Everything You Wanted to Know About Urologic Emergencies But Were Too Afraid to Ask

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OBJECTIVES

1) Identify Urologic Emergencies as they relate to our patient population at Moffitt Cancer Center.

2) Distinguish between Inpatient and Outpatient Urologic Referrals.

3) Develop a basic understanding of management of hydronephrosis, hematuria and urinary retention.
Lower Urinary Tract Obstruction

Also referred to as Acute Urinary Retention (AUR)

Most common urologic emergency

Symptoms include:

- Suprapubic pressure/dullness
- Lower abdominal discomfort/pain
- Inability to pass urine

More common in men

Incidence increases with age

Chronic urinary retention is typically not associated with any pain
# Lower Urinary Tract Obstruction

## Table 1. Selected Causes of Urinary Retention

<table>
<thead>
<tr>
<th>Cause</th>
<th>Men</th>
<th>Women</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstructive</td>
<td>Benign prostatic hyperplasia; meatal stenosis; paraphimosis; penile constricting bands; phimosis; prostate cancer</td>
<td>Organ prolapse (cystocele, rectocele, uterine prolapse); pelvic mass (gynecologic malignancy, uterine fibroid, ovarian cyst); retroverted impacted gravid uterus</td>
<td>Aneurysmal dilation; bladder calculi; bladder neoplasm; fecal impaction; gastrointestinal or retroperitoneal malignancy/mass; urethral strictures, foreign bodies, stones, edema</td>
</tr>
<tr>
<td>Infectious and inflammatory</td>
<td>Balanitis; prostatic abscess; prostatitis</td>
<td>Acute vulvovaginitis; vaginal lichen planus; vaginal lichen sclerosis; vaginal pemphigus</td>
<td>Bilharziasis; cystitis; echinococcosis; Guillain-Barré syndrome; herpes simplex virus; Lyme disease; periurethral abscess; transverses myelitis; tubercular cystitis; urethritis; varicella-zoster virus</td>
</tr>
<tr>
<td>Other</td>
<td>Penile trauma, fracture, or laceration</td>
<td>Postpartum complication; urethral sphincter dysfunction (Fowler’s syndrome)</td>
<td>Disruption of posterior urethra and bladder neck in pelvic trauma; postoperative complication; psychogenic</td>
</tr>
</tbody>
</table>

*NOTE: For pharmacologic and neurologic causes of urinary retention, see Tables 2 and 3, respectively.*

*Information from references 1 and 5 through 7.*
Table 2. Pharmacologic Agents Associated with Urinary Retention

<table>
<thead>
<tr>
<th>Class</th>
<th>Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antiarrhythmics</strong></td>
<td>Disopyramide (Norpace); procainamide (Pronestyl); quinidine</td>
</tr>
<tr>
<td><strong>Anticholinergics (selected)</strong></td>
<td>Atropine (Atreya); belladonna alkaloids; dicyclomine (Bentyl); flavoxate (Urispas); glycopyrrolate (Robinul); hyoscyamine (Luvin); oxybutynin (Ditropan); propanteline (Pro-Banthine†); scopalamine (Transderm Scop)</td>
</tr>
<tr>
<td><strong>Antidepressants</strong></td>
<td>Amitriptyline (Elavil†); amoxapine; doxepin (Sinequan†); imipramine (Tofranil); maprotiline (Ludiomil†); nor triptyline (Pamelor)</td>
</tr>
<tr>
<td><strong>Antihistamines (selected)</strong></td>
<td>Brompheniramine (Brovex); chlorpheniramine (Chlor-TrimeHex); cyproheptadine (Periactin†); diphenhydramine (Benadryl); hydroxyzine (Atarax†)</td>
</tr>
<tr>
<td><strong>Antihypertensives</strong></td>
<td>Hydralazine; nifedipine (Procardia)</td>
</tr>
<tr>
<td><strong>Antiparkinsonian agents</strong></td>
<td>Amantadine (Symmetrel); benztropine (Cogentin); bromocriptine (Parlodel); levodopa (Larodopa†); trihexyphenidyl (Artane†)</td>
</tr>
<tr>
<td><strong>Antipsychotics</strong></td>
<td>Chlorpromazine (Thorazine†); fluphenazine (Prolixin†); haloperidol (Haldol); prochlorperazine (Compazine†); thioridazine (Melleril†); thiothixene (Navane)</td>
</tr>
<tr>
<td><strong>Hormonal agents</strong></td>
<td>Estrogen; progesterone; testosterone</td>
</tr>
<tr>
<td><strong>Muscle relaxants</strong></td>
<td>Baclofen (Lioresal); cyclobenzaprine (Flexeril); diazepam (Valium)</td>
</tr>
<tr>
<td><strong>Sympathomimetics (alpha-adrenergic agents)</strong></td>
<td>Ephedrine; phenylephrine (Neo-Synephrine); phenylpropanolamine; pseudoephedrine (Sudafed)</td>
</tr>
<tr>
<td><strong>Sympathomimetics (beta-adrenergic agents)</strong></td>
<td>Isoproterenol (Isuprel); metaproterenol (Alupent); terbutaline (Brethine†)</td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td>Amphetamines; carbamazepine (Tegegov); dopamine (Intropin†); mercurial diuretics; nonsteroidal anti-inflammatory drugs (e.g., indomethacin [Indocin]); opioid analgesics (e.g., morphine [Duramorph]); vincristine (Vincasar FFS)</td>
</tr>
</tbody>
</table>

*—Brand not available in the United States.
†—Levodopa is only available in combination drug products (e.g., carbidopa/levodopa [Sinemet]).
‡—Drug not available in the United States.

Lower Urinary Tract Obstruction

Diagnosis
- History
- Bladder Scan
- Bladder Ultrasound
- Catheterization

Inpatient vs. Outpatient
- Sepsis
- Malignant Obstruction
- Acute Myelopathy
- Acute Renal Failure

Post Obstructive Diuresis
Urinary Retention

Catheterization
- Difficulty with placement
- Coude catheters
- Contact urology for assistance with placement
- Straight catheter versus indwelling catheter

Voiding Trial
- Duration of catheter
- High volume retention
- Bladder scan post void to determine adequate emptying
- Bladder scan for bladder distention, pressure pain
Urinary Retention

Failed Void Trial
- Clean intermittent catheterization versus indwelling catheter replacement
- **Outpatient** referral
- Enlarged Prostate
  - Medications
  - Prostate Artery Embolization (PAE)
  - Transurethral resection of the prostate
- Urology at MCC does not see patients for urinary retention in clinic

Clean Intermittent Catheterization (CIC)
- Preferred Approach
- Should be performed every 4-6 hours
Types of Catheters

Standard
- Standard kits on floors 16 French and 18 French
- Straight tip
- Placement at Moffitt

Coude
- Bent/Angled tip
- Enlarged prostate
- Placement at Moffitt

Three-Way Catheter
- Catheter has an extra port for irrigation tubing
- Used to run continuous bladder irrigation
- Manual irrigation
- Placement at Moffitt
Upper Urinary Tract Obstruction/Hydronephrosis

Hydronephrosis is defined as dilation of the pelvis and calyces of one or both kidneys. This may result from obstruction to the flow of urine, vesicoureteral reflux, or it may be a primary congenital deformity without an apparent cause.
Upper Urinary Tract Obstruction/Hydronephrosis

Mechanical Obstruction
• Changes inside the urinary tract
• Changes outside the urinary tract

Symptomatic
• Renal colic
• Flank pain/pressure
• Costovertebral tenderness

Asymptomatic
• Incidental finding on imaging
• Normal renal function
• No pain or discomfort
Upper Urinary Tract Obstruction/Hydronephrosis

Diagnosis

- Normal renal function – preferred imaging CT Urogram
- Elevated creatinine
  - CT A/P without contrast
  - Renal/Bladder Ultrasound

Treatment

- Foley catheter
- Ureteral stent
- Percutaneous Nephrostomy Tube

Complete or prolonged obstruction can lead to tubular atrophy and eventually irreversible renal injury
Pyelonephritis

Symptoms
• Renal colic
• Fever
• Chills
• Dysuria
• Costovertebral tenderness

Diagnostic work up
• CBC w/diff, BMP, Urinalysis, Urine Culture, Blood Culture
• GU Imaging – CT A/P without contrast or CT Stone Protocol

Treatment
• Obstructive pyelonephritis requires urgent decompression of obstructed kidney
• No obstruction – medical management
Ureteral/Renal Stone

CT Stone Protocol
UA w/microscopic analysis
Urine culture
Lab studies

AUA Guidelines

- Less than or equal to 10mm - outpatient observation
- Distal stones – medical expulsive therapy (MET)

Obstructive pyelonephritis requires urgent decompression of obstructed kidney

Stent pain/colic
Stent failure
Hematuria – Microscopic

Asymptomatic microhematuria (AMH) is defined as three or greater red blood cells (RBC) per high powered field (HPF) on a properly collected urinary specimen and is not visible to the naked eye.

OUTPATIENT Work Up

- Imaging of upper urinary tract (CT Urogram is imaging of choice)
- Outpatient Cystoscopy

Risk factors for malignancy in patients with microscopic hematuria

- Older age
- Male gender
- History of cigarette smoking
- History of chemical exposure (cyclophosphamide, benzenes, aromatic amines)
- History of pelvic radiation
- Irritative voiding symptoms (urgency, frequency, dysuria)
- Prior urologic disease or treatment
- History of chronic indwelling catheters
- History of recurrent UTIs
Hematuria – Gross

Gross hematuria is visible to the naked eye

Urologic causes:
- Renal tumors (benign or malignant)
- Bladder tumors
- Prostate cancer
- Prostatic enlargement
- Renal or ureteral stones
- Trauma
- Urinary tract infections

Medical causes:
- Nephritis
- Anticoagulation
- Inflammatory conditions
Hematuria – Gross

Management depends on additional factors

Is patient in retention?
- Perform post void residual to determine if patient is emptying bladder
- If in retention consult Urology for further assessment and/or catheter recommendations
- Will likely require large, hematuria catheter
- May require three way catheter for continuous bladder irrigation

Is patient transfusion dependent?

Does patient have UTI?
- Ensure UA/Urine culture sent

Does urine clear with hydration?
- Establish history of symptoms with patient
- IV hydration
Hematuria – Cystitis

Contributing Factors

- Ifosfamide
- High-dose cyclophosphamide
- Pelvic radiation
- Hematopoietic stem cell transplant
- Intravesical instillation of BCG

Signs and Symptoms

- Mild hematuria
- Bladder irritation
- Gross hematuria
- Clot Hematuria
- Lower urinary tract symptoms (LUTS)
- Suprapubic discomfort
Hematuria – Cystitis

Diagnostics

• Work up will ultimately depend on clinical evaluation
• Not all work up will be completed inpatient, if needed may include
  • Urine culture
  • Urine cytology
  • Viral urine studies
  • Upper urinary tract imaging
  • Cystoscopy

Interventions

• Hydration
• Catheter if indicated
• Continuous bladder irrigation
BK Cystitis

Hemorrhagic cystitis (HC) is a frequent complication after HSCT

Primary risk factor for late onset HC is infection by BK virus

Diagnosis:

• Clinical symptoms of cystitis – dysuria, increased urinary frequency, lower abdominal pain
• Macrohematuria
• BK viremia with viral loads of >7 log10 copies/mL

Severity

• Based upon severity of hematuria
• Grade 1-4

Recommend ID Consult

• Cidofovir
• IV or Intravesical administration
• Limited research
Fournier’s Gangrene

Life threatening, necrotizing infection of the male or female perineum

Risk Factors

• Older men
• Diabetes
• Obesity
• AIDS
• Malignancy
• Alcoholism
• Smoking
• Renal failure
• Colorectal cancer
Necrotizing fasciitis of the perineum (Fournier's gangrene) can involve the scrotum. The infection can begin abruptly with severe pain and may spread rapidly.

*Reproduced with permission from Lawrence B Stack, MD.*
Fournier’s Gangrene

Local Symptoms
- Blisters
- Bullae
- Edema
- Subcutaneous gas
- Crepitus

Systemic Symptoms
- Hypotension
- Fever
- Tachycardia
- Shock

Treatment
- Broad spectrum antibiotics
- Extensive surgical debridement and drainage
- Hyperbaric oxygen treatment to reduce amount of debridement
- Vacuum assisted closure devices
Additional Urologic Emergencies

Priapism
Persistent penile erection that continues hours beyond or is unrelated to sexual stimulation and lasting for at least 4 hours

Penile Fracture
Occurs when the erect penis is forcibly bent, causing a rupture of the tunica albuginea of the corporal bodies of the penis

Testicular Torsion
Testicular torsion results from inadequate fixation of the lower pole of the testis to the tunica vaginalis. If fixation is absent or insufficiently broad-based, the testis may twist on the spermatic cord, potentially producing ischemia from reduced arterial inflow and venous outflow obstruction.
Additional Urologic Emergencies

Phimosis

- Abnormal constriction of the opening in the foreskin that precludes retraction over the glans penis, results from chronic inflammation and edema of the foreskin.
- Development of a phimosis often complicates sexual function, voiding, and hygiene. If the patient or medical staff forcibly retracts the foreskin, a paraphimosis (trapping of the foreskin) can occur.

Paraphimosis

- Emergent urologic condition in which the foreskin of an uncircumcised or partially circumcised male becomes retracted behind the coronal sulcus of the glans penis and will not return to its normal position.
- Untreated this can result in local skin necrosis, infarction, gangrene and autoamputation of the glans
Pathologic phimosis
Paraphimosis

Paraphimosis caused by excessive retraction of a physiologic phimosis in a male infant. Note the marked swelling at the coronal sulcus and the flaccid penile shaft.

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