Indications and Complications of Orthotopic Bladder Reconstruction

Seth P. Lerner, MD, FACS
Professor of Urology
Beth and Dave Swalm Chair in Urologic Oncology
Scott Department of Urology
Baylor College of Medicine
Houston, Texas

10th Urooncology Congress – Antalya, Turkey
October 26-30, 2011
Ideal Bladder Substitute

Kock’s Principles


- Reservoir with adequate capacity
  - La Place’s Law (pressure ≈ wall tension/radius)
  - Detubularize and fold into spherical shape
- No fecal contamination
- Complete and voluntary emptying
- No ureteral reflux
- No electrolyte absorption
Advantages of Small Bowel

- Lower pressures than colon
- Reliably reaches the urethra
- Facilitates taking ureters high (e.g. XRT, CIS)
- Low incidence ureteral stricture (4%)
- Urine is frequently sterile

NB. Very low incidence of late complications
Orthotopic Diversion
Patient Selection

- Normal external sphincter
- No cancer at apical urethral margin in men or bladder neck/urethra in women
- Motivated patient
- Do not routinely exclude:
  - Elderly patients
  - Prior irradiation
  - P3b, P4 or N+ patients
- Contraindicated in patients with regional ileitis
Orthotopic Urinary Diversion Experience in Women

- Patient selection critical
- Contraindications
  - Cancer at Bladder neck or urethra
- Preserve distal 2/3 of urethra and endopelvic fascia
- Increased incidence urinary retention requiring intermittent catheterization
Rationale for Urethral Preservation in Women

- Pelvic neuroanatomy
- Cancer involvement of the bladder neck and urethra

Do not dissect into or below the levators

A Few Tips on Surgical Technique
Papaverine - Relaxes Small Bowel

Start after completing cystectomy
Target: Lower systolic BP 10-15mm

Urology 33:431, 1989
Isolating the Bowel Segment

Ligasure simplifies the procedure

Divide the mesentery to the base of the “V”
Take an Additional 3-4cm Proximal Small Bowel

Additional blood supply for pouch
Close Butt end with TA Polysorb

Proximal bowel for anastomosis

Butt end

Absorbable staples
Mesentery Closure

Closing mesentery – do not tether the pouch

Pouch mesentery is dependent
Preparing new Bladder Neck

Most dependent portion is midpoint of right side

Left side is closed
Right side rotated toward urthra

Completed pouch

Afferent limb
Rusch Simplastic Foley 24F
Attach Stents to Catheter

- Wet pouch reduces mucous build-up
- Simplifies post-op management – no externalized stents
- Stents come out with Foley at 3 weeks post-op
Peri-operative Management

- Leave foley in for three weeks
- Irrigate prn to minimize risk of mucous accumulations and catheter obstruction
- Urine culture at 7-10 days
- Pouchogram at 2 weeks
  - Pre-tx with culture-specific antibiotics
- Cycle bladder for one week to passively expand the reservoir
- Remove foley at three weeks
Functional Outcomes

Continence

Daytime

59/69 (86%)

< 65 y.o. 37/42 (88%)

> 65 y.o. 22/27 (81%)

Night

37/68 (54%)

< 65 y.o. 26/41 (63%)

> 65 y.o. 11/27 (41%)

• Urinary retention in men is uncommon – consider pelvic recurrence
• Nocturnal incontinence due to loss of afferent input from detrusor to CNS and no corresponding increase in urethra resistance during filling
Functional Outcomes - Urinary Retention

• Why is it called “hypercontinence”?
• Requires intermittent catheterization
• Risk of pouch rupture
• May contribute to nocturnal incontinence
• Incidence
  – Male – 4-33%
  – Female – up to 69% ever requiring CIC; majority completely reliant
• NB: Must rule out local pelvic recurrence

Urinary Retention
How to Diagnose and Prevent

• Pouch retention – presents with crampy abdominal pain with non-specific bowel gas pattern on KUB
• Minimize redundancy in neobladder neck
• Omental pedicle between anterior vagina and neobladder
Urinary Retention
How to Diagnose and Prevent

- Pouch size 40cm vs. larger
- Suspend vaginal fornices to Cooper’s ligament
- Suspend vaginal apex to pre-sacral fascia
- Pelvic floor relaxation – biofeedback
  – Few reports

Ureter Anastamotic Strictures

- Prevention is key
- Incidence should be <5%
- Monitor with renal ultrasound at 4 months and annually
- Usually asymptomatic
- Early may be treated with dilation and stent
- Late (usually after 8-12 months) require incision, laser or open repair
Infection

• Pouchitis
  – Presents as a febrile UTI with low pelvic pain
  – May have gross hematuria
  – Limited to first 3-4 months after surgery

• Pyelonephritis
  – Must rule out obstruction
  – Monitor upper tracts by US or CT 4 months post op and annually
Bacteriuria

• 40% of patients chronically colonized
  – Usually asymptomatic – does not require Rx
  – May complain of foul smelling urine
  – May increase risk of pouch stone
  – Treat once with culture specific antibiotics then monitor
  – Educate primary care doctors not to treat
Physiology - Ileum and Colon

- Secretes sodium and bicarbonate
- Absorbs ammonium, hydrogen chloride
  - Ammonium is principle mechanism of acidosis
- Hyperchloremic metabolic acidosis
  - Total body potassium deficit
  - Hypocalcemia, hypomagnesemia, hyperamonemia
Physiology - Ileum and Colon

- **Symptoms**
  - Fatigue, anorexia, diarrhea

- **Treatment**
  - IV hydration plus bicarbonate
  - Potassium supplementation

J Urol 161:1057, 1999
Urologic Oncology 5:60, 2000
Metabolic Complications

Diarrhea

- Pathophysiology
  - Decreased absorptive capacity
  - Loss of ileocecal valve
  - Fat malabsorption
  - Bile salt irritation of colon

- Rx: Metamucil (adds bulk to stool)
  - Lomotil, Imodium, Cholestyramine
    - Absorbs bile salts
Metabolic Complications

- Malabsorptive B-12 deficiency – incidence requiring replacement 5%
  - Risk factors:
    - Loss of ileocecal valve and distal terminal ileum
    - Use of ≥ 50 cm. ileum
    - Radiation therapy
    - Takes 3-4 years to deplete B-12 stores; monitor annually; can occur earlier
    - Replacement can be parenteral or oral and should be initiated prior to symptoms
Metabolic Complications

• Cholelithiasis
  – Decreased bile acids causes lithogenic oversaturation of bile
  – Incidence: 9% with resection 30-50cm ileum
  – 35% with resection 100cm

• Osteoporosis
  – Mobilization of phosphate buffer from bone in chronic acidosis eg renal insufficiency
Metabolic Complications

• Renal calculi
  – Decreased bile acids; fat malabsorption and binding of intestinal calcium; increased oxalate
  – Chronic bacteriuria and struvite stones

• Reservoir calculi – usually form on foreign body
Secondary Cancers

CASE REPORT

ADENOCARCINOMA OF ILEAL NEOBLADDER
20 YEARS AFTER CYSTECTOMY
Secondary Cancers

• 81 tumors reported in literature review (J Urol 172:831, 2004)
• More common with augmentation cystoplasty
• Adenocarcinoma originating in bowel segment most common
When Using Colon for Orthotopic Neobladder

• Colonoscopy pre-op for at risk patients prior to colon reservoir procedures

• Highest risk in ureterosigmoidostomy
  – Contact of feces and urine (Science 207:1079, 1980)
  – After ten years: annual colonoscopy

• Recommend annual endoscopy of diversion starting at 3 years
Tesekkür Ederim