Diagnosis and Management of the Acute Scrotum

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By Anas Hindawi, Urology Resident
Moderated by Dr. Khalid Al Sayyid
Introduction

• The acute onset of pain, tenderness or swelling of the scrotum or its contents is collectively referred to as the acute scrotum
Differential diagnosis

• Among broad differential, Urological emergencies include:
  
  – Testicular torsion
  – Fournier’s gangrene
  – Traumatic injury
Differential diagnosis

- TT can be intravaginal vs extravaginal

- Can be intermittent, days to months to spontaneous resolving

- TAT or TET may induce ischemia and pain of the appendage
Differential diagnosis

• Inflammation of epididymis or epididymo-orchitis typically progresses from a less severe localized epididymitis

• Causes include:
  – Adults $\rightarrow$ enteric uropathogens, STD’s
  – Paediatrics $\rightarrow$ poorly defined
  – Genitourinary abnormalities
  – Enterovirus, adenovirus, trauma
Differential diagnosis

- Isolated orchitis → systemic vasculitis /henoch shonlein purpura, behcet disease/ , viruses /mumps, TB/

- TB of epididymis accounts 10-35% of GU TB
Differential diagnosis

- Communicating and non communicating hydrocele can become inflamed and cause acute scrotum

- Varicocele might present with pain, swelling & thrombosis

- Testicular, pratesticular masses and metastasis should be considered in scrotal mass

- Trauma /ruptured vs non ruptured/, referred pain
Epidemiology and age based consideration

• The majority of ED visits for acute scrotum in children are TT, TAT & EO

• TT 83 % of acute scrotum episodes in neonates and infants

• TT 33-39 % of acute scrotum in adolescents

• In prepubertal boys:
  – TAT 46-70 %
  – TT 3-16 %
  – EO 11-32 %
Epidemiology and age based consideration

- EO is more common in postpubertal due to onset of sexual activity
- N. Gonorhea and C. Trachomatis in younger than 35 yrs
- Enteric uropathogens in more than 35 yrs
History & Physical Exam

• 1st modality of evaluation Hx & P.E

• S I R O D C A S P

• GU history
  – Trauma
  – UTI’s
  – Anomalies
  – Previous episodes
• Onset in TT vs TAT ,EO

• Associated symptoms TT vs TAT ,EO

• Gradual onset of pain with swelling ,epididymal tenderness & Dysuria ??!!
• Physical exam must establish discomfort status & distress

• Starting from least painful areas with abdominal assessment ?!!!

• Genital exam:
  – Inspection
  – Cremasteric reflex (present vs absent) ?!!!
  – Palpation (testis, epididymis & spermatic cord)
  – Trasnilliumination vs Doppler Ultrasound
  – Sacral spine inspection
History & Physical Exam

• Clinical factors for testicular torsion:
  
  – Pain duration less than 24 hrs
  – Nausea/Emesis
  – Absent Cremasteric reflex
  – Abdominal pain
  – High position of testis (Bell-Clapper deformity)
  – Prhen’s sign
History & Physical Exam

- TAT (Testicular Appendicular Torsion) gradual onset of pain, less nausea/emesis
- Cremasteric reflex?
- Tenderness?
- Blue dot? %?

- TOT vs EO
  - Dysuria and tender epididymis?
  - Positive blue dot?
  - Fever?
History & Physical Exam

• Inguinal reducible hernia might present with scrotal pain
• Non reducible hernia ?!

• Testicular Mass & Scrotal pain ?!

• Haematocele & Trauma ?!
• Hydrocele & pain ?!

• Skin & soft tissue infection ?!
Diagnostic Evaluation

- DUS is the single most adjunct to Hx & P.E in Acute Scrotum evaluation
  - Confirms emergencies (TT, ruptured albuginia)
  - Confirms urgencies (Masses)
  - Blood flow (sens. 70-100%, spec. 88-100%, PPV 100%, NPV 97%)
  - Expertise dependent
  - Equivocal result ?!
Acute torsion / whirlpool sign of spermatic cord

Right spermatic cord: Edematous spermatic cord with anechoic structures “dilated lymphatic vessels”

Right testis: Absence of color flow

Left testis: Reactive hydrocele, Scrotal wall thickening

Diagnostic Evaluation

- CT scan in Fournier suspected
- Testicular or Paratesticular mass?! Labs?!
- Suspected referred pain? Imaging?

- Labs are used to identify Acute Bacterial EO from Uropathogens and STD
Diagnostic Evaluation

• U.A & U.Cx should be performed in pediatrics to identify bacterial infections, GU anomalies & Enteric communications

• Viral serology & Haematologic examination in Viral & Vasculitis associated Orchitis

• Nucleic acid amplification tests in sexually active patients
Operative management

- Testicular torsion
- Fournier gangrene
- Testicular rupture
- Testicular trauma ?!
- Testicular/Paratesticular mass ?
Operative management

• Surgical exploration confirms:
  – TT 51-77 %
  – TAT 23-25 %
  – EO 4-9 %

• TT with exploration in > 12 hrs had salvage rate < 60%, Atrophy >40%

• Salvaged testicle should be monitored 6-12 months for atrophy documentation
Operative management

• Torsed Testis:
  – Ischaemic appearance
  – Bluish hue
  – Swelling
  – Bell clapper deformity

• Warm vs Ice appliance

• Orchietomy & Orhiopexy?
Operative management

- TAT ?
- Hernias, Hydrocele
- Trauma, Gunshots, large or expanding Haematoma
- Haematomas $< \text{vs} > 5\text{cm ?!}$
- Abscesses ?
- Infection spreads along fascial planes
- Testicular masses staging can be delayed in normal tumor markers
Non-Operative management

- Manual De-Torsion evident by
  - Relief pain
  - Testicular return to its position
  - Blood flow return on DUS
- 1/3 will retain a degree of torsion
- Scrotal exploration has to be done
Non-Operative management

• EO treatment is age dependent

  – Sexually active: 250 mg ceftriaxone IM once, 100 mg Doxycycline po bid/10 days

  – >35 yrs: 500 mg Levofloxacin po daily/10 days OR 300 mg Ofloxacin po bid/10 days

  – Anal course engaged ?!
Non-Operative management

- EO in prepubertal rarely bacterial, mainly supportive
- Positive urine cultures, 7-10 days po Abx
- 47% of children with EO had GU anomalies
- TAT
- Viral, vasculitis associated orchitis, scrotal idiopathic edema
Testicular torsion

- Px.: acute pain, nausea, vomiting, high riding testicle
- Dx.: absent flow on DUS
- Tx.: surgical exploration, bilateral orchiopexy, possible orchiectomy
Appendage torsion

- Px.: gradual pain, focal tenderness, blue dot sign
- Dx.: testicular flow on DUS
- Tx.: observation, activity restriction, NSAID’s
Epididymo-orchitis

- **Px:** gradual pain, epididymal tenderness, scrotal erythema

- **Dx:** testicular flow on DUS, U/A & U/Cx, age < 35, STD testing

- **Tx:**
  1. Prepubertal: scrotal support, NSAID’s
  2. Age < 35: Ceftriaxone/Doxycycline
  3. Age > 35: Levofloxacin
Fournier Gangrene

- Px: fever, scotal erythema, crepitus
- Dx: abscess on DUS, wound cultures, CT
- Tx: wide local debridement(s), parenteral antibiotics, close monitoring
Orchitis (viral, vasculitis, TB)

- Px: fever, testicular pain, scrotal erythema, Parotits (mumps), Purpura (Henoch-Schönlein)

- Dx: testicular flow on DUS, viral serology

- Tx: activity restriction, NSAID’s (if viral), Glucocorticoids (vasculitis), antibiotics (TB)
Inguinal hernia

- **Px**: gradual pain, hernia on exam
- **Dx**: hernia sac without/with omentum or bowel on DUS
- **Tx**: manual reduction, surgical repair
Trauma

• Px : traumatic event , scrotal swelling

• Dx : DUS with testicular flow , hematoma

• Tx : scrotal exploration for testicular rupture or large hematoma
Hydrocele/hematocele

- **Px**: scrotal swelling
- **Dx**: fluid or blood filled sac on DUS
- **Tx**: observation, surgical correction
Varicocele

• Px: bag of worms

• Dx: large veins on DUS

• Tx: surgery for symptomatic cases or Infertility
Testicular/Paratesticular mass

• ** Px : mass on exam , gradual onset 

• ** Dx : mass on DUS , tumor markers 

• ** Tx : orchiectomy , surgical excision
Idiopathic scrotal edema

- **Px**: scrotal swelling, gradual onset
- **Dx**: normal DUS
- **Tx**: observation, scrotal support
Referred pain

• Px: non focal exam, non tender scrotum

• Dx: normal DUS, consider CT scan

• Tx: evaluation for retroperitoneal pathology
Thank You