Pelvic Support Defects and Treatments

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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 concept
Ship= pelvic organs (viscera)
Water= muscle support
Tethers= connective tissue support
Pelvic Floor Muscle
ANATOMY
Concept of muscle support

• Lateral view
• Sagittal view
Concept of muscle support
effect of muscle loss

• Viscera through primary muscle support

• Loss of pelvic floor muscle
Loss of muscle support will lead to stretch or breakage of the tethers.
Recommend that terminology describing vaginal tissue as fascia be abandoned.

Term fascia should be reserved for the parietal fascia, which corresponds to established anatomic and histologic definitions (obturator fascia).

“Vaginal wall or muscularis” instead of “pubocervical fascia”

Endopelvic fascia describes the subperitoneal and perivascular connective tissue and loose areolar tissue that exist throughout the pelvis, around and between the pelvic organs.
SMOOTH MUSCLE > COLLAGEN > ELASTIN

"PUBOCERVICAL FASCIA"
DeLancey Levels of Support
FIGURE 7. Integrated levels of support: illustration of the normal vaginal axis and the three levels of support of the vagina and uterus from the perspective of a standing woman. In level I, the endopelvic fascia suspends the upper vagina and cervix from the lateral pelvic walls. Flaps of level I extend both vertically and posteriorly toward the sacrum. In level II, the vagina is attached to the arcus tendineus fasciae pelvis and superior fascia of the levator ani muscles. In level III, the distal vagina is supported by the perineal membrane and muscles. The insets show transverse sections made through the vagina perpendicular to the normal vaginal axis at each level.
Summary of pelvic organ support

• 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
“Stimulus, response! Stimulus, response! Don’t you ever think.”
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 (upper)
  – Well defined avascular plane (vesico-vaginal space)

• Distal (lower)
  – No well defined avascular plane (embryologically different)
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
Prolapse of the Vaginal Apex
Definitions/Terminology/Synonyms

- Vaginal apex / apical segment
- Central compartment
- Superior segment
- Vaginal vault prolapse (post hysterectomy)
- + Point C / D (POPQ) (beyond the hymen)
- Loss of Level I support (DeLancey 1992)
- Cervical prolapse
- Procidentia / vaginal vault prolapse / enterocele
Concerning Anatomy, Which of the following are true?

• A. Cervical prolapse extending beyond the hymen is an example of DeLancey level I defect
• B. The vaginal wall is histologically comprised of mucosa, muscularis, and advential layers
• C. There are no distinct avascular planes surrounding the distal third of the vagina due to it’s embryologic derivation
• D. The levator ani muscles are secondary supports compared to the pubocervical “fascia” (connective tissue)
• E. A and C are true
Dang! Tied again! Ready... one, two, three!

Before paper and scissors
Surgical Correction of Utero-Vaginal Prolapse

- Native tissue vs. graft augmented
- Approaches
  - Trans-vaginal
  - Trans-abdominal
- Categorization
  - **Reconstructive** (restorative)
    - USL colposuspension, SSL fixation
  - **Compensatory**
    - Sacrocolpopexy, Sacrohysteropexy, Sacrocervicopexy
  - **Obliterative**
    - Colpectomy, Colpocleisis
Surgical Correction of Utero-Vaginal Prolapse

• Compartment Repair
  – Anterior
  – Posterior
  – Apical
Anterior Vaginal Segment Prolapse
CYSTOCELE

• MOST COMMON SINGLE SITE OF PROLAPSE – 33% PREVALENCE
• HIGH INCIDENCE OF RECURRENCE AFTER PRIMARY REPAIR (30-50%)
• CAUSE NOT UNDERSTOOD-MULTIFACTORIAL
• DIFFERENT APPEARANCES & NO GOLD STANDARD REPAIR
Anterior vaginal compartment defects

- Are not easy to understand or to repair
  - Anterior is most common site of vaginal prolapse
  - High incidence of recurrence after repair (30-50%)
  - More than 50% of anterior support is from apical support
- May result from attenuation, tears, or both in the fibromuscular vaginal wall from various sites (proximal, lateral)
- Surgical repairs-tailor to the patient
Full thickness

Split thickness

Split and imbricate
With permanent suture
Anterior compartment repair

- Subjective cure is higher than anatomic cure
- Anterior colporrhaphy (AC) alone has high failure rate 30-70%-- depending on definition
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%).

• 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.
Posterior Compartment repair
Similar to anterior

• Higher success than anterior
• Recurrence risk up to 18%
• De novo dyspareunia up to 18%
• Site specific vs muscle splitting vs levatorplasty
• MESH (synthetic or biograft) DO NOT improve outcomes.
• Improves abnormal defecation in 2/3
Use of uterosacral ligaments for vaginal apical reattachment

INTRA-PERITONEAL COLPOPEXY
High USL colposuspension / McCall cul de plasty

• Advantages
  • Less dissection
  • Restores natural upper vaginal axis
  • Less risk/morbidity than other vaginal procedures?
  • Just as efficacious as SSLF

• Disadvantages
  • May not be able to identify adequate ligaments
  • Cystoscopy required- ureteral obstruct /injury 2%
Sacrospinous Ligament Suspension (fixation)
EXTRA-PERITONEAL COLPOPEXY

• Attaches vaginal apex to sacrospinous ligament / coccygeus muscle complex
• Unilateral (traditional) or bilateral (preferable)
• Permanent suture (delayed absorbable?)
• Access usually via posterior dissection-pararectal space, can be done via anterior dissection (blind application)
• Risks-bleeding, nerve injury, gluteal pain
Which of the following are true concerning surgery for utero-vaginal prolapse?

• A. Hysterectomy is nearly always required to eliminate the weight (force) of the uterus on the vagina
• B. For “cystocele” repair, anterior colporrhaphy has the highest success of all supportive procedures and would rarely need a concomitant apical suspension procedure.
• C. Hysterectomy cures uterine prolapse
• D. May be corrected by intra or extra peritoneal colpopexy
The abdominal sacral colpopexy:

- Uses synthetic graft material
- Dissection avoids opening of the vaginal wall
- Requires precise dissection of the presacral space to avoid serious complications
- Mesh to cover large surface area of vagina with multiple attachment points (dissection in vesico-vaginal space, rectovaginal space, presacral space)
Sacrococlopexy - INDICATIONS

- Preserve vagina
- Preserve sexual function (shortened vagina)
- Previous vaginal repair failure
- Vagina scarred / retracted
- Need Retropubic urethropexy (MMK-Burch)
- Neurogenic / Genetic basis for POP
Deviation of vaginal axis due to surgical repair
SCP, RPU, USLS, SSLS
OBLITERATIVE PROCEDURES

LeFort colpopleisis
Colpectomy
Vaginal Obliterative Procedures

• Indications
  – No future desire for vaginal intercourse
  – Poor surgical risk for major operation / anesthesia
  – Unable to retain pessary

• Advantages
  – Quick
  – Less bleeding
  – Highly effective (if done properly)

• Disadvantages
  – Unable to assess AUB w/ LeFort
  – May require bladder neck support or MUS
Which of the following are true?

• A. Sacrocolpopexy has approximately a 6% risk of mesh erosion / exposure into the vagina
• B. LeFort colpocleisis is contraindicated in a woman desiring to preserve vaginal function
• C. Sacrocolpopexy deviates the vaginal axis more anterior to it’s normal position
• D. Sacrocolpopexy carries risk of serious hemorrhage from the left common iliac vein, presacral/hypogastic veins, and presacral vessels.
• E. All above are true.
The pelvic surgeon ideally is.....

• “… trained and prepared to perform a variety of operative techniques and to tailor the operation to the needs of the patient, rather than making all patients conform to his or her own specific skills.”

• Shull Am J Obstet Gynecol 1999 181:6-11