledge the risk in Asian women is different!

Any other times an episiotomy should be at least considered??

Episiotomy in Operative Deliveries

Okeahialam et al 2022 – Systematic Reivew

Performed a systematic review and meta-analysis of n = 31 studies with n = 703,977 patients to determine the impact of episiotomy in operative deliveries (forceps and vacuum)

RESULTS

1. in nulliparous women, mediolateral or lateral episiotomy results in a statistically significant reduction in OASI in for both forceps and ventouse deliveries

	n participants	OR for MLE / LE	p-value	NNT
Nulliparous Forceps (12 studies)	n = 165,636 83.7% had MLE/LE	**0.32** (0.22 – 0.46)	**<0.0001**	**8**
Nullipar Ventouse (21 studies)	n = 467,453 71.6% had MLE.LE	**0.51** (0.35 – 0.73)	**=0.0003**	**23**

2. however… the reduction did not reach statistical significance for multiparous women

	n participants	OR for MLE / LE	p-value	NNT
Multiparous Forceps (8 studies)	n = 8,218 67.8% had MLE/LE	0.48 (0.18 – 1.25)	0.13	n/a
Multipar Ventouse (9 studies)	n = 52,188 55.3% had ML/LE	0.58 (0.26 – 1.27)	0.17	n/a

QUESTION

What can you see as the implication of this knowledge when speaking with your patients during their pregnancy?

RESULTS

1. in nulliparous women, mediolateral or lateral episiotomy results in a statistically significant reduction in OASI in for both forceps and ventouse deliveries

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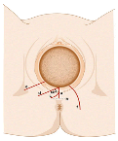
Little note…. *any other time???*

Okeahialam et al 2022 – SYSTEMATIC REVIEW

SIDE NOTE – EDUCATION (from paper discussion p.1400)



Mediolateral Episiotomy (d)

The incidence of OASI with MLE has been shown to reduce by 50% for every 6° sutured away from the midline

MLE should be performed at

'60° from the midline, at the time of crowning'

post-delivery angle of 45 from the midline.

Lateral Episiotomy (e)

Begins 1-2cm away from the midline

Been shown to not differ significantly from mediolateral episiotomy in incidence of OASI

Results for this meta-analysis therefore combined MLE /LE

HOWEVER…Midline Episiotomy (a)

Is known to increase the risk of OASI and therefore studies using midline episiotomy were not included in this systematic review and meta-analysis

Episiotomy and Short Perineal Length

Geller et al 2014[16]	**Aytan et al 2005[15] – with Episiotomy**	
Perineal Length <3cm **no Episiotomy**	Perineal Length <3cm **Midline Episiotomy**	**Mediolateral Episiotomy**
OASI Rate = 40%	**OASI Rate = 29.5%**	**OASI Rate = 2.1%**

Any other final comments / questions?

Let's look at two case studies…

Case Study 1

Jessica is a 26yo G1P0 ♀ who presents to your clinic at 35/40.

She states that she **works as a nurse at an aged care residential facility** and is very aware of how many older residents get admitted to nursing homes due to faecal incontinence. She doesn't want that to be her future.

She has been thinking about whether it is better to request a caesarean birth to protect her pelvic floor, but also likes the thought of having a natural birth.

She has been told that her baby is tracking almost exactly on the 50th centile for both weight and head circumference

General History:

no significant medical history and no complications in preg

Personal PF Symptoms:

she has noticed some occasional UI with coughing in the last few weeks, but has experienced no FI or vaginal heaviness.

Case Study 1

VAGINAL EXAMINATION

PFM Strength (MOS) 3/5

Endurance : can sustain 7sec hold x 5

GH = 2.8cm PB = 3.2 (at rest)

GH = 3.1 PB = 3.9 (valsalva)

FURTHER INFORMATION

Race / Ethnicity: caucasian

Pre-Pregnancy Weight: 62kg

Current Weight at 37/40: 74kg

Height: 167cm

Case Study 2

Jemma is a 32yo G1P0 ♀ presents to your clinic at 35/40.

She explains that her sister had a really difficult birth 3 years ago and has experienced both UI and some FI since.

Her sister has strongly encouraged her to perform pelvic floor exercises throughout her pregnancy, as she has told Jemma that she *"did not perform them as her midwife encouraged her to do and now regrets it"*.

Jemma reports that she has therefore been diligent with her pelvic floor exercises throughout pregnancy and has not experienced any incontinence, but is wondering whether she should request an LSCS.

Her obstetrician is open to whichever birth mode she prefers however she is not sure if she will feel disappointed if she doesn't get to experience a vaginal birth.

Case Study 2

VAGINAL EXAMINATION

PFM Strength (MOS) 4/5

Endurance : 10sec hold x 10

GH = 2.4cm PB = 2.8 (at rest)

GH = 2.6 PB = 2.9 (valsalva)

OTHER INFORMATION

Race / Ethnicity: Indian

Pre-Pregnancy Weight: 49kg

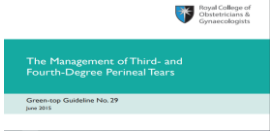
Current Weight: 66kg

Height: 161cm

2nd Birth after OASI

Note

In Australia, our guidelines are based off the RCOG Green-top Guideline No.29 (2015) on "Management of Third and Fourth Degree Tears"



They will always be the most up-to-date guidelines whilst these two people are alive and working.

Why the UK Guidelines???

Quite simply…

it is the home of Abdul Sultan and Ranee Thakar

Photo after having breakfast with them at the 2015 IUGA Conference in Nice, France

2nd Birth after OASI

RCOG 2015 – Green-top Guideline No. 29

The Management of Third- and Fourth Degree Tear, p. 4

"All women who sustained OASIS in a previous pregnancy should be counselled about the mode of delivery in a subsequent birth"

All women who have sustained OASIS in a previous pregnancy and who

- are symptomatic, or
- have abnormal endoanal ultrasonography, or
- have an abnormal manometry

should be counselled regarding the option of **elective caesarean birth.**

1. Patients with Symptoms After OASI

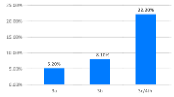
QUICK NOTE

Remember that not all patients are symptomatic after OASI

Everist et al 2020[8]

n = 260 ♀ at 8-9 weeks postpartum

% with SMIS ≥ 6

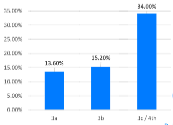


The chance of being symptomatic is higher for 3c/4th than 3a/b but in all groups there are people who recover well and those who don't

Gommesen et al 2020[9]

assessed n = 556 ♀ at 1 year postpartum

% with SMIS ≥ 4



1. Patients with Symptoms After OASI

ORIGINAL STUDY: Fynes et al 1999, published in The Lancet[35]

Followed n = 59 women through two consecutive births

Results #1: Immediately after FIRST birth

n = 46 (78%)
asymptomatic for FI

n = 13 (22%)
altered fecal continence

recovery

all n = 46 100%
remained asymptomatic between pregnancies and during 2nd pregnancy

n = 5/13 38%
regained fecal continence before 2nd pregnancy

n = 8/13 62%
persistent symptoms during 2nd pregnancy

In theory…. all these women 'seem fine' in their second pregnancy

Only these appear to have not recovered

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n = 8/13 62%
persistent symptoms during 2nd pregnancy

n = 1/8 12.5%
remained the same after 2nd birth

n = 7/8 87.5%
deteriorated further

This is why the RCOG / RANZCOG recommends that **women who remain symptomatic after a first OASI** should be counselled regarding the option of **elective caesarean section**

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regained fecal continence before 2nd pregnancy

n = 8/13 62%
persistent symptoms during 2nd pregnancy

n = 41/46 89%
remained continent after 2nd birth

n = 3/5 60%
Remained continent after 2nd birth

n = 1/8 12.5%
remained the same after 2nd birth

n = 5/46 11%
became incontinent after 2nd birth

n = 2/5 40%
became incontinent

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all n = 46 100%
remained asymptomatic between pregnancies and during 2nd pregnancy

n = 5/13 38%
regained fecal continence before 2nd pregnancy

n = 8/13 62%
persistent symptoms during 2nd pregnancy

We can't assume that just because a woman managed to become asymptomatic after a first OASI that she will be fine

n = 1/8 12.5%
remained the same after 2nd birth

n = 5/46 11%
became incontinent after 2nd birth

n = 2/5 40%
became incontinent

n = 7/8 87.5%
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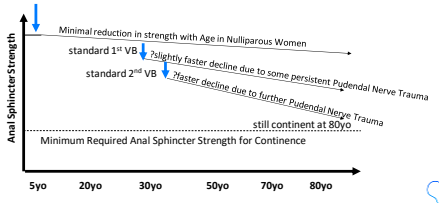
THEORY

adapted from Li et al 2019[36]

most people start with significantly more anal sphincter function that the minimum needed



PELVICON

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adapted from Li et al 2019[36]

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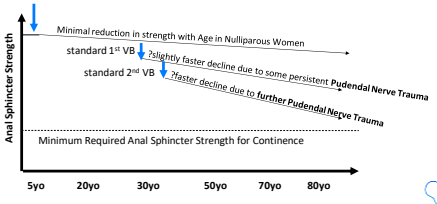
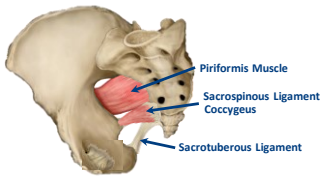


PELVICON

Pudendal Nerve (to External Anal Sphincter)

Let's look at the Pudendal Nerve Pathway..



PELVICON

Pudendal Nerve (to External Anal Sphincter)

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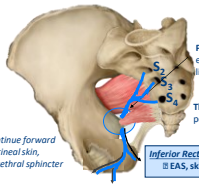


Pudendal Nerve starts it's pathway from S2-4, then exits the pelvis between piriformis and sacrospinous ligament / coccygeus

Then wraps around ischial spine and re-enters the pelvis through the lesser sciatic foramen

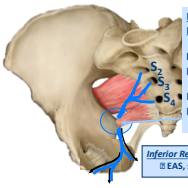
Remaining two branches continue forward through alcock's canal to perineal skin, bulbospongiosus, external urethral sphincter and the clitoris

Inferior Rectal Nerve Branch
- **EAS, skin of anus**

How is pudendal nerve function to the EAS assessed?

Pudendal Nerve (to External Anal Sphincter)

Let's look at the Pudendal Nerve Pathway..



PUDENDAL NERV TERMINAL MOTOR LATENCY TESTING (PNTML)

PNTML TESTING involves stimulating the pudendal nerve at the ischial spine...

Measuring the time from depolarising the pudendal nerve at the ischial spine
- activation of EAS

Inferior Rectal Nerve Branch
- **EAS, skin of anus**

Pudendal Nerve Terminal Motor Latency (PNTML)

A neurophysiological test designed to determine the delay between the stimulation of the pudendal nerve at the ischial spine, and activation of the EAS[9]

EQUIPMENT[9]

Utilises a specially designed electrode attached to glove of assessors examining finger

- electrode at pad of finger to stimulate pudendal nerve
- electrode at base of finger detects activity of EAS

NORMAL = < 2.2ms

What can happen in birth?

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Utilises a specially designed electrode attached to glove of assessors examining finger

- electrode at pad of finger to stimulate pudendal nerve
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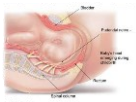
NORMAL = < 2.2ms

What can happen in birth?

2nd stage labour has long been known to result in at least a temporary **PN neuropathy** in some women (due to neuropraxia or crush injury)



- altered PN function in the early weeks PP
- ↓EAS activity

RESEARCH

Lee & Sang-Jeon 2000[37]
- PNTML was prolonged and anal squeeze was reduced at 2-3 days postpartum compared to pregnancy

Sultan et al 1994[38]
- women 6/52 PP demonstrated prolonged PNTML compared to pre-birth
- **amongst women who had prolonged PNTML at 6/52**...
  - 2/3 had recovered, **but 1 in 3 persisted at 6months**

THEORY

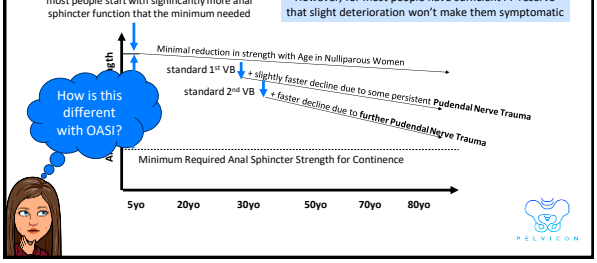
adapted from Li et al 2019[16]

most people start with significantly more anal sphincter function that the minimum needed

NOTE

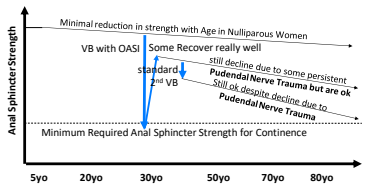
It is fairly common to have *some deterioration* in anal sphincter function over time after ANY vaginal birth,

However, for most people have sufficient PF reserve that slight deterioration won't make them symptomatic



THEORY

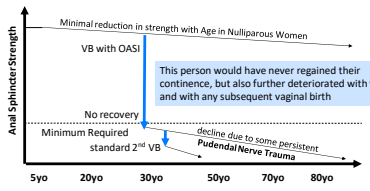
adapted from Li et al 2019[36]



THEORY

adapted from Li et al 2019[36]

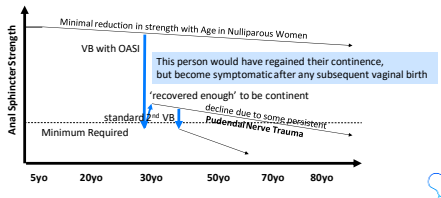
But what if they don't recover well?



THEORY

adapted from Li et al 2019[36]

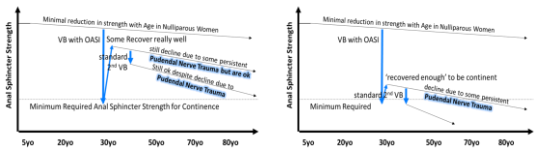
What if they recovered 'a bit' but not fully?



LET'S THINK

CONTINENT LONG TERM

DEVELOPED FI AFTER A SUBSEQUENT VAGINAL BIRTH



The difference is "HOW MUCH" recovery of ANAL SPHINCTER FUNTION occurred?

Let's go back…

2nd Birth after OASI

RCOG 2015 – Green-top Guideline No. 29

The Management of Third- and Fourth Degree Tear, p. 4

INDICATIONS FOR ELECTIVE C-SECTION

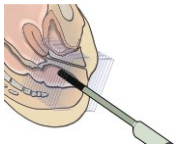
Women should be counselled regarding the option of **elective c-section if:**

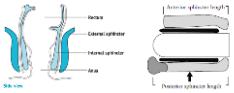
- are symptomatic, or
- **have abnormal endoanal ultrasonography, or**
- **have an abnormal manometry**

Endoanal Ultrasound

endo = inside
anal = anal canal

uses an **endoanal ultrasound probe** to provide a 360° axial view of the anal canal at various levels[9-11]





IMPORTANT NOTE:
In real life: striated fibres are deep red; smooth mm fibres are silvery white

On EA-US they appear opposite: EAS = white

IAS = black

Image a and b from RadiologyKey[12]

PELVICON

Endoanal Ultrasound

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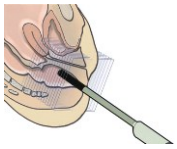

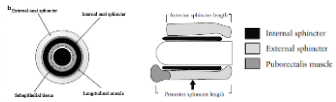

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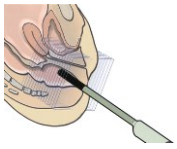
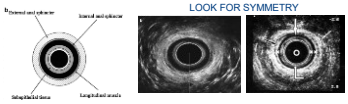


LOOK FOR SYMMETRY



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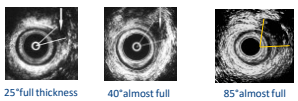
PELVICON

Endoanal Ultrasound

1.EXTERNAL ANAL SPHINCTER DEFECTS

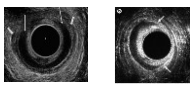


25°full thickness (3b) EAS defect

40°almost full thickness EAS defect

85°almost full thickness EAS defect

2.INTERNAL ANAL SPHINCTER



70°IAS defect between 10.30 and 1.00

135°IAS defect between 12.30 and 5.00

3. OVERLAP REPAIR

PELVICON

2nd Birth After OASI…

Sheer, Thakar and Sultan 2009[39]

n = 73 consecutive women with previous OASIS allocated to vaginal birth or elective c-section for 2nd birth based on whether they had any persistent anal sphincter compromise evident on EAUS and manometry in 2nd pregnancy:

GROUP 1
'No Anal Sphincter Compromise Group'

< 30 degrees damage evident on EAUS
> 20mmHg increment pressure on Manometry

↓

suggested Vaginal Birth as assumed sufficient anal sphincter function reserve to cope with another vaginal birth

GROUP 2
'Anal Sphincter Compromise Group'

> 30degrees damaged evident on EAUS , or
<20mmHg increment pressure on Manometry

↓

suggested c-section as assumed insufficient anal sphincter function reserve to cope with any further deterioration with another vaginal birth

AFTER BIRTH
Neither group experienced significant change in anal incontinence symptoms or QoL post 2nd birth

PELVICON

2nd Birth After OASI…

Jordan, Naidu, Thakar & Sultan 2018[40]

n = 122 consecutive women with previous OASIS allocated to vaginal birth or elective c-section for 2nd birth based on whether they had any persistent anal sphincter compromise evident on EAUS and manometry in 2nd pregnancy:

'No Anal Sphincter Compromise Group'
< 30 degrees damage evident on EAUS
> 20mmHg increment pressure on Manometry

↓

suggested Vaginal Birth

'Anal Sphincter Compromise Group'
> 30degrees damaged evident on EAUS , or
<20mmHg increment pressure on Manometry

↓

suggested c-section

RESULTS

1. No new anal sphincter defects occurred in the vaginal delivery group, however…
2. At 3/12 PP there was reduced squeeze pressure in the vaginal delivery group
3. Despite this, no significant worsening of symptoms observed in any woman in either group

PELVICON

2nd Birth After OASI…

Karmarkar et al 2015[41] – a slightly more detailed criteria

n = 50 women with previous OASIS allocated to vaginal birth or elective c-section for 2nd birth based on whether they had any persistent anal sphincter compromise evident on EAUS and manometry in 2nd pregnancy:

'No Anal Sphincter Compromise Gp' n = 26
1. Asymptomatic
2. EAUS: < 30 degrees damage evident
3. Resting Pressure > 40mmHg
4. Increment Pressure> 20mmHg

→ suggested Vaginal Birth

- n = 24 had vaginal birth → n = 24 remained symptom free
- n = 2 chose c-section → n = 2 remained symptom free

'Anal Sphincter Compromise Group' n = 24
1. Faecal Symptoms, or
2. EAUS: > 30degrees damaged evident , or
3. Resting Pressure < 40mmHg, or
4. Increment Pressure <20mmHg

→ suggested c-section

- n = 20 had planned c-section → n = 20 remained symptom free
- n = 1 unexpected VI → worse AI / faecal urgency
- n = 2 c-section at 7cm and 10cm dilated → worse AI / faecal urgency

Let's finish with two case studies

Case Study: 2nd Birth

32yo G2P1 at 26/40 wanting advice re: mode of delivery for 2nd birth

OBSTETRIC HISTORY

P1: 40^{+5}/40; Induction, NBFD of 3.8kg ♂ with 3b tear
Repaired in operating theatre

BOWEL FUNCTION

- no history of bowel dysfunction prior to 1st pregnancy
- ↓ anal control first 4-6/52 PP w faecal urgency, and ?2-3 episodes of small vol FI
- one episode of constipation in first month with significant straining, managed with glycerine suppositories and Movicol as required for 2-3 weeks

FOLLOW UP CARE

- routine 6/52 check up with obstetrician, advised to speak to GP for referral if any symptoms in the future.
- no symptoms after this point, therefore no further opinion sought.

PELVICON

Case Study: 2nd Birth

THIS PREGNANCY (currently 26/40)

- usually Bristol type 3 with 1-2 defecations per day
- very slight faecal urgency with type 5 stool in morning if taken laxative
- No sensation of vaginal heaviness or bulge
- No flatus incontinence
- No urinary incontinence

VAGINAL EXAMINATION

- GH = 3cm PB = 3.5cm
- No significant POP: Ba = -2, Bp = -2, C = -6
- Levator: MOS 3/5 with 8sec hold, 8 reps

ENDO-ANAL ULTRASOUND

obvious overlap repair with intact EAS and IAS

ANORECTAL MANOMETRY

- Rest Pressure: 45mmHg
- Max Squeeze: 73mmHg
- Endurance: 60-70mmHg for 15-20sec

Let's just vary the case slightly…

Case Study version 2: 2nd Birth

32yo G2P1 at 26/40 wanting advice re: mode of delivery for 2nd birth

OBSTETRIC HISTORY

P1: 40^{+5}/40; Induction, NBFD of 3.8kg ♂ with 3b tear
Repaired in operating theatre

BOWEL FUNCTION

- no history of bowel dysfunction prior to 1st pregnancy
- ↓ anal control first 4-6/52 PP w faecal urgency, and ?2-3 episodes of small vol FI
- one episode of constipation in first month with significant straining, managed with glycerine suppositories and Movicol as required for 2-3 weeks

FOLLOW UP CARE

- routine 6/52 check up with obstetrician, advised to speak to GP for referral if any symptoms in the future.
- no symptoms after this point, therefore no further opinion sought.

PELVICON

Case Study version 2: 2nd Birth

THIS PREGNANCY (currently 26/40)

- usually Bristol type 3 with 1-2 defecations per day
- very slight faecal urgency with type 5 stool in morning if taken laxative
- No sensation of vaginal heaviness or bulge
- No flatus incontinence
- No urinary incontinence

VAGINAL EXAMINATION

- GH = 3.5cm PB = 2.5cm
- No significant POP: Ba = -2, Bp = -2, C = -6
- Levator: MOS 2/5 with 4sec hold, 5 reps

ENDO-ANAL ULTRASOUND

~50 degree defect EAS anteriorly, No IAS defect

ANORECTAL MANOMETRY

- Rest Pressure: 22mmHg
- Max Squeeze: 38mmHg
- Endurance: 30-35mmHg for 10-15sec

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