



RANCHO LOS AMIGOS
NATIONAL REHABILITATION CENTER



USC
NORRIS

MANAGEMENT OF NEUROGENIC BLADDER

Lower Urinary Tract Reconstruction

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Disclosures

- David Ginsberg, MD
 - Grants/research support: Allergan, Tengion, Medtronic
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 - 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.



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Continent LUT Reconstruction Why?



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- 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?

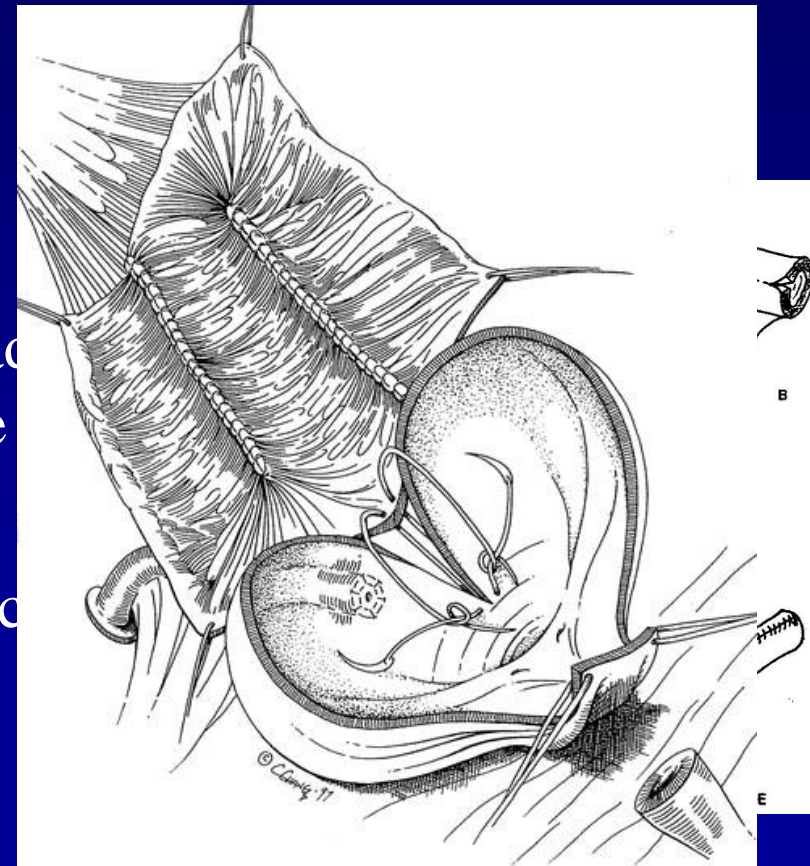
- Wants to manage lower urinary tract with CIC
- Failed conservative/medical therapy (UDS)
- Not interested in other options
 - Diaper/pad
 - Indwelling catheter
 - Reflex void to condom catheter
 - Incontinent diversion

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
- Continent reservoir
 - Bladder dysfunction requiring catheter
 - 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



Continent LUT Reconstruction What?

- 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



Scooter for Seniors

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

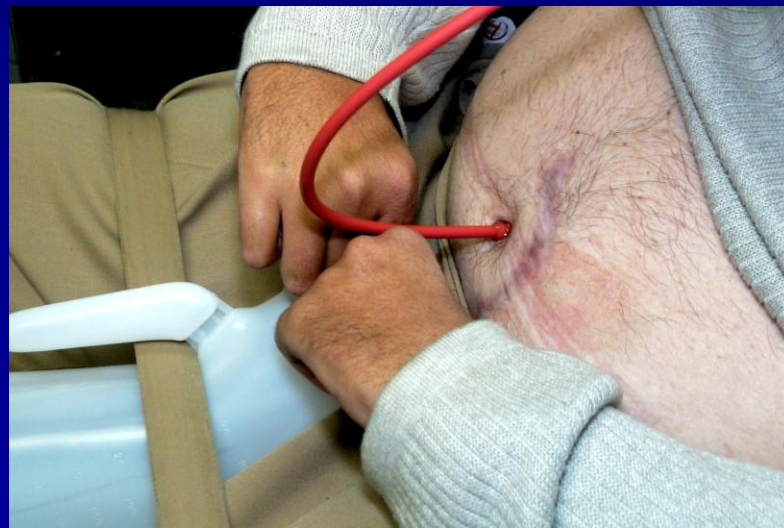
BNC = bladder neck closure



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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

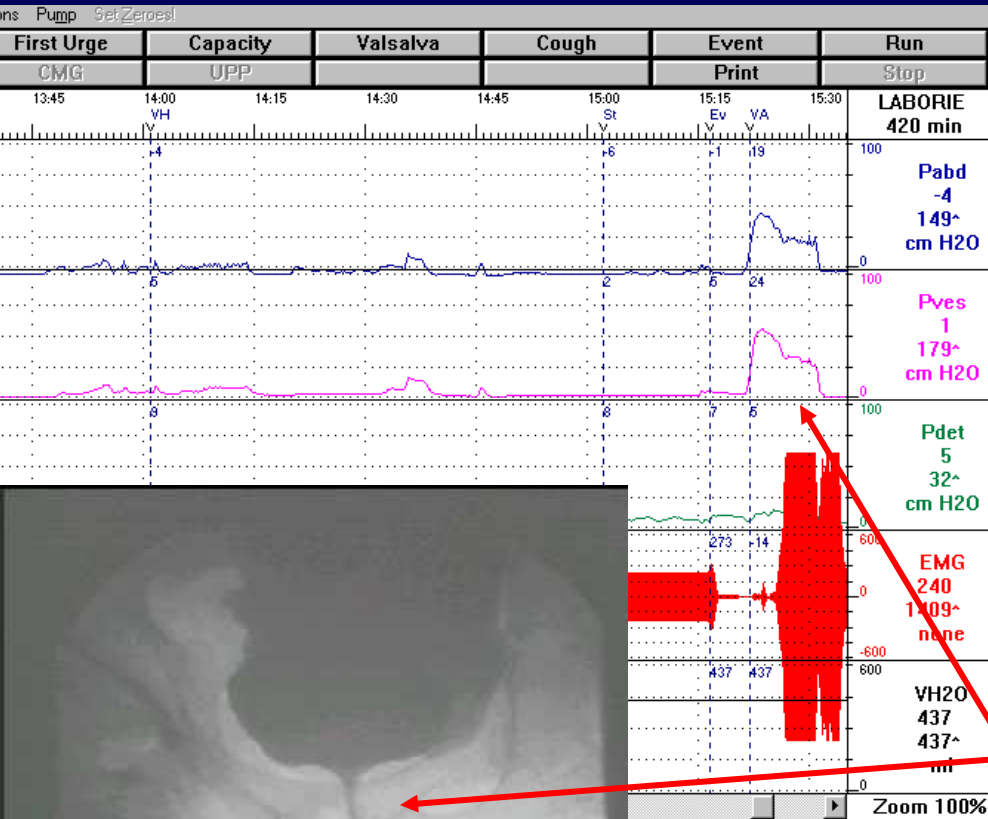


Evaluate Bladder & Outlet

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

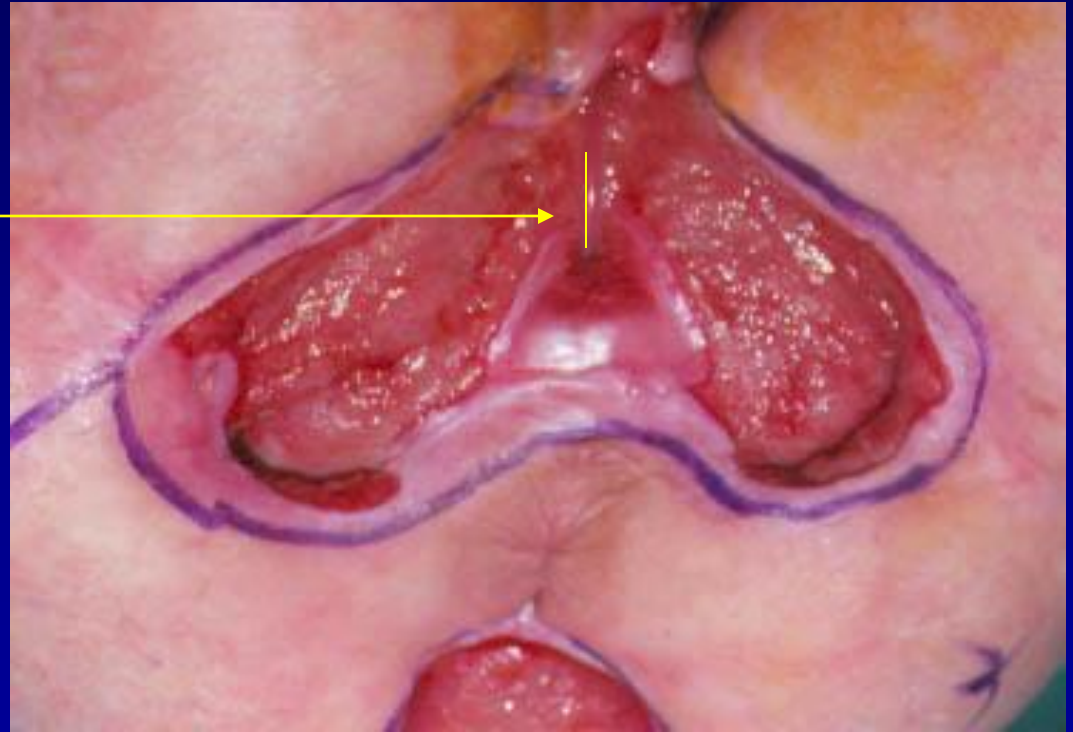
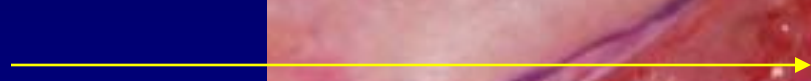
Options – Neuropathic ISD

- 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



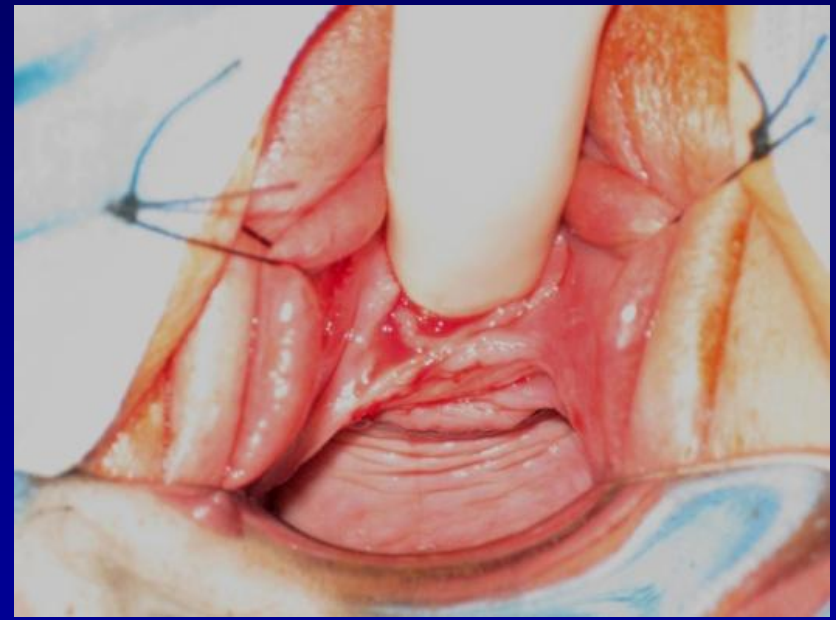
Unreconstructable Outlet?

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

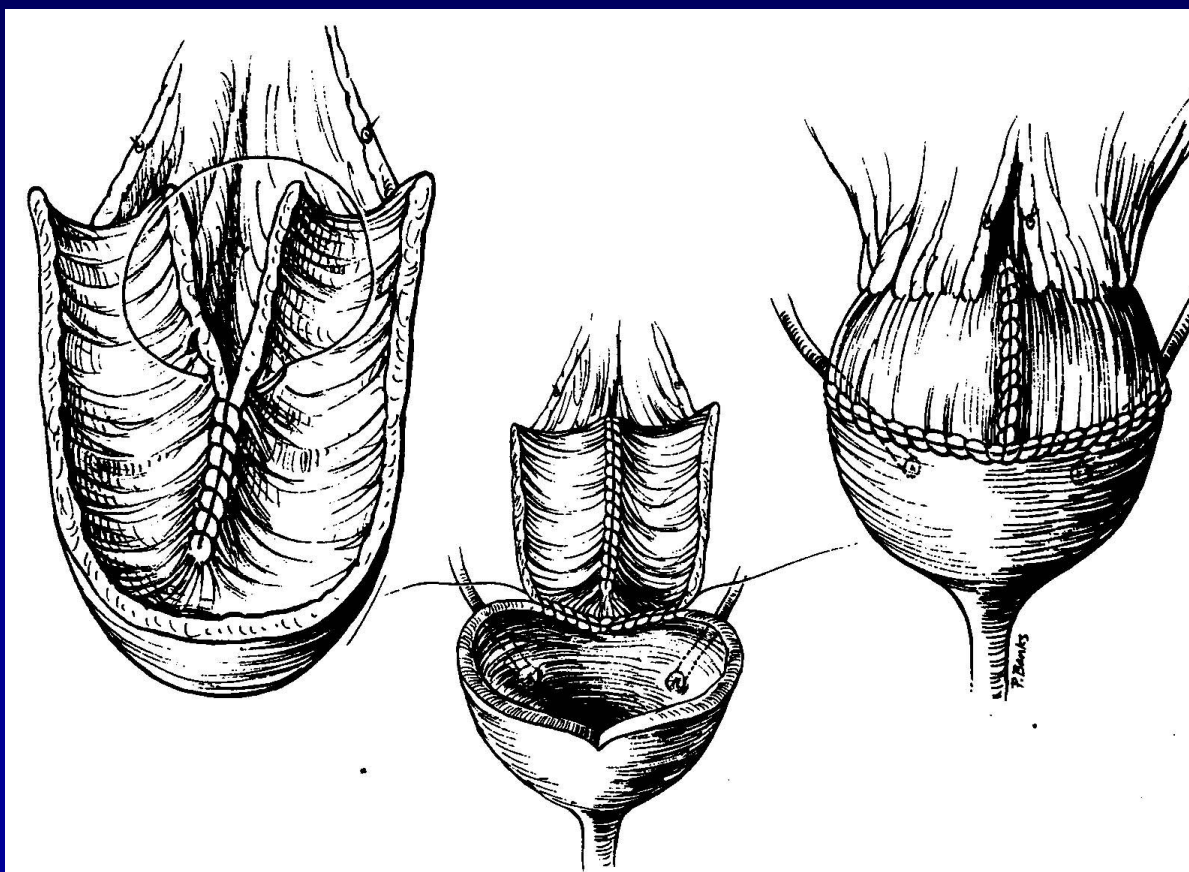


Decrease Storage Pressures

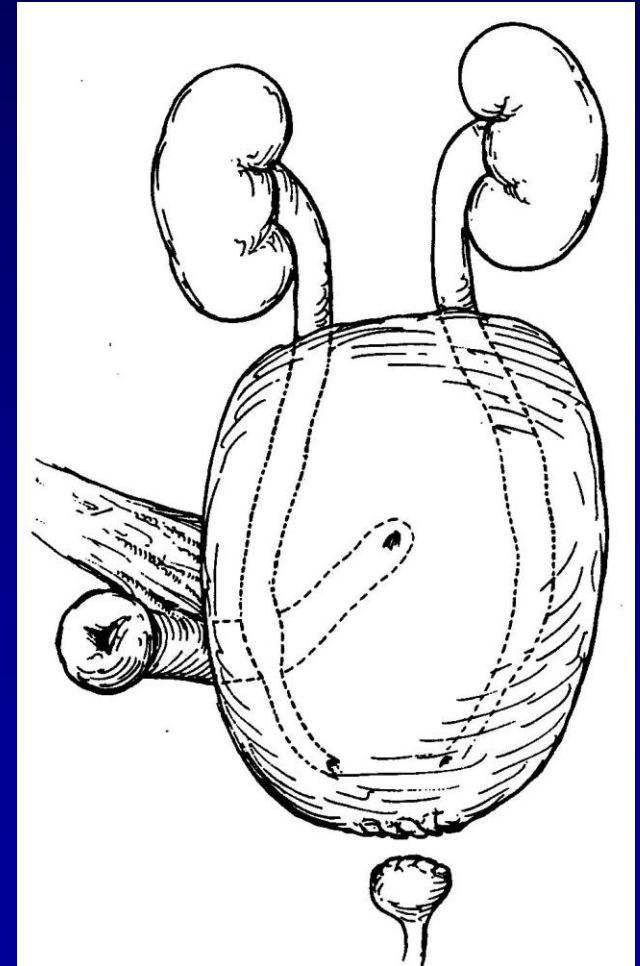
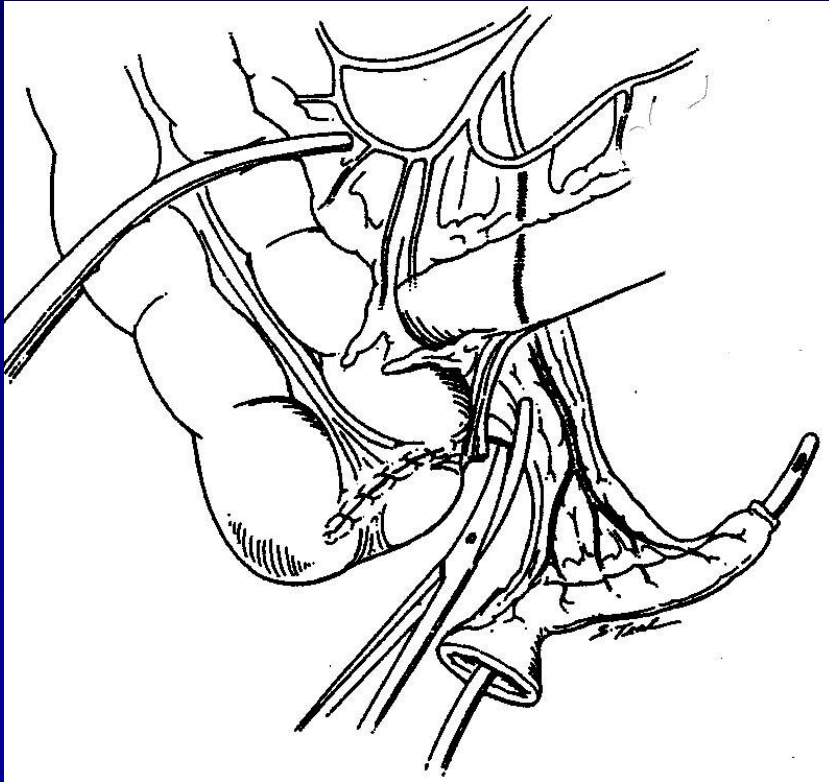
- Anticholinergics
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 - Incontinent reconstruction
 - Conduit vs. ileovesicostomy
 - +/- sling/BNC



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



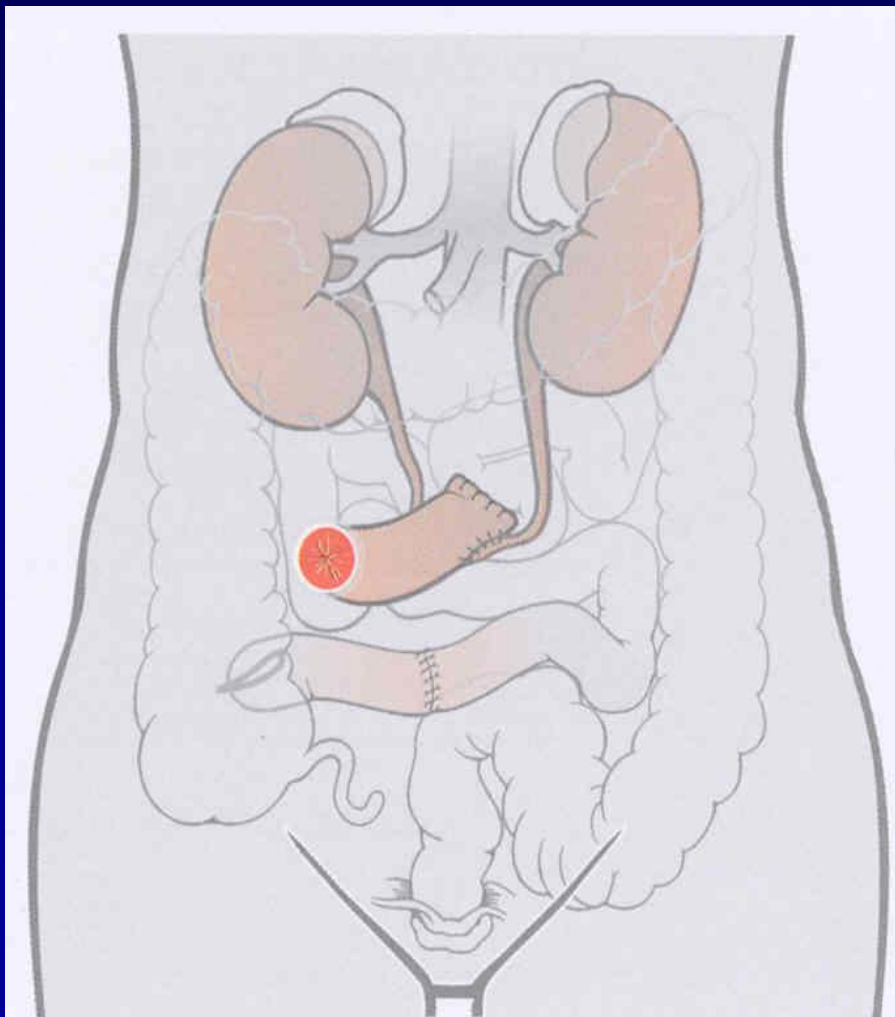
Lower Urinary Tract Reconstruction



- 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

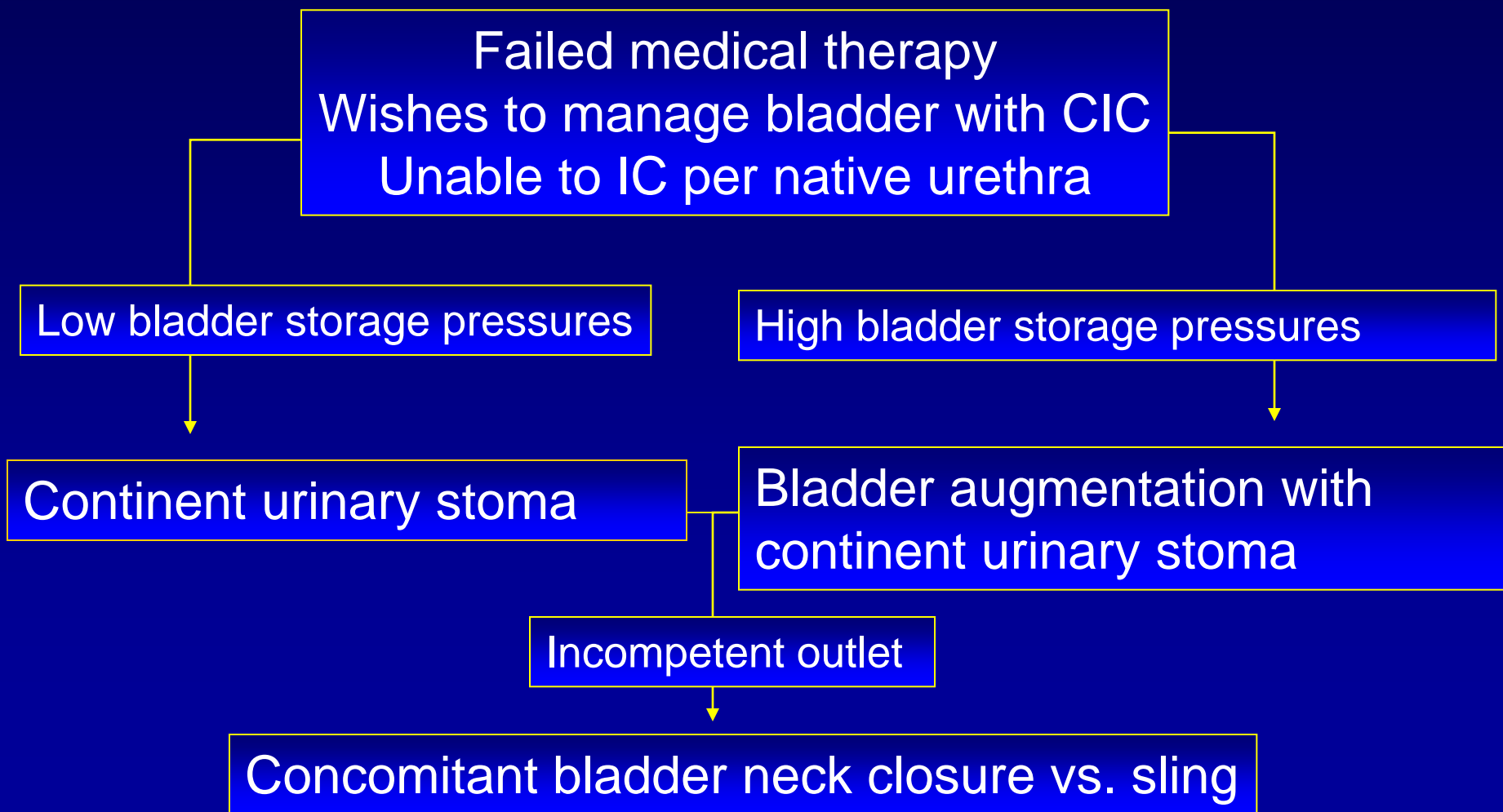
Competent outlet
Able to catheterize per urethra

Bladder
augmentation

Incompetent outlet
Desires IC per urethra

Bladder augmentation +
sling vs. AUS

Neurogenic Bladder Surgical Algorithm





Complications of Prior LUT Reconstruction

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

Complications of Prior LUT Reconstruction

- Stones
- Perforation
- Pregnancy
- Stoma
 - 5X more common than if CIC per native urethra
 - 10X more common if CIC done per Mitrofanoff
- Vitamin B12
- Latex
- Cancer
- Incidence after augment 10-50%
- Higher incidence if with continent stoma
- 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 Caesarean → OB understand reconstructed anatomy
- Have urologist available if OB is unsure of the anatomy

Doyle BA, et al, Am J Obstet Gynecol 1988; **158**: 1131.

Hill DE, Kramer SA, J Urol 1990; **144(2 Pt 2)**: 457.

Creagh TA, et al: J Urol 1995; **154**: 1323.

Quenneville V, et al: BJU Int 2003; **91**: 893.

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

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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