UROLOGY
Pearls and Summaries

Illustrations are from Campbell’s Urology and Smith’s General Urology
The Evaluation of the Urological Patient

A careful history is critical
You must think in terms of differential not only definition
Urology covers patients of widely different age.
History will guide the multifaceted diagnostic technology available in Urology.
The Association For Surgical Education

Objectives

Dx of patient who presents with pain or mass in scrotum

Testicular vs extratesticular origins

Discuss benign vs malignant causes

Discuss emergent vs non-emergent causes

Discuss the management of cryptorchid testis
The Association For Surgical Education

Objectives:

Scrotal Pathology

Anatomy of scrotal contents - embryological development and descent of the testicle
Case In Point

• Twelve year old male presents to you at three AM in the E.R. with a history of awakening with severe unrelenting pain in his left scrotum. He was struck in the scrotum by a soccer ball the previous afternoon but was able to return to the game. He has a swollen left scrotum on physical exam. What is your diagnosis?
TORSION
Acute Scrotum

Differential Diagnosis

TORSION - always consider
Epididymitis
Trauma
Tumor
Mullerian Remnant
TORSION

Pearls

Acute Scrotum = Torsion!!!! 1st. Dx.
  Cremasteric reflex status?
  Orientation of epididymis?
  Relief by elevation?
  Shortened cord?
  Hx. Trauma does NOT R/O!

Operate if ANY Doubt because you have six hours! – Bilat. Exploration!
Scrotal Pathology
Pearl

• Ischemic pain does not relent unless flow is restored or end organ becomes necrotic
Epididymitis
Scrotal Pathology
Pearls

Epididymitis – STD? – anomaly in child
1/3 testis tumors present as epididymitis

Relief of pain by elevation of the testis (Prehn’s sign)

Rx. Elevation – ice - antibiotics – Spermatic cord block
Torsion of Appendix Testis

“BLUE DOT” sign upon transillumination
Mullerian Remnant
Scrotal Pathology

SCROTAL SWELLING IS AN EMERGENCY!!!!!!!! IF TORSION IS SUSPECTED REFER TO UROLOGIST IMMEDIATELY!!!
Scrotal Pathology Essentials

Differential Dx. - Non-acute

1. Hydrocoele
2. Spermatocoele
3. Hernia
4. Testicular Tumor
5. Varicocoele
6. Cryptorchid testis
Differential Diagnosis of Scrotal Masses Which Transilluminate
Varicocele
Scrotal Pathology Pearls

- Hydrocoele = transilluminates – testis palpably separate? – r/o hernia
- Spermatocoele = transilluminates – Clearly from head of epididymis
- Varicocele – should disappear upon recumbence – beware R if solitary
- Testis tumor – ANY mass in the substance of testis is cancer until proven otherwise
Case In Point

Scott Hamilton, Olympic Gold Medalist, began having severe abdominal pain while on tour with ‘Stars On Ice” Had had hx. of sporadic pain before but thought it was due to “junk food.” CAT scan showed retroperitoneal mass and Px. Showed testicular mass. How do we diagnose, evaluate and treat. What are the risk factors? Survival odds?
SEMINOMA
Testis Cancer
Essential Concepts

Disease of young men
Rare in African-Americans
Presents as mass in testis – can present as acute scrotal problem
95% are malignant germ cell tumors
Cryptorchid testis major risk
Testis Tumors

Types
- Seminoma
- Embryonal Cell
- Teratoma
- Choriocarcinoma  survival rare
Embryonal Cell Carcinoma
Testis Tumors
Essential Concepts

Diagnosis

• Physical exam
• Ultrasound –
  • DO NOT BIOPSY!! – EVER!!
• Markers - serum
  Beta HCG
  Alpha Fetoprotein
Testis

Due to relationship of Metanephros to the Gonadal Ridge:

1: pain refers from testis to flank and abdomen – T-12 & L-1
2: primary testicular nodal drainage is to renal level
Testis Tumor

- Treatment
  - Radical Inguinal Orchiectomy = ALL
  - Seminoma – XRT to retroperitoneum for stage 1
  - Embryonal – Retroperitoneal Lymphadenectomy for stage 1
  - Surveillance for stage 1 is an option
  - Platinum based chemo. Highly effective
Cryptorchid Testis

- Incidence higher with premature birth
- Spontaneous descent most likely in first year – testosterone surge
- Retractile vs true lack of descent
- Increased incidence of Ca. & Infertility
Remember to FIRST trap testis by placing finger at the internal ring.
Crytorchid testis always has asso. hernia
HYPOSPADIAS - PEARLS

Incidence = 1/500

The more distal the urethral opening the less likely is Intersex

In newborn consider adrenal hyperplasia

UDT + Hypospadias – think Intersex

Do Not Circumcise

Repair by age one
Circumcision

In male neonate it confers a 10xs advantage in avoiding urinary tract infection. It decreases the risk of penile cancer but risk is slight. Most are done for social or religious reasons. Indicated by infection or paraphimosis.
Circumcision
Paraphimosis

- Reduce by pressure on glans-then circ
- True phimosis is unusual
- Do not manually open foreskin adhesions to glans unless you plan to circ.
CASE IN POINT

- A five year old white female presents to you with a history of fever, flank pain, and dysuria. She has had several episodes of fever as an infant, which was diagnosed as URI. Is this latter history important? What do you do? Does this problem have any import to the patient when she becomes an adult?
Pediatric Urology

• Pearls Hx. & Px.
  • Hx. Febrile UTI = workup in child - 30% will have reflux and 30% will have a renal scar – in a male child, esp. neonate, likely to have congenital anomaly - REMEMBER - cystitis is an afebrile disease
Urinary Tract Infection

- More common in females after first six months
- Infection in male neonate = anomaly
- Multiple UTIs in childhood = 50% incidence of intercourse related infection & >ASB in pregnancy
- Female perineal defense is key
- 85% of UTIs are e-coli
REFLUX NEPHROPATHY

Little girls with renal scarring have a 10-15% chance of developing toxemia of pregnancy. Much higher incidence of ASB of pregnancy, due to perineal colonization.

Bottom line: Recurrent urinary tract infections in childhood predict a subset of women who will have complications of pregnancy.
REFLUX-NEPHROPATHY

Hypertension

11 % incidence

Sir David Innes-Williams

Bottom line: Renal scars are noted in @ 1/3 of little girls evaluated for urinary tract infection and a significant number will have hypertension
Pediatric Urology

Reflux

Diagnosis - by ultrasound in fetus and neonate
- during evaluation of UTIs with VCUG
REFLUX
Pediatric Urology

Reflex Management

Depends upon grade of reflux, age, and ability to control infection

1. Suppression with antibiotics and follow – dose = 1/3 dose/day
2. Surgical repair >95% success
REFLUX NEPHROPATHY

SURGICAL CORRECTION OF REFLUX DOES NOT CHANGE THE INCIDENCE OF URINARY TRACT INFECTION. URINARY TRACT INFECTIONS RESULT FROM COLONIZATION, REFLUX IS A CONDUIT AND IN MANY CASES THE RESULT OF ANOTHER PROBLEM.
URINARY TRACT INFECTION

Pearls

- 85% of adult female cystitis is intercourse related. 85% are due to e-coli. If there are no complicating factors you may Rx. recurrent intercourse related cystitis with one dose of nitrofurantoin or Bactrim post intercourse.

- Three days is usually adequate Rx. For acute uncomplicated cystitis.
Urinary Tract Infection
Pearls

E-coli most likely in all ages
Patient should be asymptomatic in 48 - 72 hours. If not consider:

Wrong antibiotic or poor renal function or perfusion = urine level

Foreign body - stone for example

Closed space infection - obstruction or abcess
URINARY TRACT INFECTION
Pearls

• Most recurrent cases of cystitis are re-infection not infection inadequately treated

• You must consider urine levels of antibiotic when considering sensitivity

• Choosing a broader spectrum antibiotic is poor Rx., in recurrent UTI, unless C&S demands it.
Hematuria

Gross – emergency in neonate
Always check perineum, foreskin, or meatus
Lower Urinary Tract Symptoms
LUTS

• Irritative Sxs
  • Frequency – alone = volume
  • Urgency + Frequency - think unstable bladder, neurological lesion, aging, Ca. In Situ
• Dysuria - think infection
  • stranguria in infant with hematuria - think sarcoma
PAIN Pearls

• Suprapubic pain unrelated to the act of voiding is not usually GU in origin
• Suprapubic pain relieved by the act of voiding is usually Interstitial Cystitis
• Suprapubic pain worsened by voiding suggests UTI
Pediatric Urology

• Pearls Hx. & Px
• REMEMBER – Irritative urinary sx(s) may be indication of sexual abuse.
Enuresis

Nocturnal bed wetting, in < 6y/o, without additional sxs does not demand evaluation.

Association with UTI hx. = workup

Diurnal sxs. = consider workup

“Curtsy sign” = consider workup
Pediatric Urology

- Pearls Hx & Px
- Bowel function hx. is critical, esp. in children with dysfunctional voiding and urinary tract infection. Constipation must be corrected in these instances.
CASE IN POINT

• A thirty-five year old male presents to you with severe episodic right flank pain which radiates to the right testicle. He has a history of passing two ureteral calculi over the last four years. He has no fever or history of UTI’s. How do you evaluate and manage?
Obstructing right ureteral stone
Three points where ureteral stone is likely to become impacted:

1. UPJ
2. Crossing Vessels
3. UV Junction
Figure 3-1. Referred pain from kidney (dotted areas) and ureter (shaded areas).
PEARL UROLITHIASIS

• Frequency and urgency in absence of fever, usually means stone in lower ureter and has passed the upper two points of obstruction.
UROLITHIASIS

- 10% of U.S. residents will have a stone
- One stone = 50% recurrence in 5 yrs
- 30-50 yrs most likely age of onset
- Males are more likely but “fast food” diet is lowering ratio
UROLITHIASIS

• Stone types
• Calcium oxalate = 70%
• Uric acid = 7%
• Struvite = 7%
• Cystine
UROLITHIASIS

- Spiral, non-contrast, CAT is the most useful study with acute stone. A plain KUB should accompany the CAT.
UROLITHIASIS

• Essential concepts
  – Fluid intake
  – Diet – sodium- holidays-”fast foods”- acid ash
  – Ca/Oxalate ratio-decrease Ca can increase Oxalate absorption
  – Urine components-24 hour urine
  – Systemic diseases-Sarcoid-Parathyroid
UROLITHIASIS

- 50-60% calcium oxalate pts. have hypercalciuria
- Most useful drugs
  - thiazides
  - k citrate
Staghorn calculus usually due to Proteus infection
More common in females - Never due to e-coli.
Must remove all of the stone! - antibiotics
UROLITHIASIS

Uric acid stone

Allopurinol

Low purine diet?

Ph manipulation - Uric Acid stones are very sensitive to Ph changes. Form in acid urine.

May be nidus for Ca/Oxalate Stone
UROLITHIASIS

Initial studies You can not make radical changes in a stone patient without:
Stone analysis
Blood = Cr, K, Bicarbonate, Ca., P., Uric acid, (PTH only if ca elevated in blood or urine)
Urine 24 hr.- volume, Ph, Cr., Ca., Na., K, Oxalate, Uric acid, Citrate, P., Magnesium, Sulfate, C&S
PEARLS - UROLITHIASIS

Red Meat is a major hazard in stone former
Na can block thiazide hypocalciuric effect
Atkin’s diet = >acid ash = >stone risk
Citrate excretion higher in women
elevated by lemonade + K citrate
Cola beverages have as much oxalate as tea
UROLITHIASIS

Drugs

thiazide
furosemide
carbonic anhydrase inhibitor
guaifenesin- ephedrine addicts
indinavir
UROLITHIASIS

Options

Observation
Eswl
Endoscopy
Open surgery
UROLITHIASIS

Pearls

• 0.5 cm stone will usually pass
UROLITHIASIS

- Endoscopy
  - Cystoscopy
  - Ureteroscopy
  - Percutaneous
Non-obstructing left renal stones
Flank mass in child = urological origin
Think:
1. UPJ,
2. MCDK,
3. Reflux
4. Wilm’s and Neuroblastoma
Ureteropelvic Junction Obstruction
Ureteropelvic Junction Obstruction

• Diagnosis
  Usually via ultrasound esp. in neonates
  “Beer drinker’s” = usually extrinsic obstruction
  Nuclear scans help delineate severity
U.P.J.

- Watchful waiting based on DMSA scan in a select population
- Surgery is demanded by hx. Infection, pain, significant functional compromise.
- Dismembered pyeloplasty treatment of choice in children – success rate > 95%
Pediatric Urology
Abdominal Mass

- Pearls Hx. & Px.
- Aniridia or hemihypertrophy DEMAND workup for Wilms
- Mass in abdomen of child which is smooth and mobile likely hydronephrosis r/o Wilms – non-moveable mass crossing midline likely Neuroblastoma
Pediatric Urology

• MCDK = Multicystic Dysplastic Kidney
• Common cause of flank mass in neonates.
• Check function with DMSA scan
  If no function follow with ultrasound
• Function = Rx debated
Pediatric Urology

Pearls Hx. & Px.

Suprapubic mass – think distended bladder

Consider PUV and neurogenic bladder