Association of index finger palpatory assessment of pubovisceral muscle body integrity with MRI-documented tear
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Pelvic PT Distance Journal Club Aug 7, 2019

Introduction: The pubovisceral (PV) muscle is at high risk for stretch-related tears during vaginal birth due to a variety of factors.
Risk factors for levator injury (listed as inclusion criteria)
  • maternal age greater than 33yrs
  • stage 2 labor shorter than 30 min or longer than 150 minutes
  • weight of delivered infant greater than 4000gm
  • use of vacuum or forceps
  • 3rd or 4th degree anal sphincter laceration
The prevalence 13 % to 36% amongst women with a history of vaginal delivery, with higher in older women and those with more complex vaginal births.

Research paper on cadavers which showed little evidence of true tear (DeSilva)
PV m tears are identified as risk factors for POP (and possibly for UI)
There is currently little evidence as to whether women with a known PV tear will benefit from a PFMT.
Bo found no difference in results of PFMT between women with and without avulsion

Levator injury / avulsion / PV Muscle Tear: seen on MRI (or on ultrasound) by visible loss or discontinuity of m bulk. Complete tear is identified on MRI “as a full disruption of its origin at the pubic bone.”

Proposal from ICS working group on PFM assessment (in creation)

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<th>Levator injury/avulsion (PV): A discontinuity of the levator muscle at its attachment to the inferior pubic ramus. Discontinuity may represent a partial tear, full tear or thinning. Test for levator injury / avulsion: palpation of levator tissue, by placing finger(s) between the side of the urethra and the edge of the muscle measured on each side. The test is performed at rest and confirmed by asking the patient to contract and feeling for the edge of the contractile tissue of the levator muscle.</th>
<th>Absent = active PFM next to the urethra on the inferior pubic ramus Present: A distance of &gt; 3.5 finger widths between the two sides of puborectalis muscle insertion (Bo). Number of finger widths palpable in the gap Several rating scales exist (Dietz, van Delft).</th>
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Aim: “to determine the extent to which assessment of the PV muscle body integrity using index finger palpatory assessment at the muscle site where it passes the vaginal sidewall bilaterally is predictive of MRI results.”

Study Design: Longitudinal observational cohort study.
(EMRLD), Evaluating Maternal Recovery from Labor and Delivery, whose aim was to study post-vaginal birth recovery of the PV muscle. Data at 7 weeks gave a larger sample size.

**Study sample:**
Inclusion criteria - 18 yo and at least 1 risk factor for PV m tear
Exclusion criteria: See Figure 1. Final sample was 85 women.

**Methods:**
- “Finger palpatory assessment of PV muscle body integrity” OR test for levator injury.
  - Index finger placed mid-muscle body of PV m or about 2-cm inside the vagina, with finger curled to R/L toward vaginal sidewall and then lightly pressed into sidewall. Examiner could also sweep slightly up and down using finger pad to palpate for the fullness of the PV m body. If unable to palpate PV m, women cued to contract her PFM s and the finger assessment was repeated. Examiner evaluates status of PV m by determining the “degree of m bulk felt as continuous soft tissue resistance interposed between the lateral vaginal wall and the bony pubic rami.”
  - Scoring for each side separately:
    - PV mm “present” --- if body of mm could definitively be felt
    - PV mm “absent” --- if body of mm could not be felt, instead feeling indentation and/or feeling of hardness of pubic ramus
    - PV mm “equivocal” --- if examiner was unable to ascertain with confidence that the PV mm was either present of absent
  - Examiner was women’s health NP - represent the general women’s health care providers
- MRI assessment of PV mm: Examiner blinded
- Data management
  - Palpatory assessment: classified into four grades
    - 0=PV m present B
    - 1= equivocal unilat and present on contralateral side
    - 2= equivocal B or absent unilat
    - 3= absent B
  - MRI assessment: classified into four grades
    - None= no tear or subtle B tear
    - Grade I Tear= less than 50% unilat tear
    - Grade II Tear= 50% or greater unilat tear or less than 50% B tear
    - Grade III Tear= 50% or greater B tear
- Study used descriptive statistics and a proportional odds model

**Results**
- Descriptive characteristics (See Table 1): Average age of 85 participants in study was 29.3 years
- Palpatory assessment: 79% had absent or equivocal PV muscle
- MRI-documented PV m tear: 35% had PV tear with varying degrees of severity found.
- Bivariate proportional odds model (using palpatory assessment as an estimate of MRI-documented PV m tear severity): found on average, the odds of having a high-grade MRI documented tear category relative to a lower category, increased by 3.62 (95% CI=1.70-7.73, P=0.001) times for each grade increase in PV m tear assessed by finger palpation.
- "NP was a statistically significant estimator of PV m tear severity"
Discussion
- In 1943, Dr. Gainey index finger palpatory assessment to estimate the presence of PV m tear. His research identified 20% of primiparous women with absence of m (he defined this as a ‘tear’).
- van Delft - 96% inter examiner agreement that levator injury is present
- Dietz - Moderate agreement with US after substantial training
- Authors suggest that especially women who present with birth risk factors may benefit from a “simple, quick finger palpatory assessment to estimate any equivocal or absent PV m body.”
- It is currently unknown how levator injury relates to symptoms although it does seem to be related to POP, injury does appear to be related to weakness and decreased force
- PFM training may not be appropriate for a woman where the PV m could be torn from its origin.

Limitations to this study:
- Subjects were selected based on risk factors rather than symptoms of UI or POP so the value of the palpatory method for symptomatic women could not be explored.
- Researchers did not study interrater nor intrarater reliability
- the odds ratio was not adjusted for other confounding obstetric risk factors of PV m tear
- sample size was small.

Conclusion
Index finger palpatory assessment of PV m body can be used to estimate the odds of a postpartum PV m tear in a woman with known PV m tear risk. This information can be used for providers’ clinical problem solving and for establishing a more effective plan of care.

References

Bo K. Postpartum pelvic floor muscle training and pelvic organ prolapse—a randomized trial of primiparous women. Kari Bø, MSc, PhD, PT; Gunvor Hilde, MSc, PT; Jette Stær-Jensen, MD; Franziska Siafarikas, MD; Merete Kolberg Tennfjord, MSc, PT; Marie Ellstrøm Engh, PhD. Am J Obstet Gynecol 2015;212:38.e1-7.


Study questions
1. do you test for levator injury? how?
2. what does it mean if you find one? how do you change your treatment or prognosis?