Evaluation of urinary incontinence and prolapse: an evidence-based critique

Tyler Muffly, M.D.
Division of Female Pelvic Medicine & Reconstructive Surgery
Assistant Professor, Ob/Gyn
University of Colorado Anschutz Medical Center

Objectives

- At the conclusion of this lecture, participants should be able to:
  1. Review epidemiology of incontinence and prolapse
  2. Summarize office evaluation techniques and appraise evidence of their utility
  3. Evaluate validity of urodynamic testing

Disclosures

- None

Pelvic Organ Prolapse
Pelvic Organ Prolapse
Pelvic Organ Prolapse

Urinary Incontinence - Prevalent and Costly

- Affects >17 million people
- Total annual costs over $26 billion in patients >65
  - $3600 annually per person
- Significantly impacts QOL
  - Mental health
  - Physical functioning
  - Social functioning
- 20-40% of women in mid-life and beyond have some incontinence

Pelvic Organ Prolapse - Background

- 16% of women in US have prolapse
  - Pannu et al, Radiographics 2000;20(6):1567-82
- Lifetime prevalence 30-50%, of which 2% symptomatic
  - Samuelsson EC et al, AJOG 1999;180:299-305
- 7% lifetime risk of surgery for prolapse
  - Olsen et al., Obstet Gynecol 1997;89:501
- 29% require re-operation
  - Olsen et al., Obstet Gynecol 1997;89:501

**Lifetime Risk of Single Operation for POP/UI**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-39</td>
<td>0.9%</td>
</tr>
<tr>
<td>40-49</td>
<td>2.8%</td>
</tr>
<tr>
<td>50-59</td>
<td>4.7%</td>
</tr>
<tr>
<td>60-69</td>
<td>7.5%</td>
</tr>
<tr>
<td>70-79</td>
<td>11.1%</td>
</tr>
</tbody>
</table>

*Olsen et al., Obstet Gynecol 1997;89:501*

**Available assessments**
- H+P
- Voiding diary
- Post-void residual
- Urine culture
- Stress test
- Q-tip test
- Uroflow
- Single channel cystometrogram
- Multichannel urodynamics
- Cystoscopy

**Evaluation**
- Match symptoms to signs
- Treat symptoms
  - Pay attention to what bothers patient most!

**Female incontinence made simple**

<table>
<thead>
<tr>
<th>Stress</th>
<th>Urge</th>
<th>Mixed</th>
<th>Overflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td>Urgency</td>
<td>Stress + urge</td>
<td>Hesitancy</td>
</tr>
<tr>
<td>Sneeze</td>
<td>Frequency</td>
<td>Which worse?</td>
<td>Interrupted flow</td>
</tr>
<tr>
<td>Laugh</td>
<td>Nocturia</td>
<td></td>
<td>Poor stream</td>
</tr>
<tr>
<td>Exercise</td>
<td>Dysuria</td>
<td></td>
<td>Incomplete void</td>
</tr>
<tr>
<td>Position change</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**History**
- Focus on main symptom
  - Length of problem
  - What makes her leak?
  - # of pads / day
  - # of incontinent episodes
- QoL impact
  - Use validated tools
- Hormonal status
- Prior surgery
- Neuro disorders
- Medications
- Other symptoms

**Myths of SUI**
- This is a normal part of aging
- SUI is hereditary – “my Mom had it”
- SUI is not an important health problem
- My symptoms will get better on their own
- My problems are from childbirth…or hysterectomy
- There is no treatment
- This is too embarrassing to talk about with my doctor

**Stress Urinary Incontinence Risk Factors**
- Age
- Pregnancy
- Vaginal delivery
- Obesity/BMI
- Hysterectomy
- Physical activity
- Smoking
- Family history
- Diet
- Other medical conditions

**Problem**
Why is "History" not enough?

- Bladder is poor historian
  - In diagnosis of urodynamic SI
    - Sensitivity 0.82
    - Specificity 0.57
  - In diagnosis of detrusor overactivity
    - Sensitivity 0.69
    - Specificity 0.60
  - In diagnosis of mixed incontinence
    - Sensitivity 0.51
    - Specificity 0.66


Voiding Diary

- Intake
  - Type of fluids
  - Amount of fluids
- Output
- Frequency of urination
  - Day (frequency > 8 voids/day)
  - Night (nocturia > 0 voids/night)
- Activities associate with incontinence
- Insensible loss

Intake
- Type of fluids
- Amount of fluids

Output
- Frequency of urination
  - Day (frequency > 8 voids/day)
  - Night (nocturia > 1 voids/night)
- Activities associate with incontinence

3-Day Voiding Diary

- Intake
  - Type of fluids
  - Amount of fluids
- Output
- Frequency of urination
  - Day (frequency > 8 voids/day)
  - Night (nocturia > 0 voids/night)
- Activities associate with incontinence

Intake
- Type of fluids
- Amount of fluids

Output
- Frequency of urination
  - Day (frequency > 8 voids/day)
  - Night (nocturia > 1 voids/night)
- Activities associate with incontinence
Physical Examination

- Estrogen status
- Screening neuro exam
  - Strength / reflexes
  - S2-4 dermatomes
  - Bulbocavernosus and anal wink reflexes
  - Levator ani strength
- Anatomical defects resting and straining
- POP-Q

Pelvic Organ Prolapse

- Uterine prolapse
- Anterior vaginal prolapse
- Vaginal vault prolapse

Pelvic Organ Prolapse Quantification System (POP-Q)

- Adopted by ICS, AUGS and SGS
- Objective, site-specific system
  - Documenting
  - Comparing
  - Communicating
- Allows for:
  - Precise description of pelvic support without assigning severity value
  - Accurate observation of stability or progression of prolapse over time by same or different observers
**POP-Q Staging**

- **Stage 0 normal**
- **Stage I**
  - \(< -1\) cm from (above) hymen
- **Stage II**
  - \( \pm 1\) cm from hymen
- **Stage III-IV**
  - \(> +1\) cm to complete prolapse

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Normal, Points A, B, C, D, and E are all ( \leq -1) cm</td>
</tr>
<tr>
<td>I</td>
<td>Either Point C or D is at ( \leq (X - 2)) cm</td>
</tr>
<tr>
<td>II</td>
<td>The criteria for Stage 0 are not met and the leading edge of prolapse is ( 0 &lt; -1) cm</td>
</tr>
<tr>
<td>III</td>
<td>Leading edge of prolapse is ( &gt; +1) cm but ( \leq (X-2)) cm</td>
</tr>
<tr>
<td>IV</td>
<td>Leading edge of prolapse is ( &gt; (X-2)) cm</td>
</tr>
</tbody>
</table>

\( X = \) Total Vaginal Length in centimeters in Stages 0, II, and IV

Stages I through IV can be subgrouped according to which portion of the lower reproductive tract is the leading edge of the prolapse using the following qualifiers: A = anterior vaginal wall, P = posterior vaginal wall, C = vaginal cuff, C = cervix, and A, B, C, and D for the defined points of measurement, e.g., IV-C, I-A, or II-BP.

**Cough Stress Test (CST)**

- **Observation of leakage on coughing**
  - 92% sensitivity
  - 56% specificity
  - 62% PPV
  - 89% NPV

Weidner 2001
**Postvoid residual (PVR)**
- Consensus is that PVR <50cc normal
- AHCPR recommends multichannel urodynamics for >100cc
- Most experts consider >200cc definitely abnormal

**Q-tip Test**
- Documents urethral hypermobility
- Most consider >30° change positive
  - Sensitivity for USI – 80%
  - Specificity for USI – 42%
- Fixed urethra concern for surgical failure
- “Eyeball” vs measured
- Not predictive of outcome

**Urodynamic Testing**
- “Eyeball” cystometry
  - Detects detrusor contractions and compliance, residual urine, and determines bladder capacity
- Cystometrogram (CMG)
  - Measures pressure/volume relationships within bladder
Simple Cystometry

- Timed, measured void
- Catheterized PVR
- Urinalysis
- First sensation
- Bladder capacity
- OAB provocation
- Cough stress test

Equipment for Simple Cystometry

- 500cc sterile saline (body temp)
- Foley catheter
- 60cc Foley tipped syringe
- Stop watch
- “Hat” insert for commode

Simple Cystometry

- 92% concordance of history + simple cystometry vs multichannel UDS\(^1\)
- Bergman (1989) found simple cystometry sufficient to establish diagnosis in 75-80% of patients

Single Channel Cystometrogram

- Measures pressure/volume relationship of bladder during filling
- Assesses
  - Detrusor activity
  - Sensation
  - Capacity
  - Compliance
  - DO vs USI

Multichannel Urodynamics (UDS)

- Uses instruments to measure and display physiologic functions of lower urinary tract
- Pressure catheter in bladder and vagina or rectum
- $P_{det}$ calculated

Urodynamic testing vs clinical symptoms

- Sensitivity of UDS vs clinical history
  - Stress incontinence – 0.80-0.91
    - 1316 pts [6 studies]
  - Urge incontinence – 0.45-0.72
    - 870 pts [4 studies]
  - Mixed incontinence – 0.20-0.45
    - 649 pts [4 studies]
- 10% with urinary symptoms have normal CMG
- 18-61% of normals have abnormal CMG

Colli, Eur Urol, 2003
**Multichannel UDS: reliability and agreement among physicians**

- 100 UDS reviewed by 3 urogyns and 3 urologists
  - Review repeated after 4 mos
- Intra- and interobserver reliability calculated
  - SUI
    - Good reliability and interobserver agreement
  - DO with or without incontinence
    - Moderate reliability, fair interobserver agreement
  - Voiding dysfunction
    - Moderate reliability, fair interobserver agreement


**Indications for multichannel urodynamics**

- Uncertain diagnosis
  - Findings don’t match complaint
- Complex history
- Previous surgery
- Patient not satisfied with initial treatment
- Surgery planned in a complicated patient
- Comorbid conditions

Expert opinion

**Are urodynamics really necessary?**

- Probably not always……
- Cost analysis of basic office evaluation vs urodynamics for women with prolapse and stress incontinence
  - Basic office evaluation and multichannel UDS had same cure rate of incontinence (96%)
  - If surgery is preferred treatment, then urodynamic testing not cost-effective

Weber AM and Walters M, AJOG 2000

**Algorithm for Urinary Incontinence Evaluation**

[Diagram showing decision-making process for urinary incontinence evaluation]
Summary

Incontinence Summary
- EPIC template for incontinence questions: .pelvicfloor
- Complete a 3-day bladder diary and have it scanned into EPIC
- Perform a cough stress test on exam
- Explain that the patient will likely need bladder testing/UDS
- SUI at 3 months postpartum send the patient to urogyn ASAP

Prolapse Summary
- EPIC template for prolapse questions: .pelvicfloor
- Have the patient bear down like they are having a bowel movement or a baby
- Measure most distal point from the hymen

Summary
- Match symptoms to signs of incontinence
- Obtain thorough H+P
  - Post-void residual, diary, cough stress test, and pelvic examination
- Treat symptoms and determine what is most important to patient
- Urodynamics if:
  - Unsure of incontinence type
  - Symptoms and signs do not match
  - Prior surgery
  - If results will change management
Tyler Muffly, MD

Contact

- Get out your cell phones!
  - Tyler Muffly, MD
  - 720-810-9863
  - tyler.muffly@ucdenver.edu

- Same Day Appointments

- EPIC: “Ambulatory referral to urogynecology”