Postpartum Pelvic Floor Dysfunction

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Objectives

- **To understand the how obstetric delivery impacts pelvic floor function**
- **To appreciate the common pelvic floor disorders experienced by postpartum patients**
- **To discuss the natural history of postpartum pelvic floor disorders**
- **To understand the available treatment options for these conditions**

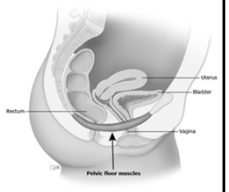
Consider…

Labor has been called, and still is believed by many to be, a normal function … and yet it is a decidedly pathologic process. Everything, of course, depends on what we define as normal. If a woman falls on a pitchfork, and drives the handle through her perineum, we call that pathologic-abnormal, but if a large baby is driven through the pelvic floor, we say that it is natural, and therefore normal.

-DeLee, 1920

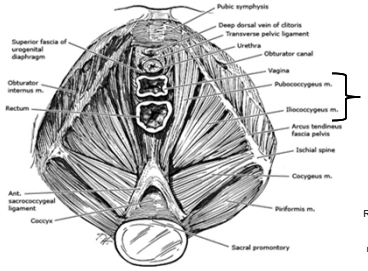
What is the pelvic floor?

- A group of muscles and connective tissue that attaches to the bony pelvis
- Provides support to the pelvic organs
- Defects in this support contribute to variety of pelvic floor disorders:
  - Bladder control issues
  - Bowel control issues
  - Pelvic organ prolapse
  - …And more!



Brubaker L. Patient education: Pelvic floor muscle exercises (Beyond the Basics). In: UpToDate Post TW (Ed), UpToDate, Waltham MA. (Accessed August 24, 2023)

What is the pelvic floor?



Levator ani muscles (puborectalis m. not pictured)

Rogers RG and Fashokun TB. Pelvic organ prolapse in females: Epidemiology, risk factors, clinical manifestations, and management. In: UpToDate Post TW (Ed), UpToDate, Waltham MA. (Accessed August 24, 2023)

So… how common are PFDs?

- NHANES study: 50% of women had at least 1 pelvic floor disorder (PFD)
- 11-19% lifetime risk for undergoing surgery for prolapse or incontinence
- However, this may underestimate prevalence as many women will not elect surgery
  - WHI 41% with a uterus and 38% without had prolapse

Nygaard et al JAMA 2008; Olsen et al Obstet Gynecol 1997; Hendrix et al Am J Obstet Gynecol 2002

Why do women get PFDs?

Risk factors

- Childbirth (especially vaginal deliveries)
- Obesity
- Aging
- Menopause
- Family history
- Connective tissue disorders
- Chronic stress on the pelvic floor (coughing, constipation, etc)

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Impact of pregnancy on pelvic floor…

- In pregnancy, the pelvic floor is placed under increased stress from:
  - Changes in hormonal milieu
  - Weight of the gravid uterus
  - Changes in intra-abdominal pressure
- For many, this translates to:
  - Pelvic and vaginal pressure, heaviness
  - Urinary frequency, urgency, incontinence
  - The first time they have heard of or experienced PFD

And then, delivery

- During delivery, the medial muscles of the levator ani are at greatest risk for injury
  - The pubococcygeus muscle reached a stretch ratio of over 3x, which was an increase in 217%
  - Increasing the fetal head diameter by 9% increased this stretch proportionally

Lien et al, *Obstet Gynecol* 2004; DeLancey et al, *Obstet Gynecol* 2003

And then, delivery

- An imaging study using MRI and ultrasound of primiparous women after vaginal delivery found 20-36% with abnormalities in the levator ani muscles, such as avulsion from the pubic ramus
- These defects put patients at risk for PFDs

Lien et al, *Obstet Gynecol* 2004; DeLancey et al, *Obstet Gynecol* 2003

And then, delivery

There is also nerve compression/stretching:

- Branches of the pudendal nerve are stretched >30%
  - Supplies the clitoris, vulva/distal vagina and anorectum
- This exceeds thresholds known to cause permanent nerve damage in animals (15-20%)
- This damage can contribute to fecal continence issues and loss of vulvar sensation

Lien et al, *AJOG* 2005

And then, delivery

And direct muscle injury:

- 53-79% of women will have a laceration from a vaginal delivery
- Most are 1st and 2nd degree (tear into the vaginal epithelium, perineal body, and pelvic floor muscles)
- Less than 5% will experience more severe tears into the anal sphincter complex or though into the rectum (3rd and 4th degree tears, respectively)

Smith et al, *BMC Pregnancy Childbirth* 2013; Rogers et al, *BJOG* 2014
Friedman et al, *Obstet Gynecol* 2015; Dudding et al, *Ann Surg* 2008

How common are postpartum PFDs?

For primiparous women who had a vaginal delivery, at 1 year postpartum:

- 41% reported stress urinary incontinence
- 32% reported nocturia
- 23% reported flatus incontinence
- 9% had at least stage 2 prolapse on exam

Hill AJ et al. Female Pelvic Medicine & Reconstructive Surgery 2021; 27(8):507-513.

Care of the postpartum mother

- Growing interest in the 4th trimester including enhanced, shorter interval follow-up
- Subspecialty, urogynecology-run peripartum PFD clinics have been growing in number across the U.S.
- These play an essential role for the recovery of women with:
  - Complex or advanced lacerations
  - Wound healing problems
  - Postpartum PFDs

But what can you do?

- Ask the right questions!
  - Many patient will not volunteer bowel or bladder issues without inquiry from their provider
- Remember the 3 B's
  - Bladder
  - Bowel
  - Bulge
- If yes, there are initial treatments you can recommend!

Bladder control definitions

- Urinary incontinence: Involuntary leakage of urine
  - Stress (SUI): Leakage with increases in intra-abdominal pressure (cough, laugh, sneeze, physical activity)
  - Urgency (UUI): Leakage with urgency to void ("gotta go")
  - Mixed (MUI): Both stress and urgency incontinence are present

Bladder control definitions

- Overactive bladder: Syndrome of frequency (>7 voids per day) and sensory urgency ± incontinence (≥3 episodes/day considered severe)
- Nocturia: Nighttime awakening due to an urge to void immediately preceded by sleep

Bowel control definitions

- Fecal incontinence (FI): Involuntary loss of liquid or solid stool that is a social or hygienic problem
- Anal incontinence (AI): Involuntary loss of flatus, liquid or solid stool that is a social or hygienic problem
- Fecal urgency: Inability to defer an urge to defecate

Pelvic organ prolapse definitions

- Herniation of the pelvic organs to or beyond the vaginal walls
  - Cystocele: Anterior vaginal wall, bladder
  - Rectocele: Posterior vaginal wall, rectum
  - Uterovaginal prolapse: Descent of uterus/cervix
- Can also have vaginal vault prolapse (after hysterectomy)

Lessons learned from my patients

Bladder Control Issues

Case #1

A 30 year old G2P2 presented on postpartum day 17 after spontaneous vaginal delivery with 2nd degree laceration

- C/o stress and urgency urinary incontinence (MUI)
- Also reported h/o SUI in pregnancy
- Exam: Healing well, levator squeeze 0/5
- Referred to pelvic floor physical therapy (PFPT)

Case #1

Returned 9 weeks later:

- Continues to have bothersome SUI, affecting QOL
- Completed 4 PFPT sessions, levator squeeze 2/5
- Fit with anti-incontinence pessary- declined
- Recommended continued PFPT, over the counter incontinence vaginal insert
- Discussed surgical management if no improvement

Postpartum Urinary Incontinence

- Incidence of postpartum UI ranges from 3-40%
- Systematic review found:
  - Mean prevalence of any UI was 33% at 3 months
  - Weekly and daily UI was 12 & 3%, respectively
  - Mean prevalence greater in vaginal versus c-section groups (31% vs 15%)
  - Only small changes in UI occurred over the 1st year
- Cohort study found 41% of primiparous women experienced SUI at 1 year, with only 23% experiencing resolution between 8 weeks and 1 year

Thom & Rortveit Acta Obstetricia et Gynecol 2010; Hill et al FPMRS 2021

Postpartum Urinary Incontinence

Childbearing is an established risk factor for UI

- Parity is associated with increased risk of SUI and UUI; vaginal delivery further increases SUI risk
- Increasing age, BMI and family history of UI are risk factors for UI in pregnancy
- Vaginal birth and UI in pregnancy are risk factors for postpartum UI

Rortveit et al NEJM 2003; Sheng et al FPMRS 2022
Solans-Domenech et al Obstet Gynecol 2010

Postpartum Urinary Incontinence

A longitudinal cohort study that contacted patients starting at 3 months out to 12 years postpartum found:

- Persistent UI (SUI >> MUI > UUI) in 24% at 6 years and 38% at 12 years
- 73-76% who reported UI at 3 months continued to report it at 6 and 12 years, respectively

MacArthur et al BJOG 2006; MacArthur et al BJOG 2016

Postpartum Urinary Incontinence

- PFPT is effective for treating SUI, UUI and MUI
- Cochrane review estimated women with postpartum UI who underwent PFPT were 40% less likely to report UI at 12 months than those receiving no treatment
- RCT of PFPT vs education for UI showed decreased UI and bother at 6 months postpartum; patients also had increased muscle strength and duration
- Another RCT of PFPT versus education found no difference in UI at 6 months after delivery in primiparous women

Boyle et al Cochrane 2012; Hilde et al Obstet Gynecol 2013; Sigurdardottir et al AJOG 2020

Postpartum Urinary Incontinence

Other SUI options:

- **Diet and lifestyle modifications**
- **Incontinence pessary, over the counter disposable vaginal *inserts***
- **Urethral bulking***
- **Mid-urethral sling***
- **Retropubic colposuspension (Burch)***

*Would wait until 6 months postpartum before performing this for symptomatic patients

Postpartum Urinary Incontinence

What about mid-urethral sling and subsequent pregnancy?

- **Retrospective case series from Kaiser:**
  - **N= 26 patients with h/o sling**
  - **14/25 deliveries by c-section (5- elective due to sling)**
  - **11 vaginal deliveries**
  - **No sling-related pregnancy complications**
  - **Only 1 with recurrent SUI; ended up getting repeat sling with resolution of symptoms**

Adams-Piper et al FMPRS 2016

Postpartum Urinary Incontinence

A Swedish population-based cohort study

- **207 women with h/o mid-urethral sling; Matched to 521 controls**
- **SUI rate after delivery was not significantly different between the groups (22% in mid-urethral sling, 17% in control)**
- **Vaginal birth had no impact on risk of SUI compared to c-section**

Bergman et al Obstet Gynecol 2018

Postpartum Urinary Incontinence

UUI initial treatment options:

- **Diet and lifestyle modifications**
- **PFPT**
- **Bladder training**

Postpartum Urinary Incontinence

Anticholinergics:

- May pass into the breast milk, can cause excitement or irritability in baby
- Long-term use might reduce milk production or letdown (monitor for signs of neonatal insatiety)
- Single dose unlikely to interfere with breastfeeding

Beta-3 Agonists:

- No data on risk of infant harm or impact on milk supply with use during breastfeeding
- Possible excretion into milk based on drug properties

Postpartum Urinary Incontinence

- Onobotulinum toxin in the bladder is an effective treatment for overactive bladder/UUI, however its use in pregnancy or while lactating is contraindicated
- Sacroneuromodulation (SNM), if already present, should be turned off during pregnancy and for OAB/UUI, would not recommend pursuing this option until at least 6 months postpartum

Bowel Control Issues

Case #2

A 35yo G1P1 presented at 3 weeks postpartum after a forceps-assisted vaginal delivery with 4th degree laceration for evaluation of anal incontinence & fecal urgency

- Started having fecal urgency immediately postpartum
- FI occurred x2 (loose)
- Some pain from her laceration, managed with ibuprofen, and continued spotting

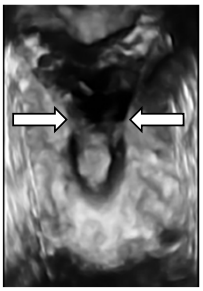
Case #2

- On vaginal exam, wound separation with short perineal body (1.5cm); unable to perform levator squeeze
- On digital rectal exam:
  - Normal resting tone at lateral and posterior portions of sphincter
  - No discernable increase in tone with squeeze anteriorly, so a sphincter defect suspected from from 10 to 2 o'clock

Case #2

Transperineal 3D ultrasound performed:

- Mid to distal internal anal sphincter defect from 11 to 1 o'clock
- External anal sphincter defect from 10 to 2 o'clock



Case #2

- Recommended increasing dietary fiber with option of adding loperamide PRN to bulk stools
- Referred to PFPT
- Discussed lifestyle modifications and possible surgical intervention

Fecal Urgency

- In a multi-center prospective cohort study, at 6 weeks postpartum, fecal urgency was reported in:
  - 38% of women with obstetric anal sphincter injuries (OASIs)
  - 28% of women lower degree lacerations
- A Canadian prospective cohort study reported fecal urgency in 6-28% after OASIs during a follow up period of 1-30 months
- May be as important as stool consistency for FI

Sultan & Thakar, Perineal and anal sphincter trauma. 1st ed. 2009
Macarthur & Macarthur, AJOG 2004; Borello-France Obstet Gynecol 2006

Anal Incontinence

- The frequency of AI after OASIs repair ranges from 15-61%
- Women with OASIs have greater FI, flatal incontinence and FI severity at 6 weeks and 6 months postpartum than women with lesser tears
- Women with 4th degree lacerations reported 10x worse bowel control than those with 3rd degree lacerations (30.8% vs 3.6%, P <0.001)

Evers et al, *AJOG* 2012; Fenner et al, *AJOG* 2003; Handa et al, *Obstet Gynecol* 2012 RCOG *Green-top Guideline* No. 29; Borello-France Obstet Gynecol 2006

Anal Incontinence

- AI is associated with significantly poorer QOL
- Overall prognosis is good with 60-80% of women reporting no symptoms of AI or significant discomfort at 12 months
- However, women with a history of OASIs reported increased anal incontinence 5 to 10 years after their 1st delivery (OR 2.32, 95% CI 1.27-4.26)

Evers et al, *AJOG* 2012; Fenner et al, *AJOG* 2003; Handa et al, *Obstet Gynecol* 2012 RCOG *Green-top Guideline* No. 29; Borello-France Obstet Gynecol 2006

Anal Incontinence

- For women with ≥1 vaginal delivery, the 15-year cumulative incidence of AI was 30.6%
- Operative vaginal delivery was associated with significantly higher hazard of AI (1.75, 95% CI 1.1-2.7) compared to vaginal and c-section groups

Blomquist et al JAMA 2018

Anal Incontinence

Management includes:

- Supportive and lifestyle measures
  - Ritualize bowel habits
  - Stool deodorants (periwash)
  - Avoidance increases in colonic motility (caffeine, brisk activity after meals, insoluble fiber)
- Medical:
  - Bulking stools (Soluble fiber)
  - Loperamide
  - Treat underlying disorders

Anal Incontinence

- PFPT with biofeedback: Data is mixed!
  - RCT compared standard postpartum care to 12 weeks of PFPT in women with OASI→ PFPT resulted in significant reduction in symptoms vs standard care
  - Cochrane review demonstrated unclear benefit, but trials were small to moderate, lots of heterogeneity, and no long-term data
  - RCT of PFPT/biofeedback vs standard of care in OASI found significant improvement from baseline to 12 weeks, but no differences between the groups

VonBargen et al FPMRS 2021; Woodley et al. Cochrane Database 2017
Oakley et al FPMRS 2016

Anal Incontinence

- Secondary sphincteroplasty: Data is lacking…
  - Initial success 60-80%, but poor long-term success- as low as 6% at 10 years
  - Definition of success in studies varies widely
  - Limited well-designed studies with heterogeneous patient populations
- Vaginal E-stim: At 13w was associated with more AI symptoms than sham and is <u>not</u> recommended

Brown et al 2013; Fernando et al 2006: Brown et al 2021
Guiterrez et al 2004; Richter et al 2015

Anal Incontinence

- Sacroneuromodulation (SNM)
  - Also FDA approved for FI
  - RCT of SNM versus sphincter collagen injection for FI showed superior efficacy in women with remote h/o OASIs
  - >75% of women with a h/o OASIs had successful outcome with SNM for combined FI and UUI
  - Successful for most patients who fail conservative therapy: >80% had a <u>≥</u>50% reduction in FI episodes up to 14 years post-op

Rydningen et al Colorectal Dis 2017, Mellgren et al Dis Colon Rectum 2011

Case #2

<u>3 weeks later</u>:

- Perineum and pain somewhat improved
- Bowel symptoms still present
- Decision was made to proceed with surgical management

Case #2

<u>12 weeks postpartum</u>:

- Underwent transvaginal anal sphincteroplasty, posterior colporrhaphy, perineorrhaphy

<u>6 weeks post-op</u>:

- Excellent bowel control
- Well-healed

Pelvic Organ Prolapse (POP)

Case #3

- A 29 yo G1P1 presented 6 months after uncomplicated vaginal delivery over intact perineum for evaluation of defecatory dysfunction and vaginal bulge
- Started after her delivery. Endorses splinting and a sensation that stool is getting trapped in a pocket. Digitizes to empty. No constipation.
- Saw Ob/Gyn and completed course of PFPT, which didn't really help

Case #3

- On vaginal exam, she had posterior vaginal wall prolapse that came to the vaginal opening (stage 2 out of 4)
- On digital rectal exam: Distal rectocele with pocket, mild perineal body separation
- Desired surgical management of posterior vaginal wall prolapse given her significant defecatory dysfunction

Case #3

- Underwent uncomplicated posterior colporrhaphy with perineorrhaphy
- At her 6-week post-op visit, she reported complete resolution of all defecatory dysfunction

Pelvic Organ Prolapse

- Difficult to tease out contributions of vaginal birth, operative vaginal delivery, episiotomy & OASIs on future pelvic floor function
- Pelvic organ support defects can appear during pregnancy and before delivery
- With vaginal delivery, significant stretching of levator ani muscles can lead to both muscle and nerve stretch injury/damage

Lien et al, *Obstet Gynecol* 2004;
Dietz & Lanzrone, *Obstet Gynecol* 2005; Handa et al, *Obstet Gynecol* 2012

Pelvic Organ Prolapse

- Increasing parity and, to a lesser extent, larger babies are associated with increased risk for future POP and POP surgery
- In one study, multiple vaginal deliveries with perineal lacerations were associated with POP beyond the hymen (OR 2.34; 95% CI 1.13-4.86)
  - Overall impact of parity decreases after 2nd vaginal birth
- At 7.5 years from vaginal birth, 13% of women had POP on exam, but only 3% were symptomatic

Handa et al, Obstet Gynecol 2012; Rinne & Kirken 1999

Pelvic Organ Prolapse

- Women with a vaginal delivery had a 15-year cumulative POP incidence of 30%
- Operative vaginal delivery was associated higher HR than SVD (1.88, 95% CI 1.3-2.8)
- Increasing vaginal opening size (>3.5cm, also known as the genital hiatus) also associated with significantly elevated HR (9.0, 95%CI 1.7-5.3) for POP

Blomquist al, JAMA 2018

Pelvic Organ Prolapse

Management includes:

- **Expectant management: Education, reassurance**
- **PFPT**
- **Pessary**
- **Surgical management for those with persistent symptoms significantly impacting QOL**

Pelvic Organ Prolapse

If a patient elects surgical management, depending on what type of prolapse is involved, she can potentially have:

- **A uterine-sparing prolapse repair**
- **With or without mesh augmentation**

Patients likely have an increased risk of POP recurrence with subsequent pregnancy and delivery

Key Takeaways

- **Pregnancy and vaginal delivery are contributors to PFDs**
- **Postpartum PFDs are common and while for many symptoms initially experienced may resolve, for some, these symptoms persist when still present at 3 to 6 months postpartum**

Key Takeaways

- **There are many conservative treatments you can offer to postpartum patients such as:**
  - **Behavioral modifications**
  - **Pelvic floor physical therapy**
  - **Pessary or vaginal inserts**
  - **Medications (for women who are not breastfeeding)**

Key Takeaways

- **Pelvic floor physical therapists, obstetric providers and urogynecologists can be great resources for patients who are experiencing PFDs**
- **Patients do not need to complete childbearing to be eligible for surgical treatments, but they do need to have significant bother and impact on QOL**

Conclusions

- **Many patients do not know they have a pelvic floor, let alone what a pelvic floor disorder is**
- **Screening for PFDs is an important component of postpartum care (as many will not volunteer!)**
- **Educating patients that this isn't their new "normal" and there are providers who can offer effective treatments is key!**