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Management of bowel and bladder symptoms

Education

1983 BS, Mathematics, Cum Laude, The Ohio State University
1987 MD, The Ohio State University College of Medicine

Postgraduate Education

1987-1988 Surgery Intern, University Hospitals of Cleveland, Cleveland, Ohio
1988-1989 Surgery Resident, Albany Medical Center Hospital, Albany, New York
1989-1991 Urology Resident, Albany Medical Center Hospital, Albany, New York
1991-1992 Chief Resident, Urology, Albany Medical Center Hospital, Albany, New York
1992-1994 Clinical/Research Fellow, Pediatric Urology, The Hospital for Sick Children
Toronto, Ontario, Canada

Teaching Appointments

July 1, 1994 – Present Clinical Assistant Professor, Division of Urology
The Ohio State University Medical Center, Columbus, Ohio

Certification February 28, 1996 American Board of Urology

Honor Societies

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Dr. Jayanthi is widely published in urological books and journals.

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Neuropathic bladder and bowel dysfunction

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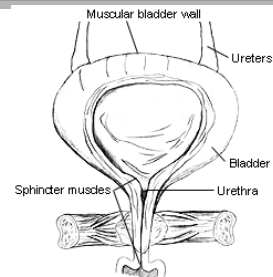
Outline of presentation

- A primer on the bladder
- Normal bladder function
- Bladder dysfunction

Importance of bladder dysfunction

- Number one cause of death in spinal cord injury patients in first half of 20th century
 - Renal failure secondary to complications of bladder dysfunction
- Renal failure is distinctly rare at present time due to efficacy of modern medical therapy

Basic anatomy



Normal bladder function

- Storage
- Emptying
- Which function is more important?
 - Emptying: If one voids 4 - 5 times per day and each void takes 5 minutes, emptying function fills less than 30 minutes per day
 - Storage: $23.5/24 = 97.9\%$

Normal storage function

- Bladder capacity is less important than bladder pressure
- Pressure in bladder is low during storage and should only increase during voluntary voiding
- High storage pressures may lead to renal damage

How does one void?

- First step: Sphincter relaxation
- Second step: Coordinated bladder contraction
- No need for abdominal muscles

Do you need a brain to urinate?

- Stroke victims may void normally but not at the right time or location

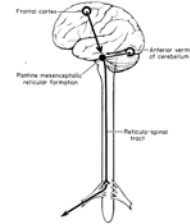
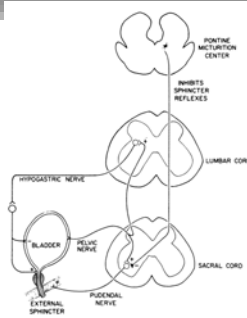


Figure 4-11. Cerebral, cerebellar, and spinal motor pathways.

Overview of neuronal pathways



Main types of bladder dysfunction

- "spastic bladder"
 - examples: spinal cord injury
- "atonic bladder"
 - Pelvic injury, surgical complications
- Mixed lesions
 - spina bifida, congenital neurological lesions

Abnormal bladder function

- Many classifications/descriptions exist
 - For example
 - "Upper/lower motor neuron lesions"
 - "Sensory/Uninhibited/Reflex neurogenic bladder"
 - Such formal classifications are impractical

Simple minded approach

- Failure to empty
 - due to bladder
 - due to outlet
- Failure to store
 - due to bladder
 - due to outlet
- Both

How to diagnose bladder dysfunction

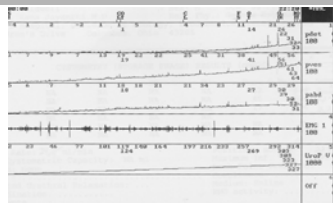
- History
- Symptoms
- Degree of incontinence
- Urinary tract infections
- Urodynamics

What are urodynamics?

- A test of bladder storage function
- Bladder slowly filled via catheter and pressure response measured



Urodynamics



Variables measured:

Bladder pressure
Abdominal pressure
Sphincter activity

Management of bladder dysfunction

- Based on underlying pathophysiology
- No "right" answer
- Must individualize based on age of patient, home situation, motivation for dryness, etc.

Causes of failure to empty

- Poor detrusor contraction
- Non-coordinated bladder contraction
- Non-relaxation of urinary sphincter

Failure to empty

- Easiest form of bladder dysfunction to treat
- Intermittent catheterization has revolutionized management of neuropathic bladders
- Previously patients would have indwelling catheters or urinary diversion

Chronic indwelling catheters

- Great short term solution
- Lousy long term solution
 - chronic infections
 - stones
 - urethral erosion
 - cancer

Failure to empty

- Ineffective or poor methods
 - pharmacological stimulation
 - noncoordinated contraction
 - Crede maneuver
 - no preceding sphincter relaxation
- Problem associated with these methods
 - potentially large post-void residuals

Failure to store

- A more common problem
 - clinical manifestation is "incontinence"
- A potentially much more complex problem than failure to empty

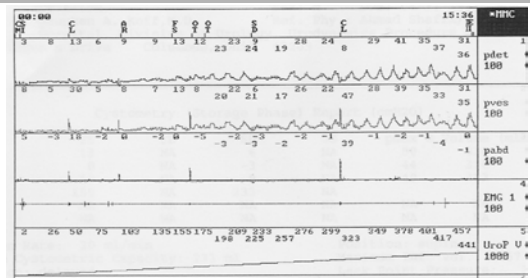
Causes of failure to store

- Bladder hyperactivity
- Poor sphincter mechanism
- Poorly compliant bladder

How can we differentiate between these three?

- History
- Urodynamics

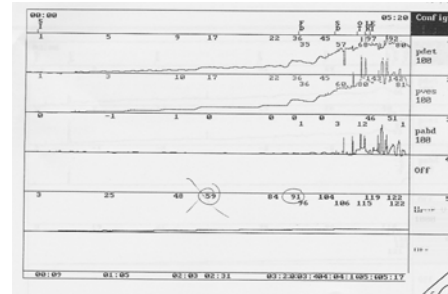
Bladder instability



Treatment of bladder instability

- Anticholinergics
 - Ditropan XL (oxybutinin)
 - Detrol (tolteridine)
 - Levsinex (hyoscyamine)

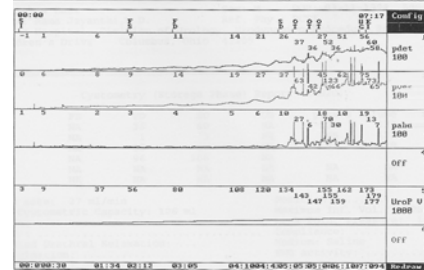
Patient MB: High pressure bladder



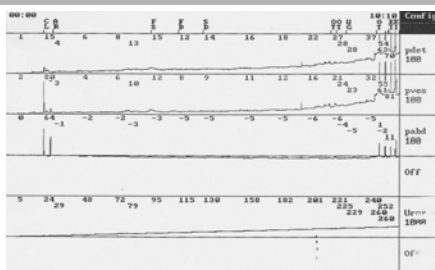
Treatment of high pressure bladder

- Anticholinergics
- Surgery
 - Bladder augmentation
 - Addition of healthy tissue (the intestine) into unhealthy tissue (the abnormal bladder)

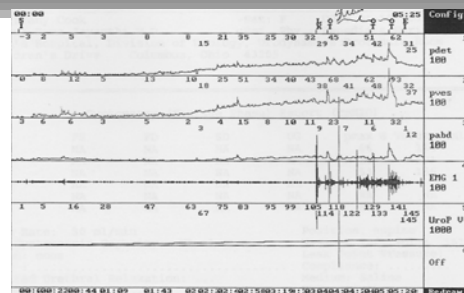
Patient MB: Study on anticholinergics



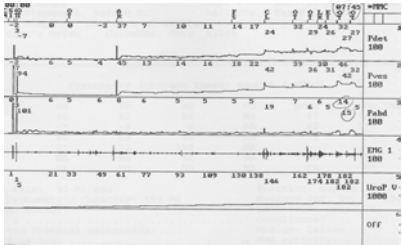
Patient MB: Study on higher dose of anticholinergics



28 year old with incontinence



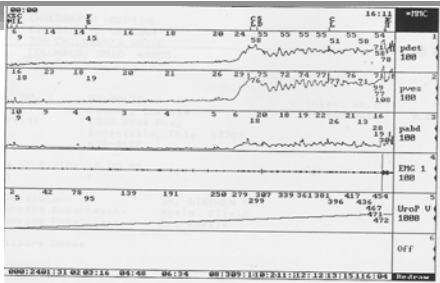
Sphincter deficiency



Treatment of sphincter dysfunction

- Medical therapy
 - adrenergics: Pseudoefed
- Surgical therapy
 - "less than ideal"
 - Bladder neck reconstruction
 - Artificial sphincter
 - "Sling"

Importance of pressure-volume relationship



250 cc - safe volume, 450 cc - unsafe volume

Timing of surgical intervention

- No correct answer
- Main issue to consider:
 - Child's and not parents motivation and interest in continence
 - Ideal time for surgical intervention is when child is interested and is willing to participate in his/her medical care

Bladder stimulation

- Stated advantages
 - Increase bladder capacity
 - May teach child to sense need to void
 - May obviate the need to perform bladder augmentation
- Disadvantages
 - Labor intensive
 - Little appreciable impact on daily life

Bowel dysfunction

- Bladder ↔ Bowel
 - Dysfunction in one commonly associated with dysfunction in the other
- Bowel dysfunction harder to analyze/treat
- Much greater number of variables

Differences between bowel and bladder

Bowel

- Volume hard to measure
- Consistency may vary depending on diet
- Difficult to "easily" empty

Bladder

- Volume easy to measure
- Urine always "watery"
- Can easily empty bladder (with catheter)

Bowel management

- Rectal stimulation
- Intermittent enemas/suppositories
- "Miralax" - The MIRacle LAXative
- MACE procedure
 - "antegrade enema procedure"

Go Columbus!!!!!!

