Prolapse Exam
TERMINOLOGY
PELVIC ORGAN PROLAPSE-
QUANTITATIVE
POP-Q
Figure 2.5  POP-Q. There are site points labeled Aa, Ba, C, D, Bp, and Ap that correspond to points above or below the hymeneal remnants and are stated in centimeters above (negative) or below (positive) that point. The genital hiatus (gh), perineal body (pb), and total vaginal length (tvl) are also listed as lengths in centimeters. They are used to quantify pelvic organ support anatomy. (From: Bump RC, Mattiasson A, Bo K, et al. The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. Am J Obstet Gynecol. 1996;175:12, with permission.)
FIGURE 25.4  (A) Grid and line diagram of complete eversion of vagina. Most distal point of anterior wall (point Ba), vaginal cuff scar (point C), and most distal point of the posterior wall (point Bp) are at same position (+8), and points Aa and Ap are maximally distal (both at +3). Because total vaginal length equals maximum protrusion, this is stage IV prolapse. (B) Normal support. Points Aa and Ba and points Ap and Bp are all -3 because there is no anterior or posterior wall descent. Lowest point of the cervix is 8 cm above hymen (-8) and posterior fornix is 2 cm above this (-10). Vaginal length is 10 cm, genital hiatus and perineal body measure 2 and 3 cm, respectively. This represents stage 0 support. (From Bump RC, Mattiasson A, Bø K, et al. The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. Am J Obstet Gynecol 1996;175:10–17, with permission.)
Concepts of Pelvic Support

- **Primary support** is pelvic floor muscles
  - Injured with childbirth
  - Atrophy with age (disuse, hormonal, neurologic)
  - Cannot restore surgically
- **Secondary support** is visceral “fascia” (fibromuscular connective tissues)
  - What we use surgically to re-support
Ship in the dock analogy

Ship = pelvic organs (viscera)
Water = muscle support
Tethers = connective tissue support
Ship = pelvic organs (viscera)
Water = muscle support
Tethers = connective tissue support

Loss of muscle support will lead to stretch or breakage of the tethers.
Concept of muscle support

- Sagittal view
- Transverse view
Concept of muscle support
effect of muscle loss

• Viscera through primary muscle support

• Loss of pelvic floor muscle
Supports of the Pelvic Viscera

**TERMINOLOGY**

- **“Fascia”** (true fascia is not visceral, in pelvis is fibromuscular connective tissue)
  - Parietal fascial- invests striated muscle connecting muscle to bone and anchor points of visceral connective tissues
    - ATLA, ATFP (white line)
  - Visceral fascia- existence questionable and controversial. “endopelvic fascia”
    - Loose collagen, elastin, areolar, vascular, fatty tissue that allows expansion-contraction and is intimately associated with the pelvic visceral structures.
  - Pubocervical, pubovaginal, rectovaginal “fascia”

- **“Ligaments”** (are not bone to bone) = fibromuscular connective tissue variable in composition and function
  - Sacrospinous, sacrotuberous, anterior longitudinal -dense connective tissue joining pelvic bony tissue
  - Broad ligament, Cardinal ligament- loose areolar tissue, blood vessel mesentery
  - Iliopectineal (Cooper) ligament
    - Thickening of periosteum of pubic bone
  - Uterosacral ligaments (smooth muscle, autonomic nerves)
  - Round ligaments (smooth muscle,fibrous)
SUBDIVISIONS OF LEVATOR ANI MUSCLES
Pubococcygeus
Puborectalis
Iliococcygeus
“Maybe we should write that spot down.”
DeLancey Levels of Support

Ischial spine & sacrospinous ligament

Level I

Level II

Levator ani

Pubocervical fascia

Rectovaginal fascia
Summary of pelvic organ support
DeLancey Levels

• Level I – Apical (cervix and proximal vagina)
  – Uterosacral ligaments
  – Normal is at the level of the ischial spines

• Level II- Mid-vagina
  – Pubocervical fascia anterior
  – Rectovaginal fascia posterior
  – Connections are lateral to the ATFP

• Level III- Distal vagina (urethra, ano-rectal)
  – Perineal body, perineal muscles, dense fibromuscular connective tissue, NO distinct tissue plane / avascular space
Shown is the atrophied mesonephric duct (Wolff) (4) that, however, leaves certain embryonic remnants behind. Out of the paramesonephric duct (Müller) (5) arise on both sides the fallopian tubes and through fusion of both sides the uterus and the upper part of the vagina (blue). The lower part of the vagina (yellow) comes from the urogenital sinus (endoderm). To be noted is also the development of the ligaments and the hymen (6), the middle part of which usually disintegrates at around the time of birth.
DeLancey Stage of Prolapse?
What DeLancey levels are deficient (unsupported)?
urothelium
Detrusor muscle
Vesico-vaginal space
adventitia
Vaginal muscularis
Vaginal epithelium
lateral sulcus of the vagina
SMOOTH MUSCLE > COLLAGEN > ELASTIN

“PUBOCERVICAL FASCIA”
Pelvic Viscera of Female
Superior View - with peritoneum and uterus removed
“Stimulus, response! Stimulus, response! Don’t you ever think.”
MAIN POINT: >50% of anterior vaginal wall support comes from the apex.
Anterior Vaginal Compartment Anatomy

• Central
  – Epithelium, muscularis, adventitia, vesico-vaginal space, bladder adventitia, bladder muscularis, bladder epithelium

• Lateral
  – Fibrous connection to ATFP (endopelvic fascia, fascia endopelvina)

• Proximal (superior)
  – Well defined avascular plane (vesico-vaginal space)

• Distal (inferior)
  – No well defined avascular plane (embryologically different)
From Baggish & Karram
Brief Interlude for interactive anatomy
Apical (DeLancey Level 1) support is:

1. provided by the uterosacral ligament attachments to the cervix and superior vagina
2. normal if the cervix resides at the level of the ischial spine
3. May be surgically corrected with a sacrospinous ligament fixation (colpopexy)
4. May be surgically corrected with a uterosacral ligament colposuspension (colpopexy)
5. all the above
DeLancey Level 2 support:

1. is provided by lateral attachments from the lateral mid-vaginal wall to the ATFP
2. Level 2 support is lost with paravaginal support defects
3. is surgically corrected only with anterior colporrhaphy
4. all of the above
5. none of the above
6. 1+2
Posterior Vaginal Compartment Anatomy

- Similar to anterior
- Fibromuscular wall (rectovaginal septum distally)
- Distal attachment to perineal body
- Lateral attachment to arcus tendineous rectovaginalis (distal)
- Proximal (upper) attachment to pericervical USL
What are the operations for Level I support?
Advanced anterior vaginal wall prolapse is highly correlated with apical prolapse  Rooney, Kenton, et al

• Recurrent vaginal prolapse- cause remains controversial
• Difficult to differentiate persistence from recurrence
• 325 women cohort
  – Anterior prolapse occurred more frequently than apical or posterior
  – Strong linear correlation between Points C and Ba
  – Not affected by history of hysterectomy
  – Higher stage anterior prolapse more likely to have had hysterectomy
• Conclusion: Anterior vaginal wall prolapse is associated strongly with apical prolapse. Anterior vaginal wall defects that are surgically repaired usually require a concomitant repair of the apex.
Outcomes of Vaginal Prolapse Surgery Among Female Medicare Beneficiaries- The Role of Apical Support
*Obstet and Gynecol* Vol 122, NO. 5, November 2013

- 10 yr f/u of 2756 women ant colporrhaphy, post colporrhaphy, or both w/ or w/o apical suspension
- Reoperation rate twice as high for women who had isolated anterior colporrhaphy vs women who had anterior colporrhaphy with apical suspension procedure (20.2% vs 11.6%).
What are the procedures for Level II support

• 1.
• 2.
• 3.
FIGURE 47  Anatomy surrounding the CSSL.
Before paper and scissors

Dang! Tied again!
Ready...one, two, three!
Surgical NeuroVascular Anatomy

• 1. What critical neuro vascular structures are you most concerned with performing a SSLF (sacrospinous ligament apical suspension)?

• 2. What critical neurovascular structures are you most concerned about when performing a retropubic urethropexy (MMK, Burch)?

• 3. What vascular structure are you most concerned about when dissecting the presacral space for sacrocolpopexy?
Pubo-rectalis muscle