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Disclosure Statement

Dr. Blount has nothing to disclose.
Learning Objectives

1. Know the work-up & Dx of hematuria.
2. Know the signs, Sx, Dx, & Rx of prostatitis and BPH.
3. Know the USPSTF recommendation for screening for prostate cancer.
4. Know the work-up & Dx of urolithiasis.

- U.I. will be covered in the Geriatrics session & UTI in STIs.
- Additional slides for your study: More details on the above topics + testicular pain.
1. Hematuria is defined as 2 of 3 samples with:

A. Any number of RBCs per hpf.
B. More than 3 RBCs per hpf.
C. More than 30 RBCs per hpf.
D. 3+ blood on urine dipstick.
E. Visibly red urine.
1. Hematuria is defined as 2 of 3 samples with:

A. Any number of RBCs per hpf.
B. More than 3 RBCs per hpf.
C. More than 30 RBCs per hpf.
D. 3+ blood on urine dipstick.
E. Visibly red urine.

- A. 15%
- B. 71% (Correct)
- C. 9%
- D. 4%
- E. 1%
Definitions

Hematuria is defined as three or more RBCs per high-powered field on urine microscopy, from 2 of 3 specimens.
Take-Home Point #1:

Positive dipsticks for blood should get microscopic confirmation.
Classification

CLINICAL
• Gross
  – Frankly bloody
• Macroscopic
  – Red urine
• Microscopic
  – Not discolored

PATHOPHYS
• Glomerular
• Non-Glomerular
# Age and Hematuria

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>Common</th>
<th>Uncommon</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-15</td>
<td>Glomerulopathy (IgA, Alport syndrome, thin BM disease, APSGN) Hypercalciuria with stones Congenital obstructive anomalies UTIs Sickle cell disease Viral infection</td>
<td>Factitious Fever HUS Hemophilia HSP Schistosomiasis</td>
</tr>
<tr>
<td>15-50</td>
<td>Calculi Menstrual contamination Exercise UTIs PKD Sickle cell disease Intercourse Papillary necrosis</td>
<td>AVMs or fistulae DIC Goodpasture’s syndrome Loin pain-hematuria syndrome Renal infarction Renal vein thrombosis Schistosomiasis Medullary sponge kidney</td>
</tr>
<tr>
<td>&gt;50</td>
<td>BPH Cancer (renal, ureteral, bladder, prostate) Overanticoagulation PKD Prostatitis</td>
<td>AVMs or fistulae Cyclic hematuria in women Endometriosis TTP Renal vein thrombosis Toxins (cantharidin, djenkol bean) LP-HS</td>
</tr>
</tbody>
</table>
Take-Home Point #2:

Most serious hematuria is going to be due to:

1. Infection (UTI, prostatitis)
2. Stones
3. Malignancy (anywhere along the urinary system)
Take-Home Point #3:

Look for “typical” clusters of symptoms and signs to quickly and roughly differentiate between infection, stones, and cancer.

If still unsure...
Back to the Microscope!

- Is it glomerular or non-glomerular?
- Glomerular: acanthocytosis (acantho- “thorn” or “spike”) or casts.
- Non-glomerular: isomorphomic RBCs.
2. A 62-yo WM C/O 2 months worsening difficulty starting urination with less force of stream & some dribbling.

PMH: Negative
PE: 30 cc prostate; rest: WNL
2. The next most appropriate step is:

A. Diagnose prostate cancer
B. Diagnose acute prostatitis
C. Diagnose benign prostatic hyperplasia
D. Check a PSA level
2. The next most appropriate step is:

A. Diagnose prostate cancer
B. Diagnose acute prostatitis
C. Diagnose benign prostatic hyperplasia
D. Check a PSA level
Benign Prostatic Hyperplasia

• Prevalence: 8% 31-40; 45% 51-60, & > 80% 80 YO

• Sx: LUTS: Reduced force of stream, hesitancy, terminal dribbling, sense of incomplete emptying, urgency, nocturia, frequency

• Complications: Acute urinary retention, recurrent UTIs, hydronephrosis, & renal failure
Benign Prostatic Hyperplasia

- Lifetime risk of surgery = 29%
- 2 components: Dynamic muscle tension & bulky structural
- Use AUA symptom scoring index* (Level C Rec)
  - Mild (score < 7): Watchful waiting
  - Moderate (score 8-19): Medical Rx
  - Severe (score > 20): Surgery

See [www.aafp.org/afp/20020701/77.html](http://www.aafp.org/afp/20020701/77.html) & end of H.O.
3. Which of the following meds would be inappropriate for this patient?

A. Saw palmetto
B. Alpha-1 antagonist
C. 5-Alpha reductase inhibitor
D. Ciprofloxacin
3. Which of the following meds would be inappropriate for this patient?

A. Saw palmetto
B. Alpha-1 antagonist
C. 5-Alpha reductase inhibitor
D. Ciprofloxacin

D. Ciprofloxacin is the correct answer.
BPH Meds

• Alpha-1 antagonists (5 approved): Similar efficacy; different side effect profiles: terazosin & doxazosin more SEs; dynamic component; they work: Level A Rec; Cochrane, 2008

• 5-Alpha reductase inhibitors (3 approved): Reduce size; need 6-12 MOs Rx for full effect; 3 approved with similar efficacy & S.E.s;
  – They work: Level A Rec; Cochrane, 2008
  – NNT for hematuria = 2; NNT to prevent a TURP = 6
BPH Meds

- Combination Rx MAY help: Level B Rec, Cochrane; (esp when > 30 cc volume)

- Saw palmetto is controversial & is no better than placebo (8/12)
Other BPH Treatments

• TUMT: transurethral microwave thermotherapy
• Is effective when there is:
  – No urinary retention
  – No previous prostate procedure
  – Prostate volumes between 30-100 mL
• Not as effective as TURP
• Cochrane, 2007

• Tadalafil (Cialis) Reason for improvement is unknown. Level B. Not for use with alpha-blockers
4. A 54-yo WM C/O 6 days of perineal pain, urgency & frequency, fever & myalgias. Never had before. The most likely Dx is:

A. Acute prostatitis
B. Cystitis
C. Chronic bacterial prostatitis
D. Chronic nonbacterial prostatitis
E. Urethritis
4. A 54-yo WM C/O 6 days of perineal pain, urgency & frequency, fever & myalgias. Never had before. The most likely Dx is:

A. Acute prostatitis 95%
B. Cystitis 1%
C. Chronic bacterial prostatitis 1%
D. Chronic nonbacterial prostatitis 1%
E. Urethritis 1%
Prostatitis

- Acute bacterial
- Chronic bacterial: in extra slides
- Chronic nonbacterial (CPPS): inflammatory & noninflammatory
Acute Prostatitis

• A type of UTI
• Sx: Fever, chills, LBP, perineal pain, dysuria, urgency, frequency, myalgias, ? obstructive Sx
• PE: Tender, warm, swollen, firm & irregular
• UA & C&S sans massage
Acute Prostatitis Rx

• Meds: Level C Rec
  – Tetracyclines
  – TMP-SMX
  – Quinolones

• Duration: 3-4 weeks; Level C Rec
Erectile Dysfunction

- ED is a robust predictor of all-cause mortality & CV events in men
  - Hazard ratio for mortality = 2.04
  - Hazard ratio for CV event = 1.62
  - With a “dose-response” increase with ED severity

- Bohm, Circulation, March 15, 2010
5. Which of the following is correct?

A. The 1st line treatment for E.D. is an oral phosphodiesterase 5 (PDE5) inhibitor.
B. The 1st line treatment for E.D. is yohimbine.
C. The 1st line treatment for E.D. is a vacuum device.
D. The 1st line treatment for E.D. is weight loss.
5. Which of the following is correct?

A. The 1st line treatment for E.D. is an oral phosphodiesterase 5 (PDE5) inhibitor. [66%]
B. The 1st line treatment for E.D. is yohimbine. [0%]
C. The 1st line treatment for E.D. is a vacuum device. [1%]
D. The 1st line treatment for E.D. is weight loss. [33%]
Erectile Dysfunction

- 1st line therapy should consist of oral phosphodiesterase-5 (PDE5) inhibitors: NNT = 2.1: Level A Rec, Cochrane, 2007
- PDE5 inhibitors are most effective in ED assoc with DM, spinal cord dysfunction, and ED caused by antidepressants: Level A Rec, Cochrane, 2007
- PDE5 inhibitors can help in ED in nerve-sparing prostatectomy: Level B Rec, Bandolier, 2005
- PDE5 inhibitor efficacy & side effects among the 4 are similar, but drop-out rates are lower for sildenafil: Level A Rec, Bandolier, 2005
Phosphodiesterase-5 Inhibitors: Adverse Effects

- Vision disturbances
- Priapism
- Angina
- Sudden, permanent sensorineural hearing loss (May, 2010)
Erectile Dysfunction

- Vacuum devices: Level B Rec, Bandolier, 2005
- Yohimbine: NNT = 6.4: Level A Rec, Bandolier, 2000
- Testosterone works in men with low testosterone (< 12 nmol/L), NNT = 2.1: Level A Rec, Bandolier, 2005
- Alprostadil works: NNT = 3.5; Is not a 1st-line agent 2/2 side effects: Level A Rec, Bandolier, 2005
- We don’t know about apomorphine, phentololamine, or intracavernosal VIP: Level I Rec, Bandolier
Erectile Dysfunction: What Else *Does* & *Doesn’t* Work

- Trazodone: NO. Level A Rec, Bandolier, 2005
- Fibrates & statins may contribute to ED: Level B Rec, Bandolier, 2007
- Having a BMI > 30 is a risk factor for ED: Level B Rec, Bandolier, 2000
- Losing weight in obese patients improves erectile function: Level B Rec, Bandolier, 2005
Prostate Cancer

Source: National Cancer Institute
Prostate Cancer Screening EBM

- USPSTF: “There is evidence against routine screening for prostate cancer by PSA or DRE.”
  2012 ‘D’ Rec

- This service has no benefit, or its harms outweigh its benefits.
Kidney Stones
Risk Factors

• Male Gender
• *Age (to 65)
• Low urine vol.
• Situational
• Geography
• Heredity
• Diet (high Na)
• Low urine volume
• Meds
Presentation

- Abdominal Pain
- Renal colic: Sudden; not relieved
- Hematuria
Relationship of Stone Location to Symptoms

- Renal colic, flank pain, upper abdominal pain
- Renal colic, dysuria, urinary frequency, anterior abdominal, & flank pain
- Vague flank pain, hematuria
- Renal colic, anterior abdominal & flank

Source: NIDDK
Work-Up

• History
• P.E.
• U.A.
• Imaging
• Labs
<table>
<thead>
<tr>
<th>Imaging modality</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noncontrast helical computed tomography</td>
<td>95 to 100</td>
<td>94 to 96</td>
</tr>
</tbody>
</table>

**Advantages**

- Most sensitive & specific radiologic test (i.e., facilitates fast, definitive diagnosis)
- Indirect signs of the degree of obstruction
- Provides information on non-genitourinary conditions

**Limitations**

- Less accessible and relatively expensive
- No direct measure of renal function
Management (3 Principles)

- Recognize emergencies
- Adequate analgesia
- Impact of size and location on Hx & Rx

Prevention (of Recurrences)

- Need to analyze calculi
- Labs
Summary

- Hematuria
- BPH
- Prostatitis
- Prostate cancer
- Urolithiasis
- Extras: Scrotal pain
1. USPSTF. Screening for Prostate Cancer. 2005.
Bibliography

Answers

1. B
2. C
3. D
4. A
5. A
Supplementary Slides
Not All Red Urine is Hematuria

- If the urine is visibly red, tea- or cola-colored, but there are < 3 RBCs/hpf, consider:
- Hemoglobinuria (false + dipstick)
- Myoglobinuria (false + dipstick)
- Beeturia
- Rhubarburia
- Medications (phenazopyridine, methyldopa, senna, others)
- Porphyria
RED FLAGS

- Smoking history
- Occupational exposure to chemicals or dyes (benzenes or aromatic amines)
- History of gross hematuria
- Age >40 years (>50, some sources say)
- History of urologic disorder or disease (not simple UTIs)
- History of persistent irritative voiding symptoms
- History of recurrent or chronic urinary tract infection
- Analgesic abuse
- History of pelvic irradiation

Source: Urology 2001;57(4)
Physical Examination

• Vitals
  • Fever? ? (pyelo) HTN?
    (glomerulonephritis)

• Heart
  • New murmur? (endocarditis)

• Lungs
  • Crackles, rhonchi?
    (Goodpasture’s syndrome)

• Abdomen
  • Masses? (cancer, obstruction)
    bruits? (renal ischemia)

• Extremities
  • Edema? (glomerulonephritis)
    rashes? (HSP, CTD, SLE)

• Rectal
  • BPH? nodules? (cancer)
    tenderness? (prostatitis, endometriosis)
6. A 7-year-old boy presents 2 weeks after an episode of pharyngitis because his mother noticed his urine was red. He has mild edema on examination.

A. Schistosomiasis  
B. Goodpasture’s syndrome  
C. Post-streptococcal glomerulonephritis  
D. Prostatitis
7. A 38-year-old woman with chronic pelvic pain presents with macroscopic hematuria. She has no fever, dysuria, or flank pain. She notes that her urine only turns dark red with or soon after her menstrual cycle.

A. Endometriosis
B. Exercise-induced hematuria
C. Polycystic kidney disease
D. Polycystic ovarian disease
E. Both B and C
If It’s Glomerular...

- Again: acanthocytes or casts in the sediment...
- If no protein or renal failure, you’re done for now.
  - But follow-up regularly!
- If protein or renal failure, refer to nephrology! (Renal biopsy likely.)
If It’s Non-Glomerular...

• Regular-appearing, isomorphic RBCs.
• Ask: “Where is the bleeding from?”
• Step 1: CT urogram. Look for the big anatomical lesions.
  • If no lesion, then--
• Step 2: Urine cytology (3 first AM samples)
  • if abnormal, go to cystoscopy.
• Step 3: Is the patient high risk for malignancy--over 40, toxic exposures, irradiation, etc.?
  • If yes, go to cystoscopy & consider repeat cytology at 6, 12, 24 and 36 months
Take-Home Point:

A. Glomerular or Not?
B. Glomerular - refer if protein or renal failure.
C. NonGlomerular - do a CT-U, then cytology (if needed), then see how worried you still are.
The Take-Home Points for Hematuria

- Positive dipsticks for blood should get microscopic confirmation
  - R/O myo- or hemoglobinuria and decide glomerular vs. non-glomerular.
- Top 3 suspects are infection, stones, and malignancy.
- Look for illness patterns:
  - Unilateral flank pain, afebrile, N/V (stones)
  - Obstructive Sxs, fever, prostate tenderness (prostatitis)
  - CVAT, fever, dysuria (pyelo)
- If no easy answer, ask: Glomerular or not?
  - Glomerular - protein or renal dz? If so, refer to nephrology.
  - Not - 1. CT-U; 2. Cytology; 3. Cystoscopy
### BPH Symptom Score

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all</th>
<th>&lt; 1 in 5 times</th>
<th>&lt; half the time</th>
<th>About half the time</th>
<th>&gt; half the time</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In the past month, how often have you had a sensation of not emptying your bladder completely after you finished voiding?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. In the past month, how often have you had to urinate again less than 2 hours after you finished urinating before?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. In the past month, how often have you found you stopped and started again several times when you urinated?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. In the past month, how often have you found it difficult to postpone urination?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
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<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. In the past month, how often have you had a weak urinary stream?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. In the past month, how often have you had to push or strain to begin urination?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. In the past month, how many times did you typically get up to urinate from the time you went to bed until you arose in the morning?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Scoring key:** 0 to 7 = mild; 8 to 19 = moderate; 20 or more = severe.

[www.aafp.org/afp/20020701/77.html](http://www.aafp.org/afp/20020701/77.html)
BPH Meds

- Terazosin, doxazosin, & alfuzosin work on all 3 receptor subtypes
- Tamsulosin relatively selects A & D
- Silodosin is relatively selective for A receptors
- Most common AE is dizziness: 2-14%; except for silodosin: Abnormal ejaculation in 10-22%
5-ARIs

- Not a firm recommendation but usually use 5-ARIs when prostate > 30 mL or PSA > 1.5 ng/dL
- AEs are primarily sexually related: dec. libido, abnormal ejaculation, & erectile dysfxn
Erectile Dysfunction

- Definition: The inability to achieve or maintain an erection sufficient for satisfactory sexual performance

- 18 million men in US
Erectile Dysfunction

- Principal neurotransmitter for erection is nitric oxide
- Regulated by cGMP
- Return to flaccidity, cGMP is hydrolyzed to GMP by PDE5
- ERGO: The PHE5 inhibitors
Chronic Bacterial Prostatitis

• Source of recurrent UTIs

• Similar Sx as Acute with ASx intervals

• WBCs + on pre- & post-massage UAs

• C&S neg on pre- & + on post-massage
Chronic Bacterial Prostatitis Rx

• TMP-SMX as 1st line: Level C Rec

• Quinolone for Rx failures: Level C Rec

• Rarely: TUP of infected tissue for very Sx complete failures on Abx
8. Which of the following is not true for Erectile Dysfunction?

A. PDE5 inhibitors work in men with nerve-sparing prostatectomy.
B. PDE5’s can cause a sudden, permanent sensorineural hearing loss.
C. Yohimbine works for ED.
D. Statins can improve ED.

Ans: D
9. You get a PSA result of 5.6 on a 51 YO WM. What is the next evidence-based step?

A. Repeat the PSA now
B. Repeat the PSA with a free %
C. Refer to urology
D. Repeat the PSA in 1 year
E. Do nothing
Positive Screen?

- Biopsy is the gold standard
- Transrectal BX (TRUS): Office procedure sans sedation or analgesia
Prostate Cancer

• Most common solid tumor among Am. men
• Around 200,000 diagnoses per year
• Risks:
  – Age, family Hx, & race
• Protection?: ?Lycopenes? Level C evidence; selenium: Level B Rec; Vit E: Level I Rec
• 5-Alpha reductase inhibitors: Yes: Level B Rec, Prostate Cancer Prevention Trial
Prostate Cancer Screening EBM

- ACP: Discuss with patients and individualize decision. C Rec, 2008
- ACS: Discuss with asymptomatic men with a life expectancy of > 10 years. Use informed, shared decision-making. “I”, 2010
Screening
(Extra Info)

- If screen, following are suggestions:
- Average risk men: annual PSA (with or without DRE) starting @ 50, until life expectancy < 10 yrs. PSA cutoff of 4 ‘C’ Rec
- African-American men & men with + F.Hx: As above, starting @ 45
- Newer PSA assays have not resulted in better patient outcomes. ‘B’ Rec
- If PSA < 2.5, can screen Q 2 yrs
Patient Discussion Points (Extra Info)

- PC is an important health concern
- Benefits of screening & aggressive Rx are not proven
- DRE & PSA have both false +s & -s
- High risk for further invasive evaluation
- Rxs associated with significant morbidity
- Early detection may save lives & avert cancer-related morbidity, but there is no proof for that
Kidney Stone Labs
All Patients

- CBC
- UA
- BMP
- Ca
- PO4
- Urate
- Urine C & S
- Stone Analysis
- Vitamin D
Kidney Stone Labs
Circumstantial

Hypercaclemia: PTH
Abnormal Albumin: Ionized Calcium
Hyperoxaluria: Oxalate level
Sarcoidosis: ACE level & calcitriol
Hospitalization for Stones?

- Emergencies
- Refractory nausea
- Debilitation
- Extremes of age
- Refractory pain
Analgesia

- NSAIDs: also spasmolytic
- Narcotics
- No NSAIDs < 3 days before lithotripsy (ASA < 7 days)
- Ketorolac
Manage the Stone

After adequate analgesia and ruling out emergencies

Principles here are stone size and location
Suggestions
SOR: C

Stones < 4 mm
• Passage in 1-2 wks (Most in 4-6 weeks)
• Analgesia
• Strain urine
• F/U KUB q 1-2 wks
• Urology if not passed in 2 wks. (certainly 4 wks as comps □3x)
• RTC signs of sepsis
Suggestions
SOR: C
Continued.

Stones < 5 mm or distal stones
• Medical therapy: alpha-blocker, &/or nifedipine
  SOR: A

Stones > 10 mm
• Urologic Consultation
  SOR: C

Stones  5 - 10 mm
• Decide based on other parameters
Other Parameters

- Location
- Composition
- Occupation
- Larger size
Location

- Renal stones usually can be followed
- Distal ureteral stones will usually pass

“Composition”

- Staghorn renal calculi to urology (assoc. with infections and kidney damage)

Occupation

- Pilots cannot fly even with an asymptomatic stone
Larger Size

- Renal calculi of 5 mm – 2 cm: Extra corporeal lithotripsy
- Lower pole stones 5 mm – 1 cm: ECL
- Ureteral stones 5 mm – 1 cm: ECL
- Larger than 2 cm or when ECL contraindicated or not effective: Renal & proximal ureteral stones: Percutaneous nephrolithotomy
To Urology

- Obstructed
- Infection
- Renal injury
- Solitary kidney

SOR: C
A Suggestion

Patient with abdominal pain

History and physical examination

Renal colic suspected

Diagnostic imaging

Patient is pregnant, or cholecystitis or gynecologic process is suspected

Patient has history of radiopaque calculi

All other patients
Ultrasound Examination

Plain-film radiography

Intravenous pyelography if CT is not available

Noncontrast helical CT

Stone detected

Stone not detected

Clinical suspicion of urolithiasis
24-hr. Urinary Tests

Volume
Calcium
Oxalate
Citrate
pH
Urate
Creatinine

Not done during acute stone

Do Twice
More Extensive Testing

- Children
- Solitary kidney
- CRI/CKD
- Residual stone burden
- Infected stones
- Gout
- Intestinal disease
Prevention

- All patients: 2-3 L water q day, 8-12 oz QHS (urine volume = 2 L/day)
  “B rec”
- ↓ NaCL (2g)
- ↓ Animal protein (8 oz)
- ↓ Oxalate
- ↑ Calcium in diet ‘B’ rec (to 1200 mg/day)
Risk for Renal Failure

- Hereditary stone diseases
- Struvite stones
- Infection associated calculi & obstruction
- Frequent relapses
- No. of urologic interventions
- Stone size
Causes of Scrotal Pain and Swelling

• Pain
  – Testicular torsion
  – Torsion of appendix testis
  – Epididymitis
  – Trauma
  – Orchitis and others

• Swelling
  – Hydrocele
  – Varicocele
  – Spermatocele
  – Tumor
Torsion

• Inadequate fixation of testes to tunica vaginalis at gubernaculum

• Torsion around spermatic cord
  – Venous compression to edema to ischemia
Epidemiology

- Accounts for 30% of all acute scrotal swelling
- Bimodal ages – neonatal (in utero) and pubertal ages
  - 65% occur in ages 12-18yo
- Incidence 1 in 4000 in males < 25 yo
- Increased incidence in puberty due to increased weight of testes
Predisposing Anatomy

Bell-clapper deformity

- Testicle lacks normal attachment at vaginalis
- Increased mobility
- Transverse lie of testes
- Typically bilateral
- Prevalence 1/125
Torsion: Clinical Presentation

- Abrupt onset of pain – usually testicular, can be lower abdominal, inguinal
- Often < 12 hrs duration
- May follow exercise or minor trauma
- May awaken from sleep
  - Cremasteric contraction with nocturnal stimulation in REM
- Up to 8% report testicular pain in past
- May have N&V
Torsion: Examination

- Edematous, tender, swollen
- Elevated from shortened spermatic cord
  - Horizontal lie common (PPV 80%)
  - Reactive hydrocele may be present
- Cremasteric reflex absent in nearly all (unreliable in < 30 mo old) (PPV 95%)
- Prehn’s sign (elevation relieves pain in epididymitis and not torsion) is NOT reliable
Intermittent Torsion

- Intermittent pain/swelling with rapid resolution (seconds to minutes)
- Long intervals between symptoms
- PE: testes with horizontal lie, mobile testes, bulkiness of spermatic cord (resolving edema)
- Often evaluation is normal – if suspicious need GU follow-up
Diagnosis – “Time is Testicle”

• Ideally -- prompt clinical diagnosis
• Imaging: secondary to clinical exam
  – Color doppler – decreased intratesticular flow
    • False + in large hydrocele, hematoma
    • Sens 69-100% and Spec 77-100%
    • Lower sensitivity in low-flow pre-pubertal testes
• Nuclear technetium-99 radioisotope scan
  – Show testicular perfusion
  – 30-min procedure time
  – Sens and spec 97-100%
Management

- Detorsion within 6hr = 100% viability
  - Within 12-24 hrs = 20 – 50 % viability
  - After 24 hrs = 0 - 10% viability

- Surgical detorsion and orchiopexy if viable
  - Contralateral exploration and fixation if bell-clapper deformity

- Orchiectomy if non-viable testicle

- Never delay surgery on assumption of nonviability, as prolonged symptoms can represent periods of intermittent torsion
Manual Detorsion

- If presents before swelling
- Appropriate sedation
- In 2/3rds of cases testistorses medially, 1/3rd laterally
- Success if pain relief, testes lower in scrotum
- Still need surgical fixation
Neonatal Torsion

- 70% prenatal, 30% post-natal
- Post-natal typically 7-10 days after birth
- Unrelated to gestation age, birth weight
- Post-natal presents in typical fashion
  - Doppler U/S and radionucleotide scans less accurate
    with low blood flow in neonates
  - Surgical intervention if post-natal
- Prenatal torsion presents with painless testicular swelling, rare testicular viability
  - Rare intervention in prenatal torsion
Torsion of Appendix Testis

- Appendix testis
  - Small vestigial structure, remnant of Mullerian duct
  - Pedunculated, 0.3 cm long
- Other appendix structures
- Prepubertal estrogen may enlarge appendix and cause torsion
Torsion of Appendix Testis

- Peak age 3-13 yo (prepubertal)
- Sudden onset, pain less severe
- Classically, pain more often in abd or groin
- Non-tender testicle
  - Tender mass at superior or inferior pole
- May be gangrenous, “blue-dot” (21% of cases)
- Normal cremasteric reflex, may have hydrocele
- Inc or normal flow by doppler U/S
Torsion of Appendix Testis

• Management supportive
  – Analgesics, scrotal support to relieve swelling

• Surgery for persistent pain
  – No need for contralateral expl.
Epididymitis

- Inflammation of epididymis
- Subacute onset pain, swelling localized to epididymis, duration of days
  - With time, swelling and pain less localized
- Testis has normal vertical lie
- Systemic signs of infection
  - Inc WBC and CRP, fever + in 95%
- Cremasteric reflex preserved
- Urinary complaints: discharge/dysuria PPV 80%
Epididymitis

- Sexually active males
  - Chlamydia > N. gonorrhea > E. coli
- Less commonly pseudomonas (elderly) and tuberculosis (renal TB)
- Young boys, adolescents often post-infectious (adenovirus) or anatomic
  - Reflux of sterile urine through vas into epididymis
  - 50-75% of prepubertal boys have anatomic cause by imaging
Epididymitis Diagnosis

- Leukocytosis on UA in ~40% of patients
- PCR Chlamydia + in 50%, GC + in 20% of sexually active
- 95% febrile at presentation
- Doppler and nuclear imaging show increased flow
- If Hx consistent with STD, CDC recommends:
  - Cx of urethral discharge, PCR for C and G
  - Urine culture and UA
  - Syphilis and HIV testing
Epididymitis Treatment

- Sexually active treat with ceftriaxone/doxycycline or ofloxacin
- Pre-pubertal boys
  - Treat for co-existing UTI if present
  - Symptomatic Tx with NSAIDs, rest
  - Referral all to GU for studies to rule out VUR, post urethral valves, duplications
- Negative culture has 100% NPV for anomaly