Urinary Incontinence and Pelvic Organ Prolapse

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Bladder Function
UI & VD

Sexual Constellation of physical finding and symptoms

Bowel Function
FI & DD

POP

Pelvic Floor Disorders

Prevalence of POP or PFD in Noninstitutionalized U.S. Pop

Pelvic floor disorders affect a substantial proportion of women

Nygaard et al. Pelvic Floor Disorders Network. JAMA. 2008 Sep 17;300(11):1311-6

Prevalence of POP or PFD in Noninstitutionalized U.S. Pop, Impact of Age

Nygaard et al. Pelvic Floor Disorders Network. JAMA. 2008 Sep 17;300(11):1311-6
Prevalence of >1 PFD in Noninstitutionalized U.S. Pop., Impact of Weight

Nygard et al. Pelvic Floor Disorders Network. JAMA. 2008 Sep 17;300(11):1311-6

Impact of POP/PFDs

- >200,000 surgeries performed for POP or UI each year in the U.S.
  - Projected 45% increase in next 30 years

- Cost exceeds 1 billion dollars/year

- Untreated symptomatic POP/PFD have a significant negative impact on QoL

Surgery for POP and UI

Olson et al, Obstet Gynecol 1997;89:501

PFDs Significantly Impact QoL

<table>
<thead>
<tr>
<th>QoL Indicator</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Limited activities</td>
</tr>
<tr>
<td>Social</td>
<td>Isolation</td>
</tr>
<tr>
<td>Sexual</td>
<td>Avoidance</td>
</tr>
<tr>
<td>Psychological</td>
<td>Depression, Loss</td>
</tr>
<tr>
<td>Occupational</td>
<td></td>
</tr>
<tr>
<td>Domestic</td>
<td></td>
</tr>
</tbody>
</table>

Majority of surgical and nonsurgical treatments of PFD's demonstrate significant improvement in QoL
Urinary Incontinence

- Involuntary leakage
- A condition that affects more than 10 million Americans.
- Less than 50% of incontinent women seek care—under-reported.
- Direct financial costs of over $15 billion.
- Only a fraction spent for diagnosis and treatment.

Urinary Incontinence Prevalence Rates by Age and Gender

![Graph showing prevalence rates by age and gender.]


Urinary Incontinence Is More Prevalent than Other Chronic Conditions in Women

- UI not life-threatening, but QoL issue

![Bar chart showing prevalence of UI compared to other conditions.]

4. NIDDK. Electronic Citation; 2001.

Risk Factors for Urinary Incontinence

- Obese
- High
- Personal
- Stress
- UI

![Diagram illustrating risk factors for UI.]

black outs with video of woman; gender, race
hhubbard, 6/6/2002
Office Evaluation of Urinary Incontinence (History)

Urologic Symptoms

- Stress incontinence
- Urge incontinence
- Frequency
- Nocturia
- Enuresis
- Dysuria
- Difficulty voiding
- Post-void fullness
- Post-void dribbling
- Hematuria

**TABLE 5-1** Medications that can affect lower urinary tract function

<table>
<thead>
<tr>
<th>Type of medication</th>
<th>Lower urinary tract effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diuretics</td>
<td>Polyuria, frequency, urgency</td>
</tr>
<tr>
<td>Anticholinergic agents</td>
<td>Urinary retention, over-flow incontinence</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Sedation, impaired mobility, disorders</td>
</tr>
<tr>
<td>Psychotropic agents, antidepressants</td>
<td>Anticholinergic actions, sedation</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>Anticholinergic actions, sedation</td>
</tr>
<tr>
<td>Opioids/hypnotics</td>
<td>Sedation, muscle relaxation, confusion</td>
</tr>
<tr>
<td>Alpha-adrenergic blockers</td>
<td>Stress incontinence</td>
</tr>
<tr>
<td>Alpha-adrenergic agonists</td>
<td>Urinary retention</td>
</tr>
<tr>
<td>Beta-adrenergic agonists</td>
<td>Urinary retention</td>
</tr>
<tr>
<td>Calcium-channel blockers</td>
<td>Urinary retention, over-flow incontinence</td>
</tr>
</tbody>
</table>

Consultation for Evaluation of Lower Urinary Tract Dysfunction

- Persistent UTI following tx
- Abnormal neurologic function
- Signs of voiding dysfunction or retention
- Absent sensation
- Large bladder capacity
- Elevated post-void residual

Walters MD et al J Am Board Fam Pract 1992;5:289
Urinary Incontinence Symptoms/Dx

<table>
<thead>
<tr>
<th>Symptom/Dx</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>Leakage with physical exertion or on sneezing or coughing</td>
</tr>
<tr>
<td>Urge</td>
<td>Leakage with a strong and urgent desire to void</td>
</tr>
<tr>
<td>Mixed</td>
<td>Combination of stress and urge</td>
</tr>
</tbody>
</table>

Other Causes of Accidental Urine Loss

Symptoms:
- Overflow
  - Frequency & Urge Inc
- Functional
- Ectopic ureter*
  - Continuous & Insensitive
- Fistula*
  - high volume UI
- Urethral diverticulum*
  - Post void dribbling & dyspareunia

*less common.

Voiding Diary Verses Fluid Intake / Output Diary

Q-tip Test

Hypermobile > 30 degrees
Cystometry

- Pressure-volume relationship of the bladder to filling
- Main diagnostic value to assess stress incontinence and detrusor overactivity
- Improvement of sensitivity with:
  - Maximum capacity
  - Patient standing
  - Detrusor-provoking maneuvers

Technique

- Fill with normal saline
- Bladder pressure (Pves) monitored
- Standing patient valsalvas
- Pves at which leakage occurs = aLPP

Variables: catheter size, volume, patient position, vaginal prolapse, radiographic vs. visual

Terminology

- Detrusor overactivity
  - “urodynamic” definition
- Urge incontinence
  - sensory
  - motor
  - hyperreflexia
Uroflow
• Depicts urinary flow rate and pattern

Pressure flow study
• Identifies bladder outlet obstruction
• $P_{det} = P_{abd} - P_{ves}$
• No diagnostic cut off to identify obstruction in women
  ($P_{det} < 40$ cm water, max flow rate $>15$)

Sphincter EMG
• Evaluates sphincter control and coordination (DSD)
• Does not identify neuropathy

Video urodynamics
• DSD
• Vesicoureteral reflux
• Outlet obstruction
• Associated pathology

Treatment Options for SUI

- Nonsurgical
  - Weight reduction if obese
  - Pelvic Floor Muscle Training*
  - Incontinence Pessary
  - SRI (Duloxetine)?

- Surgical*
  - Minimally invasive outpatient procedures
    • TVT/TOT
    • Urethral bulking
  - Most accepted Rx modalities

Pelvic Floor Muscle Training

1. Experienced Pelvic Floor Physical Therapist
2. Motivated Patient
SUI Pessaries

Medical Management of OAB

- Anticholinergics/Antimuscarinics

  - Results:
    - 70 - 90% improvement in symptoms
    - 20 - 40% completely continent

  - Flexible dosing regimens and side-effects

Management of OAB

1st Tier
- Behavioral Rx
  - Fluid & caffeine modulation
  - Bladder retraining/PFMT

2nd Tier
- Intravesical Botox

3rd Tier
- Neuromodulation
  - Sacral N.
  - Peripheral N.

- Augmentation Cystoplasty
- Urinary conduit or continent diversion

What are the anti-cholinergic side-effects?

- Dry mouth*
- Constipation*
- Blurred vision
- Anhidrosis
- Elderly – confusion, sleep disturbance, dizziness & increase risk of fall

*Most common
Contraindications for Anticholinergic Rx of OAB
- Uncontrolled narrow angle glaucoma
- Significant PVR (unless supplemented with CISC)
- Gastric retention
- Hypersensitivity to any of formulations
- Caution in patients with renal or hepatic impairment

Long Term Use of Anticholinergics given for Urge Incontinence
- ~50% patients don’t refill original script
- ~10 – 15% try different preparation
- Only 10 – 15% persist with Rx for 1 yr
- Adherence rates in practice much lower than in studies
- Perception of lack of efficacy, side-effects, polypharmacy, & costs
- Importance of patient counseling and coordinated management plan

Botox Mechanism of Action
- Indicated for Refactory OAB (unresponsive to anticholinergics and behavioral Rx)
- Both Neurogenic and idiopathic OAB respond to BTxA (J Urol. 2005 Sep;174(3):984-9)
- Efficacy lasts for ~ 6 -12 mths (BJU Int. 2005 Oct;96(8):848-53)
- Improves QoL, effect sustained after repeat injections (over 5 yrs), need for CISC ~47% (J Urol. 2009 Apr;181(4):1773-8)
- Not covered by Medicare and many private insurers

Intravesical Botox Injection
Sacral Neuromodulation

- Intractable OAB, failed nonsurgical Rx
- ~50% test pts demonstrate ≥50% improvement in symptoms by diary
- FDA approval 1997 (InterStim®, Medtronic)

~65-90% maintain efficacy over 3-5 yrs
~1/3 require repeat procedure (lead migration, pain, technical difficulties)
Expensive
- Lead & stimulator $10K
- Hosp/Surg fees $10-20K

Peripheral Nerve Stimulation

- # different sites evaluated
- Posterior Tibial Nerve Stimulation
  - Needle and percutaneous methods
  - 30 min. weekly sessions
  - ~2/3 patients have significant improvement
- Not covered by Medicare and most private insurers

Summary

- UI negatively affects QoL and may lead to isolation and reduced productivity
- Effective Rx exist for Rx of UI
- Non-surgical management is the mainstay of Rx for OAB/Urgo Incontinence
- Intravesical Botox and neuromodulation are options for OAB failing anticholinergic Rx
- Surgical Rx mainstay for significant SUI
Risk Factors for Symptomatic POP

- Increasing parity
  - Vaginal delivery > c-section
  - Protective effect of c-section diminishes with increasing parity and ageing
  - Forceps delivery > SVD
- Increasing weight
- Increasing strenuous work or activities
- Chronic straining with constipation
- Genetic factors
  - Increased transverse diameter of pelvis
  - Family Hx POP
  - Personal Hx hernias or stretch marks
  - Vaginal deliveries

Signs and Symptoms

- Pressure (fullness, heaviness)
- Protrusion ("falling out")
- Urinary retention
- Overflow incontinence
- Constipation
- Vaginal bleeding (ulceration)
- Vaginal Bulge and pressure/heaviness
  - "Feels like insides are going to fall out"
  - Rarely associated with pain
  - Symptoms increase throughout day & resolve with lying down
  - Most reliable predictor of POP
  - Minimal symptoms until "bulge" near or past the hymen
Symptoms of POP

- Poor correlation with anterior compartment prolapse and UI
- Stronger correlation with progressive AC POP and obstructive voiding
- c/o urinary hesitancy, increased throughout day
- Increased PVR and recurrent UTI

Symptoms of POP

- Weak association between progressive posterior compartment prolapse & defecatory dysfunction
- Patients may admit to vaginal or peri-rectal splinting
- Roughly 50 - 70% improvement with surgical repair

- Weak association between PC prolapse and FI
- Most commonly in association with anal sphincter disruption or dysfunction

Pelvic Organ Prolapse
Physical Examination

- Anatomic support in female
- Vaginal tissue
  - Vaginitis
  - Vaginal atrophy
  - Scarring
- Neurologic examination, reflexes
- Levator muscle atrophy and tone
- Consider distended bladder, fecal impaction
- Thorough history and physical
- Stress urinary incontinence present prior to prolapse/vault descent? → urodynamic studies
- Fecal incontinence? → endoanal ultrasound
- Examine in lithotomy and standing position
- Evaluate for all defects

Ancillary Physical

- Standing rectovaginal exam
- Q-tip test
- Perineal descent
- Rectal prolapse
- Determine location of site-specific defects?
Comparison of ordinal grading systems for prolapse, 1963-98

**Levator Ani Muscles**

- Neuromuscular injury allows widening of the genital hiatus and chronic direct stress to the CT attachments
- Pts with POP 7x more likely to have major LA defects on MRI than controls
- PFM contractile force less in POP cases


**Fibromuscular CT Attachments: DeLancey’s Levels of Support**

- Level I - Suspension
- Level II - Attachment
- Level III - Fusion
Management Options for POP

- Minimally or asymptomatic – expectant
- Natural Hx not well defined
- Symptomatic
  - Pessary or surgery
  - Surgery:
    1. Reconstructive or obliterator
    2. Vaginal, abdominal (open, laparoscopic, robotic)
    3. Native tissue or augmentation

Surgical Management of POP

- Keys to successful correction and durability:
  1. Recognition of the CT defects leading to POP
     - Repair the defects or,
     - Perform a compensatory procedure
  2. Surgeon experience
     - Repetition
     - Versatility
  3. Most recurrences occur in the AC – failure to recognize & repair the transverse/apical defect

Recurrent POP

- Historical risk of recurrent symptomatic POP requiring repeat surgery ~30%
- Recurrence risk following surgical repair of AC POP ranges from ~5 – 60%
- Recognition of the importance of apical loss of support increasing
- NHDS Data, 1979 – 1997:
  - rate of repairs for cystocele and rectocele ~constant 120 – 140,000/y
  - rate of apical repairs increased by ~15 fold (1,400 to 22,000/year)
  - Silva, Obstet Gynecol 2006

- Recurrent POP (~Stage II) in 58% - 1 yr FU
  - 71% ant. & 45% post. colporrhaphy
  - only 4% with concurrent apical repair
  - Shull, Am J Obstet Gynecol 1999

- Native tissue repairs with attention given to apical POP show recurrent POP ≤15% at 4 – 5 y FU
  - Silva, Obstet Gynecol 2006
Pelvic Organ Prolapse

“Given the limited data and frequent changes in the marketed products... patients should consent to surgery with an understanding of the postoperative risks and complications and lack of long-term outcomes data.”

FDA Public Health Notification: Serious Complications Associated with Transvaginal Placement of Surgical Mesh in Repair of Pelvic Organ Prolapse and Stress Urinary Incontinence (Issued: Oct 20, 2008)


-+1,000 reports from nine surgical mesh manufacturers of complications
-Most frequent = erosions, infection, pain, recurrent POP, and/or incontinence leading to significant decrease in patient QoL.
-Recommendations to physicians included – “inform patients mesh permanent, complications may require subsequent surgery which may not correct the complication”
-Encouraged reporting of adverse events

French Health Authority’s Report Nov 2006 – “transvaginal mesh should be limited to clinical research”
What factors influence your choice of Surgical Techniques for Rx POP?

- Patient age, physical activities and co-morbid medical conditions
- Previous surgery, including failed POP Rx
- Concurrent AC & PC defects, need for hysterectomy or Rx SUI
- Patients desires & expectations
- Medical literature/research (EBM)

**Surgeons training & experience**

**Conclusion**

PFDs are relatively common and increase with ageing

- POP may or may not be associated with alterations in bowel, bladder, or sexual function
- Surgical correction of POP may enhance, maintain, or worsen bowel, bladder, or sexual function
- Management of PFDs must be individualized to the patients complaints, findings, & expectations

**Female Pelvic Medicine and Reconstructive Surgery**

- Urinary incontinence
- Incomplete bladder emptying
- Pelvic organ prolapse
- Fecal incontinence
- Vesicovaginal fistulae
- Rectovaginal fistulae
- Rectal prolapse
- Mesh complications
- Urinary tract infections