

The Female Pelvic Floor: is your finger really doing the talking?

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Anatomy

Female Anatomy

- Superficial Layer
 - External anal sphincter
 - Subcutaneous
 - Superficial (only part of EAS attached to bone)
 - Deep (responsible for 30% of resting pressure)
 - Superficial transverse perineal muscle
 - Joint action with deep transverse perineii
 - Ischiocavernosus
 - Compresses clitoris, retards venous return and serves to erect the clitoris thereby enhancing sexual responses
 - Bulbocavernosus
 - Closes vagina, expresses secretions and compresses deep dorsal vein of clitoris

Pelvic Diaphragm

- **Pubovisceral muscle**
 - Pubococcygeus (proper)
 - Supports pelvic organs and compresses vagina and rectum
 - Pubovaginalis
 - Elevates the urethra
 - Puborectalis
 - Forms the anorectal angle / flap valve
- **Iliococcygeus**
 - Elevates rectum
- **Levator plate**
- **Ischiococcygeus**
 - Supports pelvic contents, assists stability of SU

Ligaments

- Anterior longitudinal ligament
- Iliolumbar ligament
- Sacroiliac ligament
- Sacrotuberous ligament
- Sacrospinous ligament
- Anterior sacrococcygeal ligaments
- Inferior (arcuate) pubic ligament
- Pubovesical ligament
- Sacrouterine ligament
- Cardinal ligament

Fascia

- **Arcus tendineus fascia pelvis**
 - Linear fascial thickening of obturator fascia
 - Attached anteriorly to pubic bone and posteriorly to ischial spine
 - Connection between iliococcygeus and endopelvic fascia

Important in continence mechanism

Fascia

- Endopelvic fascia
 - Surrounds vagina
 - Attaches laterally to ATFP
 - Thought to act as connection between bladder neck and urethra to ATFP

Fascia

- Umbilical prevesical fascia
- Transversalis fascia
- Vesicocervical fascia
- Superior fascia of pelvic diaphragm
- Iliac fascia
- Uterine fascia
- Rectal fascia
- Vaginorectal fascia

Fascia

- Obturator internus fascia
- Presacral fascia
- Pubocervical fascia
- Piriformis fascia
- Thoracolumbar fascia

The Downs and Ups!

Continence Mechanism
in the Female

Discreet Muscles

- Detrusor loop
- Pubovesical muscles
- Pubovisceral muscle (pubococcygeus)
 - Puborectalis
 - Pubovaginalis
- Perineal membrane
 - Compressor urethrae
 - Urethrovaginal sphincter
- Bulbospongiosus

Continence Mechanism

- Proximal urethra moves downwards and backwards
- Stretch resistance (stiffness) of pelvic floor muscles counteracts force
- Proximal urethra compressed against endopelvic fascia, vagina and levator ani

Assessing the Problem

Basic Muscle Assessment

- P performance
- E endurance
- R repetitions
- F fast
- E elevation
- C co-contraction
- T timing

Haslam J, Laycock J (Eds). Therapeutic Management of Incontinence and Pelvic Pain. 2nd Ed, 2008: Springer-Verlag, London.

Grading

- Modified Oxford Scale
- 0 - nothing
- 1 - flicker
- 2 - weak
- 3 - moderate
- 4 - good
- 5 - strong

Laycock J. Assessment and treatment of pelvic floor. PhD Thesis; University of Bradford 1992.

Grading

- Modified Oxford Scale (Laycock 2002)
- 0 - no discernible contraction
- 1 - flicker of movement or pulsation under examining finger
- 2 - weak contraction without lift or squeeze
- 3 - moderate contraction, lift of posterior wall and squeeze on finger
- 4 - good contraction, elevation of posterior wall against resistance
- 5 - strong contraction against strong resistance

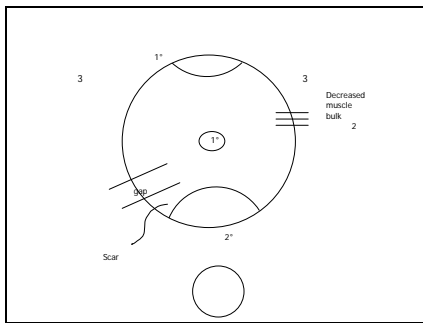
If we test muscle action against gravity is our recording mechanism the same?

Myotomes

- Quadriceps - L3
- Tibialis anterior - L4
- Extensor hallucis longus - L5
- Toe extensors - L5 & S1
- Calf - S1 & 2
- Toe flexors - S2
- Puborectalis - S2, 3, & 4
- EAS - S2, 3 & 4

Reflexes

- Knee jerk - L3
- Ankle jerk - S1 and S2
- Plantarflexor - S2
- EAS - S4



Latest Techniques

**Advanced Palpation and
Assessment**

**Improved Assessment
Techniques**

- How do I palpate
- What do I feel
- Am I right in my assumptions
- How do I record my findings
- What do I teach my patients
- Will I make any difference?????

Palpation

- Horizontal plane of palpation

- Vertical plane of palpation

- But the pelvis is a 'bowl'

- Which muscles are being palpated?

Palpation

- Horizontal plane
 - Coccyx
 - Posterior vaginal wall
 - Rectum and contents
 - Pubovisceralis
 - Puborectalis portion
 - Levator ani
 - ilioococcygeus

Palpation

- Vertical plane
 - Pubic bone
 - Urethra
 - Anterior vaginal wall
 - Pubovisceralis
 - Pubovaginalis portion
 - Pubococcygeus, anterior fibres

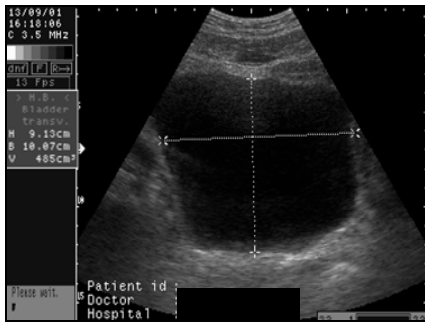
Dynamic Imaging

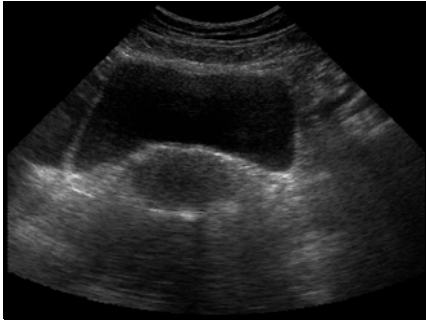
Application

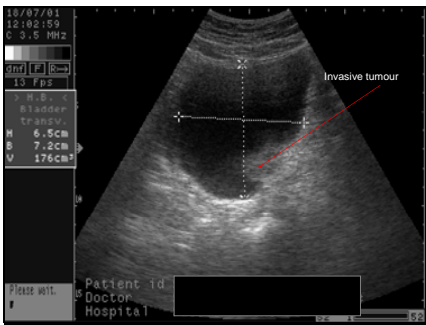
- Transabdominal
 - Simple bladder scanning
 - Confirmation of symmetry of PFM
 - Assessment of continence mechanism
 - Analysis of core stability
- Transperineal / Translabial
 - Confirmation of pelvic floor muscle activity
 - Assessment of continence mechanism

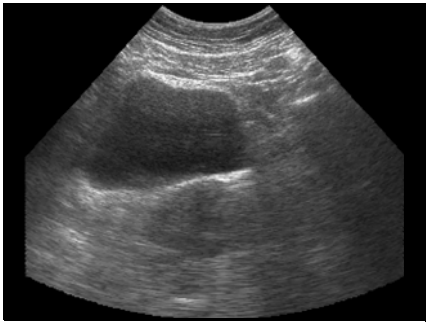
Transabdominal

- Simple bladder scanning
- Integrity of rectus abdominis
- Core stability











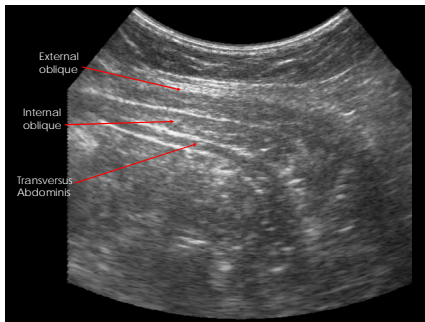
Cylinder of Stability

A pubococcygeal contraction can be facilitated by a transversus abdominis contraction

Richardson & Jull 1995 Muscle control – pain control. What exercises would you prescribe? Manual Therapy 1:2

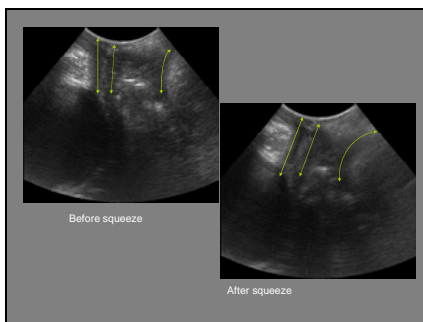
Activation of the abdominal muscles is a normal response to contraction of the pelvic floor muscles

Sapsford et al 2001 Co-activation of the abdominal and pelvic floor muscles during voluntary exercises. Neurorol & Urodyn 20:31



Transperineal / Translabial

- Continence Mechanism
- Pelvic Floor Muscle Activity



The Paperwork

Documentation

- How do you record your findings when palpating in two planes?
- Should we be simplifying the scoring?
- Should we be thinking gravity assisted, eliminated and resisted?
- How do you record specificity of muscle action?

It's just not that easy after all!

Oxford Classification

- 0 = No contraction
- 1 = Flicker of contraction
- 2 = Weak. Small movement with gravity counterbalanced
- 3 = Fair. Movement against gravity
- 4 = Good. Movement against gravity and some resistance
- 5 = Normal

ICS Classification

- 0 = No contraction
- 1 = Weak (Oxford 1&2)
- 2 = Good (Oxford 3&4)
- 3 = Strong (Oxford 5)

Advanced Assessment

- | | |
|--------------------|------------------------------------|
| • P performance | • S strength/stability/speed |
| • E endurance | • U urethral closure |
| • R repetitions | • B bladder neck mobility |
| • F fast | • T tone/timing (accuracy/control) |
| • E elevation | • L left/right symmetry |
| • C co-contraction | • E endurance at sub max level |
| • T timing | |

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