MANAGEMENT OF NEUROGENIC BLADDER
Lower Urinary Tract Reconstruction

David A. Ginsberg, M.D.
Associate Professor of Urology
USC Keck School of Medicine
Chief of Urology
Rancho Los Amigos National Rehabilitation Center
Disclosures

• David Ginsberg, MD
  Grants/research support: Allergan, Tengion, Medtronic
  Consultant/advisory board member: Allergan, AMS
  Speaker’s Bureau: Allergan, Pfizer, AMS
  Honoraria from Industry: Allergan, Pfizer, AMS

• CME Staff Disclosures
  Professional Education Services Group staff have no
  financial interest or relationships to disclose.
Learning Objectives

At the conclusion of this activity, the participant will be able to:

1. Appreciate the INDICATIONS for reconstruction in patients with NGB
2. Understand the OPTIONS available for patients desiring lower urinary tract reconstruction
3. Recognize some of the potential COMPLICATIONS seen after lower urinary tract reconstruction
Obtaining CME Credit

• If you would like to receive CME credit for this activity, please visit:

  http://www.pesgce.com/PVAsummit2011/

• This information can also be found in the Summit 2011 Program on page 8.
Continent LUT Reconstruction

Why?

• Wants to manage lower urinary tract with CIC
• Failed conservative/medical therapy
Continent LUT Reconstruction Why?

- Wants to manage lower urinary tract with CIC
- Failed conservative/medical therapy
  - Incontinent between catheterization
  - Elevated detrusor storage pressures (UDS)
Continent LUT Reconstruction
Why?

- Wants to manage lower urinary tract with CIC
- Failed conservative/medical therapy (UDS)
- Not interested in other options
  - Diaper/pad
  - Indwelling catheter
  - Reflex void to condom catheter
  - Incontinent diversion
Continent LUT Reconstruction

What?

• Bladder Augmentation
• Bladder augmentation + continent urinary stoma
• Continent urinary reservoir
Continent LUT Reconstruction

What?

- Augment with continent urinary stoma
  - Facilitate CIC
  - Unusable/incompetent urethra
  - Intact anti-reflux mechanism
- Continent stoma
  - High-capacity, low pressure bladder
  - Unable to catheterize per native urethra
- Continent reservoir
  - Bladder dysfunction requiring cystectomy
  - Bladder cancer
  - Significant vesical fistulae
Continent LUT Reconstruction
What?

- Bladder Augmentation
- Bladder augmentation + continent urinary stoma
- Continent urinary reservoir
  - Rarely needed
  - If able to avoid continent urinary reservoir
    - Maintain native anti-reflux mechanism
    - Eliminate potential for complications related to ureteral reimplant into bowel
Bladder Augmentation

Bladder augmentation + continent urinary stoma

Potential concomitant procedure to increase outlet resistance
LUT Reconstruction
What?

- Bladder Augmentation
- Bladder augmentation + continent urinary stoma
- Potential concomitant procedure to increase outlet resistance
- Incontinent reconstruction
  - Ileal conduit
  - Ileovesicostomy
Contemplating Surgery

☑ Adequate trial of conservative therapy
☑ Evaluate bladder and outlet
☑ Able to perform CIC
  – Who will catheterize
    • Patient
    • Family member
    • Caregiver
  – Where will catheterize
    • Urethra
    • Continent urinary stoma
CIC – Who and Where
Who benefits from a stoma?

• Female MS/spinal cord injury
• MS/Cervical SCI with poor upper extremity function
• Patient desires CIC, unable to catheterize native “bad urethra”
  – Unreconstructable (pressure ulcers)
  – Bad stricture disease
  – Incompetent
CIC – Who and Where
Who benefits from a stoma?

Female MS/SCI pts
• Prefer construction of continent stoma?
• Trade-offs
  – bigger surgery + greater complication rate
  vs.
  – ease of CIC
• Patients help make this decision
CIC – Who and Where
Who benefits from a stoma?

MS/Cervical SCI with poor upper extremity function

– Does pt have dexterity to do CIC on own?
– Support at home for others to do CIC?
– Can IC be taught
  • Nurse specialist
  • Occupational therapist

– Is disease progressive?
Cervical SCI - Management

- Indwelling catheters
- Reflex void to condom catheter
- Ileal conduit/ileovesicostomy
Cervical SCI - Management

- Indwelling catheters
- Reflex void to condom catheter
- Ileal conduit/ileovesicostomy

- Reconstruction requiring CIC not often pursued

Is this a feasible option for these patients?
Patient

- 32 year-old male, C4-C5 spinal cord injury
- Multiple prior sphincterotomies
- Recurrent UTI/incomplete emptying
- Desires to be
  - Dry
  - Independent
  - Infection free
- Underwent augment/BNC/continent stoma

BNC = bladder neck closure
Patients

• Patients accrued between 1988-1996
• 28 patients with cervical SCI and limited upper extremity function
• 21 evaluable
• Average follow-up of 60 months

Results

- All but one regularly catheterized
- 14 of 20 (70%) satisfied on visual analog scale
- Improved QOL in 13 of 19 (68%)
  - lack of urinary drainage bags
  - independence in management of urine
  - continent

Warning!!!

• Recipe for disaster if insufficient support at home
• Talk to patient
• Talk to family
• Is disease progressive????
• If any doubt, do not perform reconstruction requiring CIC on patient unable to self-cath
Evaluate Bladder & Outlet

Clues to a bad outlet

• Leak with transfer/pressure release
• Level of lesion/injury
  – Sacral
  – Lower thoracic/lumbar?
  – Ischemia distal to “level”
• Evaluate urodynamically
  – Fluoroscopy very helpful
Don’t Forget the Outlet

- T12 SCI
- S/P augment
- Still incontinent
- Leakage c/w SUI

Valsalva with stress incontinence
Options – Neuropathic ISD

- Collagen
- Male sling
- AUS
- Bladder neck reconstruction
- Bladder neck closure
- Puboprostatic sling
Options – Neuropathic ISD

- Collagen
- Male sling
- AUS

- Bladder neck closure
  - Permanent disruption unnecessary in most pts
  - Patients prefer catheterizing per urethra
  - Risk of breakdown of BN closure
  - Reserve for unreconstructable outlet
Unreconstructable Outlet?

Catheter
Unreconstructable Outlet?
Decrease Storage Pressures

- Anticholinergics
- Botulinum toxin
- Lower urinary tract reconstruction
  - Bladder augmentation
    - +/- continent urinary stoma
    - +/- sling/BNC
  - Incontinent reconstruction
    - Conduit vs. ileovesicostomy
    - +/- sling/BNC
Decrease Storage Pressures

• Anticholinergics
• Botulinum toxin
• Lower urinary tract reconstruction
  – Bladder augmentation
    • +/- continent urinary stoma
    • +/- sling/BNC
  – Incontinent reconstruction
    • Conduit vs. ileovesicostomy
    • +/- sling/BNC
Bladder Augmentation
Continent Urinary Stoma
Mitrofanoff
Continent Urinary Stoma

- Mitrofanoff appendicovesicostomy
- Monti
- Kock
- Indiana (ileocecal valve)
- T-limb

Multiple options all with outstanding outcomes, surgeon needs to use what comfortable with
Lower Urinary Tract Reconstruction

• Incontinent urinary stoma – allows urine to freely pass through abdominal wall opening (urine into a bag – “colostomy for urine”)
  – Conduit – ureters to intestine, no bladder involved
  – Ileovesicostomy – “chimney” of intestine secured to bladder and then out abdomen. Ureters are kept in normal position.
Ileal Conduit
Augmentation

- Bladder – bivalve
- Bowel segment – ileum vs. colon
- “Extraperitoneal”
- Laparoscopic/Robotic
- Tissue engineering?
Neurogenic Bladder Surgical Algorithm

Detrusor overactivity
Failed medical therapy
Wishes to manage bladder with CIC

Competent outlet
Able to catheterize per urethra
Bladder augmentation

Incompetent outlet
Desires IC per urethra
Bladder augmentation + sling vs. AUS
Neurogenic Bladder Surgical Algorithm

Failed medical therapy
Wishes to manage bladder with CIC
Unable to IC per native urethra

Low bladder storage pressures
- Continent urinary stoma

High bladder storage pressures
- Bladder augmentation with continent urinary stoma

Incompetent outlet
- Concomitant bladder neck closure vs. sling
Complications of Prior LUT Reconstruction

- Stones
- Perforation
- Pregnancy
- Stoma
- Vitamin B12
- Latex
- Cancer
Complications of Prior LUT Reconstruction

- Stones
- Perforation
- Pregnancy
- Stoma
- Vitamin B12
- Latex
- Cancer

- Incidence after augment 10-50%
- Higher incidence if with continent stoma
  - 5X more common than if CIC per native urethra
  - 10X more common if CIC done per Mitrofanoff
- Usually managed endoscopically

Complications of Prior LUT Reconstruction

- Stones
- Perforation
- Pregnancy
- Stoma
- Vitamin B12
- Latex
- Cancer

- High index of suspicion
- Abdominal distention
- +/- pain
- Extravasation on (CT) cystogram
- Younger patients that do not stay on CIC program
- Immediate surgical repair
Complications of Prior LUT Reconstruction

• Frequent UA and early/aggressive treatment of UTI to minimize risk of pyelo/premature labor

• Vaginal vs Caesarean after LUT reconstruction
  – Standard vaginal delivery if enterocystoplasty alone
  – If concomitant procedure for outlet
    • Caesarean to minimize disruption to the continence mechanism

• If Caeasrean → OB understand reconstructed anatomy

• Have urologist available if OB is unsure of the anatomy

Complications of Prior LUT Reconstruction

- Stones
- Perforation
- Pregnancy
- Stoma
- Vitamin B12
- Latex
- Cancer

- 20-30% risk of malfunction requiring revision
- Stenosis (Mitrofanoff)
- Leak
- Inability to pass catheter
  - Need to get bladder emptied
  - Emergency room
  - Catheter per stoma, urethra or suprapubic (CT-guided?)

Complications of Prior LUT Reconstruction

- Stones
- Perforation
- Pregnancy
- Stoma
- Vitamin B12
- Latex
- Cancer

- Signs/symptoms of B12 deficiency
  - Megaloblastic anemia
  - Peripheral neuropathy
  - Loss of positional and vibratory sense
  - Memory loss, irritability, dementia

- Difficult to access in SB/SCI population

- Screen earlier vs. empiric therapy
Complications of Prior LUT Reconstruction

• Lethal at time of diagnosis (stage T3-T4)
  • Austin JC, et al
    – 8 patients with NGB with bladder cancer
    – One had prior augment
    – 7 of 8 present with locally advanced/LN + disease
  • Problem of augment or problem with bladder itself?

Complications of Prior LUT Reconstruction

- 153 pts followed >10yrs post-augment, compared to age-matched pts with NGB
  - 1.5% per decade risk post-augment
  - 6-7 fold risk compared to “normal” population
  - Only 2 x greater risk compared to pts with NGB w/o augment
- Evaluate if >4 UTI/yr, chronic pain, gross hematuria
- Cystoscopy if colon augment >50yo
  - Colon cancer at 50 yrs – 5%
  - Need colonoscopy/cystoscopy at same protocol

Husmann DA, AUA 2009
Complications of Prior LUT Reconstruction

- 153 pts followed >10yrs post-augment, compared to age-matched pts with NGB
  - 1.5% per decade risk post-augment
  - 6-7 fold risk compared to “normal” population
  - Only 2 x greater risk compared to pts with NGB w/o augment

- Evaluate if >4 UTI/yr, chronic pain, gross hematuria

- Cystoscopy if colon augment >50yo
  - Colon cancer at 50 yrs – 5%
  - Need colonoscopy/cystoscopy at same protocol

Husmann DA, AUA 2009
Conclusions

• Good results with LUT reconstruction of the NGB
• Choose carefully –reconstruction requiring CIC risky if unreliable pt
• Multiple options available
• Don’t forget the outlet
• With appropriate procedure able to
  – Protect upper tracts
  – Maintain social continence