27 – Epididymitis, Orchitis, and Prostatitis

Speaker: Barbara Trautner, MD

IDBR INFECTIOUS DISEASE BOARD REVIEW LIVE/VIRTUAL AUGUST 19-23 2023

Prostatitis, Epididymitis, and Orchitis

Barbara Trautner, MD, PhD
Professor of Medicine
Baylor College of Medicine

6/25/2023

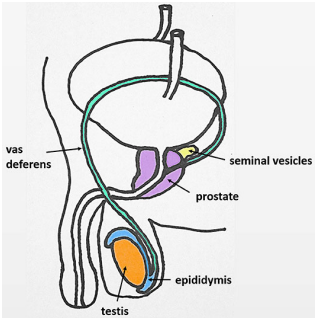
IDBR INFECTIOUS DISEASE BOARD REVIEW LIVE/VIRTUAL AUGUST 19-23 2023

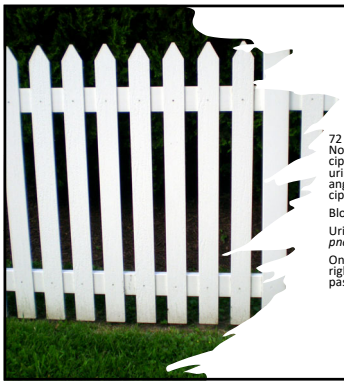
Disclosures of Financial Relationships with Relevant Commercial Interests

- **Consultant:**
  - **Genentech for COVID treatment trial**
  - **Peptilogics for prosthetic joint infection trial**
  - **Shionogi for COVID treatment trial**
- **Research Funding: Genentech**

Overview

- Epididymitis
- Prostatitis
  - Acute
  - Chronic
- Prostate biopsy
- Orchitis





Case #1

72 year-old man presented to ER with fever, urinary retention. No culture sent. Sent home with transurethral catheter and ciprofloxacin. Walks into ID clinic one month later with the urinary catheter is still in place. Temp 102.5, costovertebral angle tenderness present on exam. Admitted and started on ciprofloxacin.

Blood cultures: *Serratia marcescens (sensitive to cipro)*

Urine cultures: *Serratia marcescens and Klebsiella pneumoniae (both sensitive to cipro)*

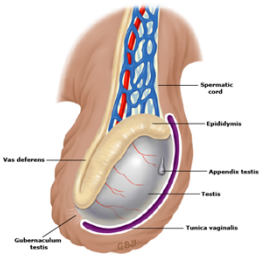
On hospital day 2, he is still febrile to 102.3, and he reports right testicular pain/swelling. He says this was present for the past 7 days but is more obvious now.

Case #1 continued

Given his fevers on 2 days of ciprofloxacin, and the new awareness of right testicular pain and swelling, your next step is to:

A. Add vancomycin to cover enterococci
B. Order a scrotal ultrasound
C. Add doxycycline for coverage of sexually transmitted infections
D. Consult urology emergently for testicular torsion

Normal testicular anatomy



The testicle is vertical and its anterior portion is surrounded by the tunica vaginalis.

UpToDate

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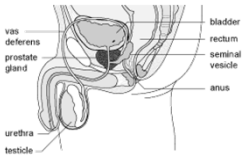
Epididymitis: Clinical Presentation

- Testicular pain, swelling, and tenderness
- Scrotal erythema
- Fever
- Dysuria or other urinary irritative symptoms
- Urethral discharge
- Reactive hydrocele can occur
- Epididymo-orchitis if testes also inflamed
- Gradual onset (if sudden, consider testicular torsion)
- Cremasteric reflex is preserved

Risk factors for epididymitis

- Insertive anal intercourse
- Urinary outlet obstruction
- Prostate biopsy
- Urinary tract instrumentation
- Immunosuppression



Workowski et al, Sexually Transmitted Infections Treatment Guidelines, 2021
Recommendations and Reports / Vol. 70 / No. 4
UpToDate Acute Scrotal Pain in Adults

Etiologic agents of epididymitis

>14 and < 35 years of age: typically sexually transmitted

- *Neisseria gonorrheae*
- *Chlamydia trachomatis*
- *Mycoplasma genitalium*

Chronic or atypical

- *Mycobacterium tuberculosis*
- *Brucellosis*
- *Nocardia*
- *Blastomycosis*

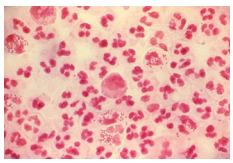
> 35 years of age: enteric flora or spread from urine

- *Escherichia coli*
- *Klebsiella*
- *Proteus*
- *Pseudomonas*
- Enterococci

McGowan, Chapter 110, in Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases, 9th edition

Workup of epididymitis

- Physical exam
  - Intact cremasteric reflex
  - Testes in normal location
  - No draining sinus
- Gram stain of urethral secretions
- Urinalysis and urine culture
- Nucleic acid amplification test (NAAT) of urine
  - *N. gonorrhoeae*
  - *C. trachomatis*
- Consider blood cultures
- Failure to improve within 48-72 hours
  - Scrotal ultrasound
- Call urology if concern for torsion



https://en.wikipedia.org/wiki/Neisseria_gonorrhoeae

Gram stain of urethral discharge

Differentiating epididymitis from torsion

Table 1. Selected Differential Diagnosis of Acute Scrotum

Condition	*Typical presentation*	*Examination findings*	*Ultrasound findings*
Epididymitis	Gradual onset of pain that occasionally radiates to the lower abdomen; symptoms of lower urinary tract infection	Localized epididymal tenderness that progresses to testicular swelling and tenderness; normal cremasteric reflex; pain relief with testicular elevation (Prehn sign)	Enlarged, thickened epididymis with increased blood flow on color Doppler
Orchitis	Abrupt onset of testicular pain	Testicular swelling and tenderness; normal cremasteric reflex	Testicular masses or swollen testicles with hypoechoic and hypervascular areas
Testicular torsion	Acute onset of pain, usually severe	High-riding transversely oriented testis; abnormal cremasteric reflex; pain with testicular elevation	Normal-appearing testis with decreased blood flow on color Doppler

Trojian, American Family Physician, 2009

Treatment of epididymitis

- If patient is low risk for sexually transmitted infection
  - Levofloxacin or trimethoprim-sulfamethoxazole—for enterics
- If risk for sexually transmitted infection
  - And NO insertive anal intercourse
    - Ceftriaxone—for *N. gonorrhoeae*
    - Doxycycline (azithro as alternative)—for *C. trachomatis*
  - And YES insertive anal intercourse
    - Ceftriaxone—for *N. gonorrhoeae*
    - Fluoroquinolone (can cover for chlamydia)—for enterics
- For all: scrotal elevation and cold packs

UpToDate Acute Scrotal Pain in Adults
MMWR Vol. 70, No. 4,2021
Trojian, American Family Physician, 2009

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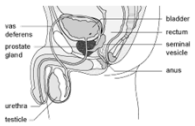
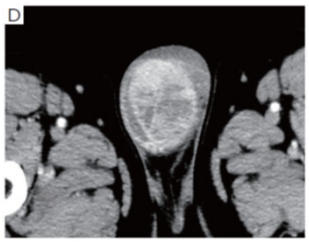
Epididymitis: Management and Complications

- Medical management
  - Antibiotics
  - NSAIDS
  - Scrotal elevation and ice packs
- Complications
  - Testicular infarction
  - Scrotal abscess
  - Epididymo-orchitis



Case #2

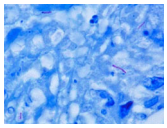
- 63 year-old man currently living homeless in Houston presented with a gradually enlarging, painful right testicle over the past 4 months
- Afebrile and he has thickened right scrotal skin but no fistula on exam
- WBC 15,000; negative HIV, AFP, RPR, and beta-HCG
- CT with contrast shows uneven enhancement of right testes and epididymis; the left epididymis was also enlarged with diffuse enhancement
- What test would you NOT do next?
  - A. TB spot
  - B. Urine culture for AFB
  - C. Testicular biopsy
  - D. Urine PCR for TB



Li, Chen, Fang et al, Quant Imaging Med Surg 2021; 11(6)

Tuberculous epididymo-orchitis

- Genitourinary TB typically starts in the epididymis
- Hematogenous or contiguous spread (direct from sexual contact)
- Presents as painful scrotal mass
- Imaging may reveal bilateral involvement
- TB testing often positive
- Diagnosis: AFB stain, culture, and PCR of urine
  - Consider also prostatic secretions
- Avoid fine needle biopsy if any concern for germ cell tumor
- Fistulas, abscesses, and infertility can result if untreated



Yadav et al, Transl Androl Urol 2017
Liu et al, Surgical Infections 2021
Li et al, Quant Imaging Med Surg 2021

Prostatitis NIH Consensus Categories

- I Acute bacterial* prostatitis
- II Chronic bacterial* prostatitis
- III Chronic prostatitis/chronic pelvic pain syndrome
  - IIIA Inflammatory
  - IIIB non-inflammatory
- IV Asymptomatic inflammatory prostatitis
  - Incidental finding, no need to treat

*includes non-bacterial pathogens, such as fungal organisms

Understanding the Prostatitis NIH Consensus Categories

Condition	Bacteriuria	Localized to Prostate	Abnormal Rectal Exam	Systemic Illness
I Acute Bacterial Prostatitis	+	+	+	+
II Chronic Bacterial Prostatitis	+	+	–	–
III Chronic Pelvic Pain Syndrome	–	–	–	–
IV Asymptomatic Inflammatory Prostatitis	–	–	+/–	–

McGowan, Chapter 110, in Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases, 9th edition

Understanding the Prostatitis NIH Consensus Categories

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Case #3

A 69 year-old man presents with pain in the lower abdomen, rectum, and perineum for the past 48 hours. He has chills and nausea in addition to urinary urgency, frequency, and dysuria. Gentle digital rectal examination finds a painful and swollen prostate. He has not been able to pass urine for the past 10 hours.

Management should include:

A. Nitrofurantoin
B. Urology consultation for catheterization
C. Culture of expressed prostatic secretions
D. PSA (prostate specific antigen) levels

Acute bacterial prostatitis: clinical presentation

- Acutely ill patient
- Prostatic tenderness is the distinguishing feature
- Fever, chills, irritative urinary symptoms
- Lower abdominal, rectal, or perineal pain
- Voiding difficulties
- Pathogenesis: from infection in the urinary tract, prostate biopsy, or hematogenous spread
- Risk factors: urinary catheters, urinary stasis, urinary instrumentation

UpToDate Acute Bacterial Prostatitis
Brede and Shoskes, Nat Rev Urol 2011

Infectious prostatitis: Causative agents

Acute > 60% caused by

- *Escherichia coli*
- *Proteus*
- Other Enterobacterales
- *Pseudomonas*
- Staph, strep, enterococci
- *Salmonella typhi* (HIV)
- Burkholderia (traveler to SE Asia or N. Australia)
- STI: gonorrhea or chlamydia

Chronic or immunocompromised

- Mycobacteria
- Fungal
  - Cryptococcus
  - Histoplasma
  - Aspergillus
  - Coccidioidomycosis
  - Candida
  - Blastomycosis

Diagnostic workup of prostatitis

- Physical exam
  - Painful prostate
- Urinalysis and urine culture
- Consider blood cultures
- Failure to improve within 48-72 hours
  - Prostate ultrasound, computed tomography (CT) scan, MRI
- Call urology if unable to void

Antibiotic treatment of acute bacterial prostatitis

- Most common pathogens are *E. coli* and other Enterobacterales
  - Microbiologic causes are very diverse
- Acute prostatitis
  - Start broad—cephalosporins, carbapenems, +/-aminoglycoside
  - Treatment duration 2-6 weeks
- Oral options: fluoroquinolones, sulfonamides, tetracyclines, macrolides, fosfomycin all penetrate the prostate
- Chronic prostatitis
  - Duration unclear—4, 6, 12 weeks all reported

Lipsky et al, Clinical Infect Dis 2010
Schaeffer and Nicolle, NEJM 2016
Chou et al, Drugs 2022
Brehm, ID Clin North America 2023
UpToDate Chronic Bacterial Prostatitis

Case #4

INFECTIOUS DISEASE BOARD REVIEW AUGUST 18-23 2023 **PREVIEW QUESTION**

A 72 year-old man presents with pain in the perineum, penile tip, and scrotum, which has been going on for the past three months. He had lower back pain a week ago, but the pain has since subsided. He has had two episodes of UTI with burning on urination in the past six months. On physical examination, his prostate is boggy and tender to palpation.

What is the most common cause of a chronic form of this condition?

A. Herpes
B. Chlamydia
C. *E. coli*
D. Candida

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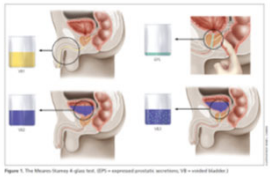
Chronic bacterial prostatitis

- Patients not acutely ill
- Recurrent UTI with same organism is common
- The four-glass Mears-Stamey test is cited often
- In practice urologists more often do the two-glass test
  - Urine samples pre/post prostatic massage



Sharp et al, Am Fam Physician 2010

Case #5

A 58-year-old man presents with fever and shaking chills the day after undergoing transrectal prostate biopsy for possible prostate cancer. Prior to the biopsy, he had received one dose of oral ciprofloxacin.

In the emergency department, his temperature is 101.5, and he has rigors. He reports rectal pain and difficulty voiding. His creatinine is normal. Blood and urine cultures are sent. Which of the following antibiotics would be **an appropriate choice**?

A. Amikacin
B. Fosfomycin
C. Ciprofloxacin
D. Trimethoprim-sulfamethoxazole

Antibiotic prophylaxis for prostate biopsy

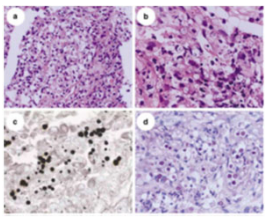
- Strongly recommended
- Pre-procedure antibiotics reduce the risk of bacteriuria, symptomatic UTI, bacteremia, fever, acute prostatitis, hospitalization
- No one best choice
- Options include fluoroquinolones, TMP/SMX, gentamicin, and ceftriaxone
- One dose, one hour to the procedure
- No benefit seen for enemas prior to procedure
- Infection after biopsy often caused by fluoroquinolone-resistant *E. coli*

Zani et al, Cochrane Review, 2011

Case #6

A 55-year-old man with HIV/AIDS (CD4 32) was referred to urology for obstructive voiding symptoms. Prostate exam revealed asymmetric enlargement. Urinalysis and urine culture unremarkable. Ultrasound showed bilateral nodules consistent with malignancy. Biopsy revealed:

A. Candida
B. E. coli
C. Cryptococcus
D. Aspergillus
E. Nocardia



Wada et al, Prostate Cancer and Prostatic Dis 2008
Adams et al, Urology 1992
Wise and Shteynshlyuger, Curr Urology Rep 2006

Case #7

INFECTIOUS DISEASE BOARD REVIEW AUGUST 19-23 2023 **PREVIEW QUESTION**

A 35 year-old man who is a member of a religious group that does not support vaccination attended a wedding in Nebraska. Two days later he developed pain in his left ear and jaw tenderness. Eleven days later he had noticeable swelling under both sides of his jaw, fever, and painful swelling of his left testicle. The likely causative agent is:

A. Mumps
B. Measles
C. Escherichia coli
D. Neisseria gonorrhea

Orchitis (isolated involvement of testes)

- Viral infections are common
  - Mumps
  - Coxsackie B
  - Lymphocytic choriomeningitis
- Bacterial
  - Contiguous spread from epididymis
  - Same organisms as epididymitis
    - *E. coli* and other enterics
    - Also same rare organisms (TB, fungal)

https://www.environmentandsociety.org/arcadia/mumps-post-secondary-environment-targeted-advertising-2007-2008-alberta-mumps-vaccination

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To Wrap Up:

- Epididymitis
  - Consider sexually transmitted infection versus *E. coli* and other enteric flora
- Prostatitis
  - Consider acute bacterial prostatitis in men with febrile UTI—detected by physical exam
  - Consider chronic bacterial prostatitis in men with recurrent or relapsing UTI
- Fungal, TB, and other indolent organisms (Brucella) can invade and infect the male genitourinary tract
- Isolated orchitis is rare in adults—consider viral etiology

Is everything clear now?

- trautner@bcm.edu
- @bwtrautner