Urodynamics Case Studies

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Tools for Evaluation

- Ears, Eyes, and Brain
- Bladder diary
- Stress test
- Uroflow
- PVR (cath or ultrasound)

- Complex UDS

Evaluation

- Form hypothesis
- Decide what tests are needed to confirm or refute hypothesis
- Consider any other tests that might direct therapy

Case 1

- 44yo healthy female
- Only leaks with cough, sneeze, exercise
- Low volume urine loss
- No urgency/nocturia
- Normal flow
- No pain
- G2 P2 vaginal deliveries

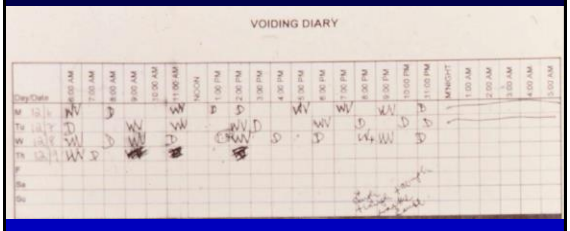
Case 1

- *Hypothesis*: uncomplicated SUI

- *Testing to confirm*:
  - Primary—exam/cough stress test
  - Secondary—bladder diary & PVR

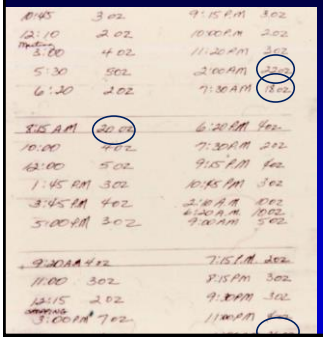
- *Additional testing for management*:
  - Uroflow study
  - Secondary—UDS with VLPP/UPP

Bladder Diary SUI



3 days—9-10 daytime voids
4-5 incontinence episodes/day
No nocturia, dry overnight

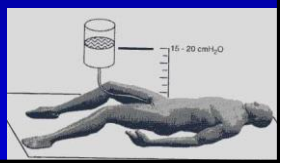
Bladder Diary SUI



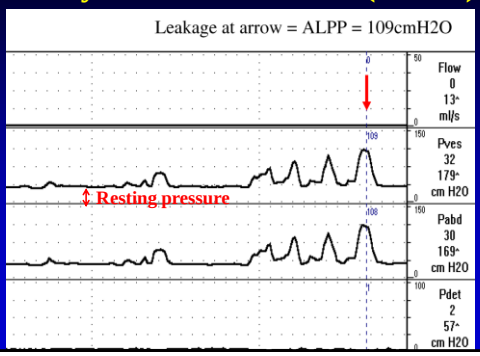
- Daytime: 8-10 voids
- Daytime: 2-7oz
- Night: 1-3 voids
- Night: 10-26oz

Cough Stress Test/Bedside UDS

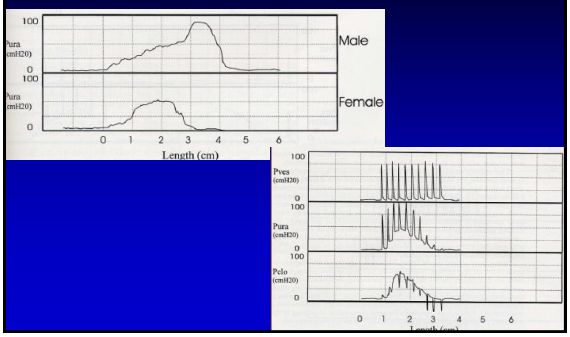
- Bedside Cystometry:
  - Urethral catheter/catheter tip syringe with piston removed
  - Syringe 15-20cm above bladder
  - Fill by gravity (typical goal 230-300cc)
- Can observe
  - Sensation
  - Significant DO
  - Capacity
- Remove catheter
  - Cough test ↑ and →



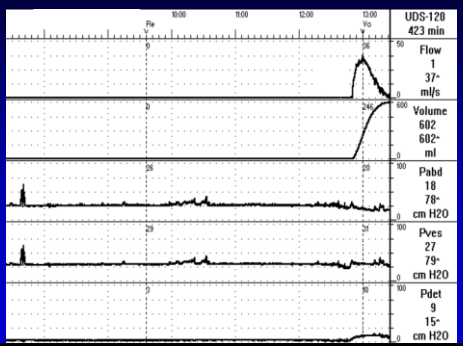
Urodynamic Stress Test (VLPP)



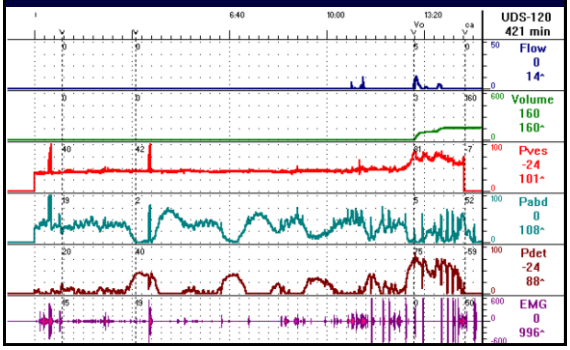
Urethral Pressure Profile



What if full urodynamics done?



What if this were seen?



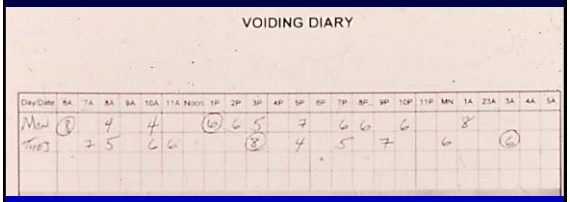
Case 2

- 60yo G0 female
- Complains of day and nighttime urgency gradually worsening 3-5yrs
- Just started wearing pads
- Leaks 3-4x/week
- Secondary bother nocturia x 3
- No stress leakage, no pain, voids normally

Case 2

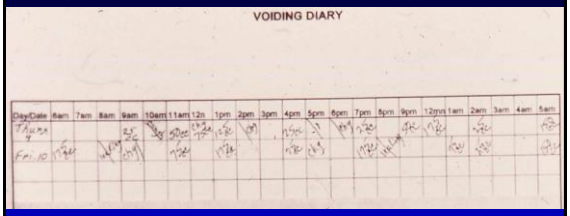
- *Hypothesis*: uncomplicated OAB
- *Testing to confirm*:
  - Bladder dairy
  - PVR
- *Additional testing for management*:
  - Physical exam
  - Urodynamics for invasive therapy

Bladder Diary OAB



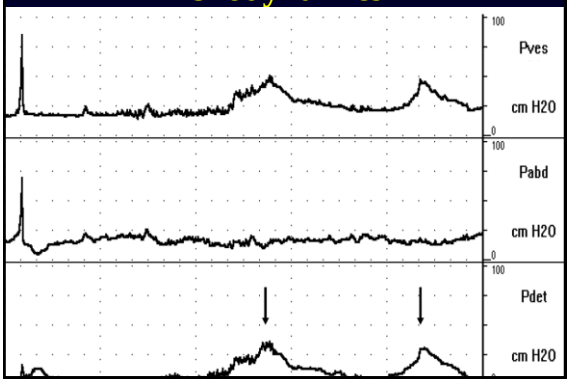
2 days: 10-11 voids/24 hours
All volumes reduced, 4-8oz
2 accidents/day associated with urge

Bladder Diary OAB

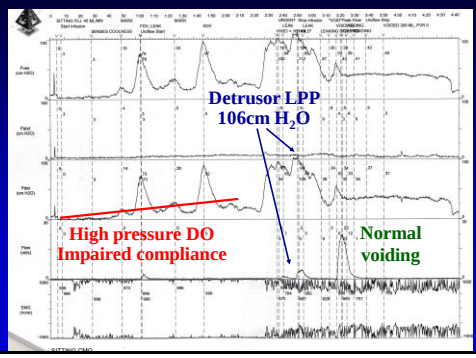


2 days: 12-14 voids/24 hours
All volumes reduced, 1-6oz
2-3 pads/day for leakage

Urodynamics



High Pressure DO Idiopathic



Key clinical factors

- Poor sensation of high pressures
- Leakage occurs with sustained high
- Compliance looks bad

Very high risk patient!!

Case 3—presents for surgery

- 44 yo WF engineer presents for cystocele repair and sling. Prior work-up done elsewhere but surgeon moved
- Mixed symptoms, 2 pads/day
- On oxybutynin and imipramine
- Has tried pessaries and biofeedback

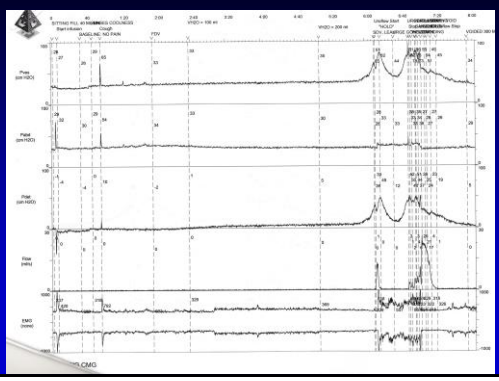
Case 3—initial data

- Void diary, maximum 8oz, most 2-4oz
- Physical exam 45 degrees BN mobility, stage 1 cystocele, good voluntary contraction
- Review prior UDS report—no DI or incontinence demonstrated. Although stage 3 cystocele described only AP views obtained

Case 3

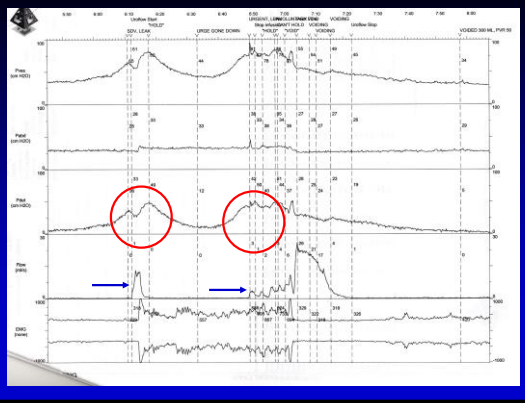
- *Hypothesis*: Mixed urinary incontinence, urge predominant vs. stress predominant
- *Testing to confirm*: full UDS
- *Questions to consider*:
  - Should study be done on medication?
  - How best to do VLPP testing?

CMG on medication

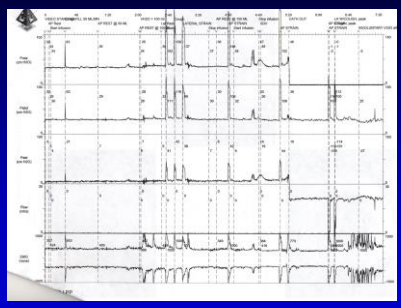


AK--cystometry

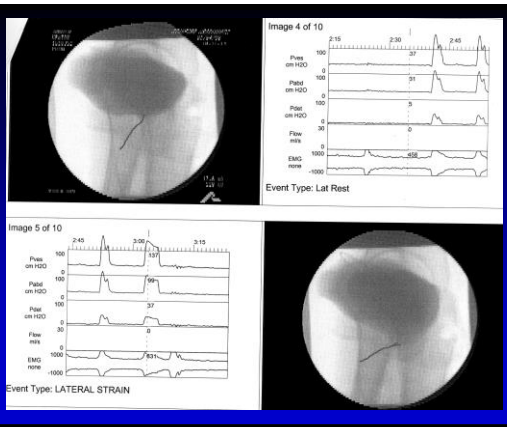
- Filling—
  - sensation intact
  - 49cm H_2O unstable contraction and leakage at 240cc
- Voiding—
  - Void 26/230/50
  - Qmax 26cc/sec, Pdet 25cm H_2O, normal curve,



AK—leak pressures



- 150cc
- leaks at 125cm H_2O
- stress induced DI



AK--recommendation

- Proceed with sling, unlikely to need cystocele repair
- Urgency/DI unlikely to be cured
- Patient reported that she has MS—not on her medical records

Mixed Incontinence Summary

For Surgical Success:

- Look for objectively severe SUI
- Look for evidence of good bladder storage function
  - Good volume on CMG
  - Good volume on bladder diary
- Know your patient's goals

Case 4—Difficulty Voiding

- 20yo G0 female with recurrent pyelo since childhood
- Urology eval age 15: "short ureter" and bilateral hydro (left > right)
- Age 16 had a left ureteral reimplant. No change in symptoms after surgery
- Patient states she was "potty trained early" and was told by her mother that if not prompted would only void 2-3x/day as a child

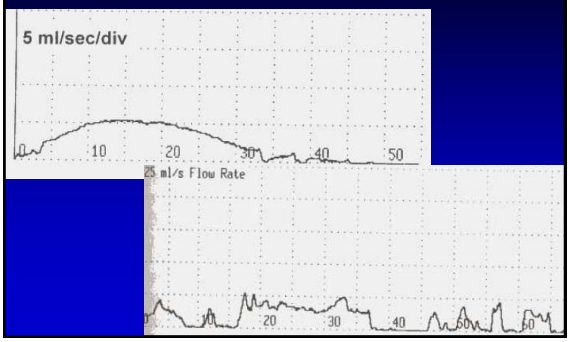
Case 4—Difficulty Voiding

- has incontinence if "waits too long"
- tried tolterodine and oxybutynin in the past with no help
- "a little" leakage with cough, sneeze, exercise
- voids q1-2 hrs; nocturia 0-1x
- usually strains to initiate stream and to empty
- does not wear pads

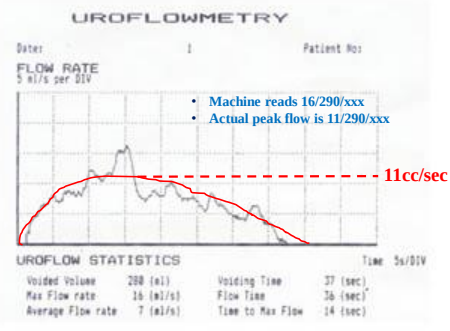
Case 4

- *Hypothesis*:
  - Bladder neck obstruction
  - Weak detrusor
  - Other (NGB, etc.)
- *Testing to confirm*:
  - Uroflow suggestive only
  - UDS will be required (video best)

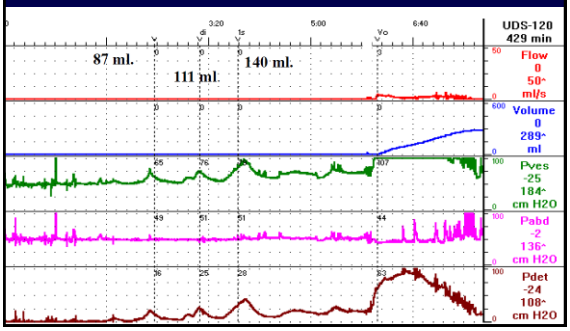
Free Flow Study



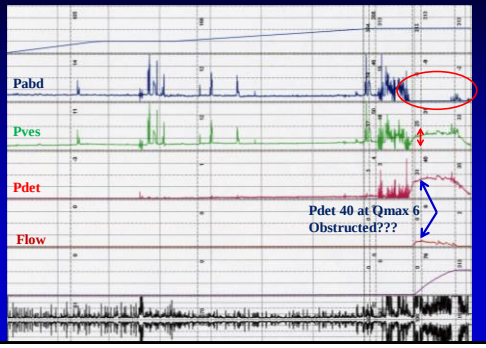
Interpreting Uroflow



Urodynamics



Urodynamics



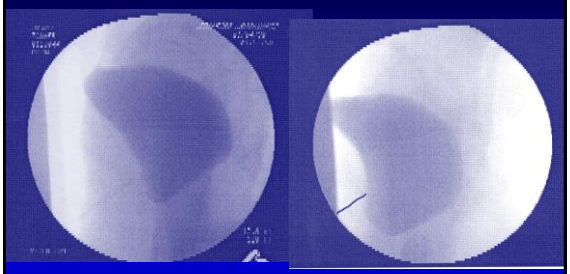
Case 5

- Chief complaint LUTS
- Two prior operations—years ago, no details, one retropubic
- Cystocele at +2. Bladder neck near normal position, no mobility, no SUI
- 250cc PVR
- Prolapse symptoms mild/minimal

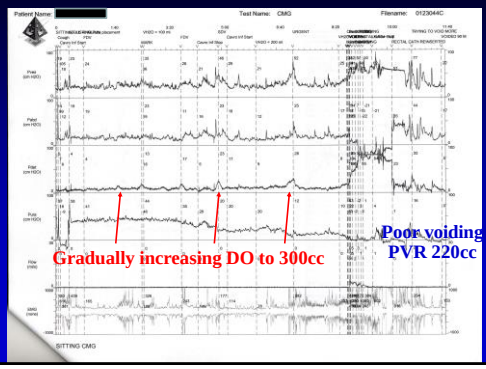
Case 5

- *Hypothesis*: differential diagnosis retention due to obstruction from SUI surgery, from cystocele or just poor detrusor
- *Testing to confirm*: pessary trial vs. full UDS
- *Key questions*: Detrusor function during voiding

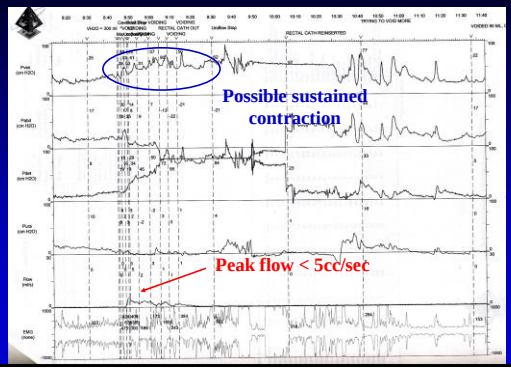
Lateral Cystogram



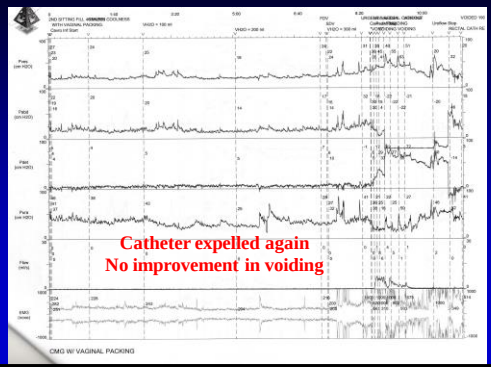
Fill-void CMG



Voiding Dynamics

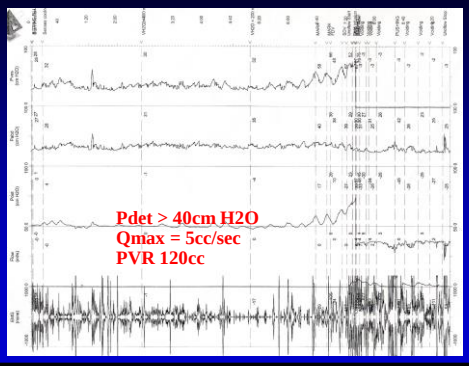


CMG with vaginal pack

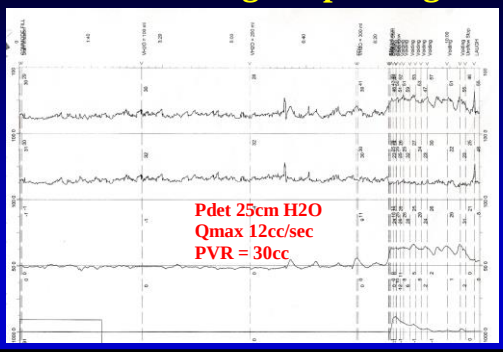


- Compare to a second prolapse patient with similar history

First CMG



CMG with vaginal packing



Prolapse and Retention

Favorable surgical candidates:

- Reversal of obstructed voiding, especially with significant PVR
- Good capacity on CMG and/or diary but bad daytime LUTS

Case 6

- 35 yo G0 scientist with MS
- Moderate urge incontinence
- Manages bladder spontaneous voiding
- Occasional UTIs—no pyelo
- No meds, no prior evaluation

Neurogenic Bladder

Neurogenic Bladder: Indications for UDS

- All Spinal Cord injury and Spina Bifida
  - At some point after recovery from injury
  - As needed thereafter based on original findings and symptoms
- Multiple sclerosis with refractory incontinence/LUTS
- Stroke, Parkinson's, other
  - As needed to manage clinically

Neurogenic Bladder

- Cystometry clearly demonstrated to predict upper tract deterioration in spina bifida children
- Pressure kills kidneys

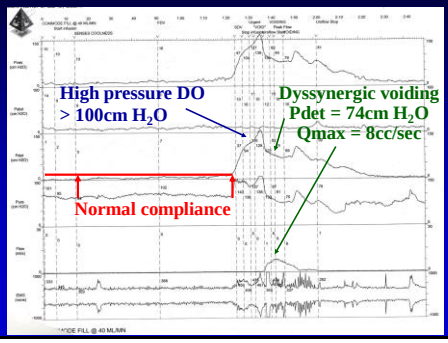
Required Baseline Information

- Current bladder management with record of home volumes
- Cystometrogram
- Bladder sensation

Case 6

- *Hypothesis*: Unsafe neurogenic bladder requiring self catheterization
- *Testing to confirm*: Full UDS
- *Key issues*: Assure that renal function is protected from high bladder storage pressures

Initial UDS in MS Patient



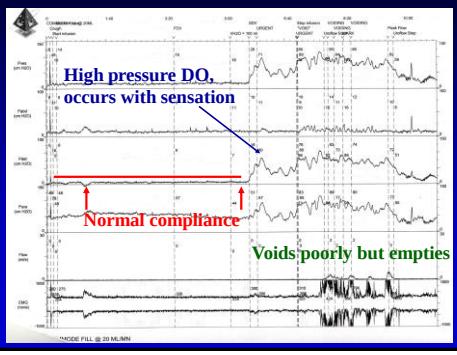
Clinical Course

- Renal Ultrasound no hydro/stone
- Unable to perform ICP due to tremor
- Intolerant of anticholinergics, uses on PRN basis
- Scheduled annual CMG/renal US
- Slowly progressive MS

Neurogenic Bladder Summary

- Management key is determining the typical storage pressure
- Tools
  - Voiding diary
  - CMG with sensations
  - Residual urine
- Voiding dynamics are much less important—only minutes per day

Five Year Follow-up Untreated



Case 7

- 25yo female presents with severe incontinence 3 years after OF repair
- Married age 16
- First pregnancy age 17 delivered girl successfully
- Second pregnancy age 18 obstructed labor x 3 days, stillborn, fistula
- Age 22 underwent OF repair with bladder flap neourethra for "large" circumferential fistula

Case 7

- *Hypotheses*:
  - Neourethra failed (ISD)
  - Neourethra failed (obstruction)
  - Detrusor failure (neural injury)
  - Detrusor overactivity
  - Detrusor tissue loss (non-compliance)
  - Any combination of above
- *Testing to confirm*: everything

Urodynamics