

AUA  
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Washington, DC

MAY 15-18

## The Scrotal Playbook: Hydrocele, Varicocele & Testicular Pain

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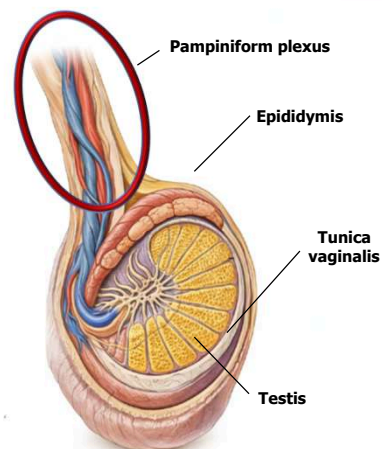
MAY 15-18

## Disclosures

Keenova Pharmaceuticals- Speaker's Bureau  
UroGPO- Consultant  
Boston Scientific- Consultant  
Marius Pharmaceuticals- Consultant  
Coloplast- Consultant  
Tolmar Pharmaceuticals- Consultant

- Common complaint
- Wide differential
- Medico-legal risk
- Fertility implications

- Testis
- Epididymis
- Tunica vaginalis
- Pampiniform plexus



*American Urological Association. Medical Student Curriculum: Acute Scrotum.*

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- History
- Physical exam
- Imaging
- Labs
- Risk stratification

**Varicocele**

- Dull, aching pain
- Worse with standing
- Improves when supine

**Hydrocele**

- Usually painless
- May cause heaviness or discomfort if large

**Chronic Scrotal Content Pain (Orchialgia)**

- Pain >3 months
- Often multifactorial:
  - Neuropathic
  - Pelvic floor dysfunction

**Post-Vasectomy Pain Syndrome (PVPS)**

- Intermittent or chronic
- May be congestion-related

**Referred Pain**

- Ureteral stones
- Spine pathology
- Nerve entrapment

**Testicular Tumor**

- Usually painless mass
- Occasionally dull ache or heaviness

Pain ***DOES NOT*** exclude malignancy

- Sudden pain
- N/V
- High-riding testis
- Absent reflex

**Acute Causes (High Priority — Rule Out First)**

**Testicular Torsion (Emergency)**

- Sudden, severe unilateral pain
- Nausea/vomiting
- High-riding testicle
- Absent cremasteric reflex

**Time-Sensitive Surgical Emergency**

- Color Doppler US is the modality of choice and highly accurate for torsion
  - Absence of flow = diagnostic
  - Whirlpool sign classic
- ↓ or absent intratesticular blood flow (Doppler)
- Enlarged, hypochoic testicle (early)
- Heterogeneous testicle (late)
- **“Whirlpool sign”**



URL: <https://www.eurorad.org/case/7120>  
DOI: 10.1594/EURORAD/CASE.7120

- **Necrosis (Death of the Testicle)**
- **Orchiectomy**
- **↓ Fertility/Infertility**
- **Atrophy**
- **Psychological Impact**
- **Why Immediate Treatment is Critical:**
  - **< 6 hours:** 90–100% chance of saving the testicle
  - **12+ hours:** 50% or lower chance of saving the testicle
  - **24+ hours:** ~10% chance of saving the testicle

### STEP 1 Rule Out Torsion FIRST

- High suspicion = IMMEDIATE surgical exploration
- **DO NOT** delay for imaging

### STEP 2 — Focused History

- Onset (sudden vs gradual)
- Severity and progression
- Urinary/STI symptoms
- Trauma
- Sexual history
- Prior surgeries (vasectomy)

### STEP 3 — Physical Examination

- Inspect & palpate
  - Testicle
  - Epididymis
- Assess
  - Cremasteric reflex
  - Testicular position
- Perform
  - Transillumination
  - Valsalva (varicocele)

### STEP 4 — Risk Stratification

#### High-Risk Features

- Sudden onset severe pain
- Abnormal lie
- Systemic symptoms
- Treat as torsion until proven otherwise

### STEP 5 — Diagnostic Testing

#### • Scrotal Ultrasound with Doppler

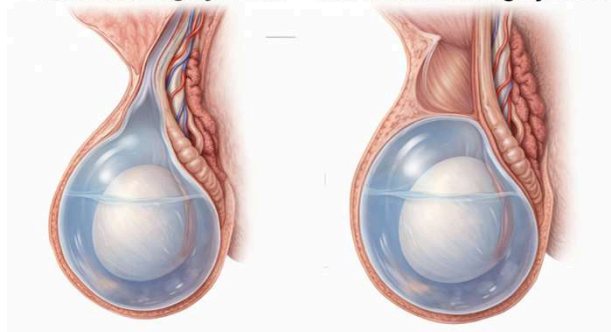
- First-line imaging when:
- Diagnosis unclear Torsion not obvious

#### • Labs

- UA ± culture
- STI testing (GC/CT)

- Fluid in tunica vaginalis
- Communicating vs Non-Communicating

Communicating Hydrocele      Non-Communicating Hydrocele



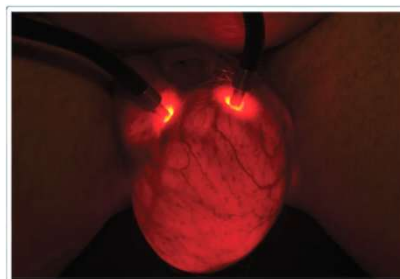
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- Painless Scrotal Swelling (Most Common)
- Gradual enlargement of one side of the scrotum
- Usually non-tender
- May fluctuate in size (communicating)
- Sensation of Heaviness or Fullness
- “Dragging” sensation and/or Scrotal heaviness
- More noticeable with prolonged standing or activity
- Scrotal Enlargement (Variable in size)
- Cosmetic concerns
- Difficulty with clothing or activity (“Fit” & “Freedom”)

- Clinical Examination
- Transillumination
- Ultrasound if exam unclear



[https://www.researchgate.net/figure/Normal-clinical-photograph-showing-hydrocele-of-the-left-testicle\\_fig1\\_322157282](https://www.researchgate.net/figure/Normal-clinical-photograph-showing-hydrocele-of-the-left-testicle_fig1_322157282) [accessed 22 Mar 2026]



[https://www.researchgate.net/figure/Photograph-showing-transillumination-of-hydrocele-of-the-left-testicle\\_fig2\\_322157282](https://www.researchgate.net/figure/Photograph-showing-transillumination-of-hydrocele-of-the-left-testicle_fig2_322157282) [accessed 22 Mar 2026]

- No dedicated adult AUA Guideline
- Management based on:
  - AUA educational resources
  - Urologic practice patterns
  - Review literature
- Core principle:  
**Individualized, symptom-driven decision making**

Huzajfa M, Moreno MA. Hydrocele. [Updated 2023 Jul 3]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK559125/>

Hoang VT, Van HAT, Hoang TH, Nguyen TTT, Trinh CT. A Review of Classification, Diagnosis, and Management of Hydrocele. *J Ultrasound Med.* 2024 Mar;43(3):599-607. doi: 10.1002/jum.16380. Epub 2023 Nov 27. PMID: 38010662.

- Asymptomatic hydrocele
- Small, stable size
- No functional limitation
- Testicle **clearly palpable and normal**
- No suspicion for:
  - Tumor
  - Hernia
  - Infection
- **Most adult hydroceles can be safely observed**
- Pain or discomfort
- Sensation of heaviness
- Large size interfering with:
  - Activity
  - Clothing
- Cosmetic concern
- Progressive enlargement
- **Symptoms drive intervention—not presence alone**

Huzajfa M, Moreno MA. Hydrocele. [Updated 2023 Jul 3]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK559125/>

- Inability to palpate testicle
- Diagnostic uncertainty
- Suspicion of:
  - Testicular tumor
  - Inguinal hernia
  - Hematocele / pyocele
- **Ultrasound and surgical evaluation warranted**
  - This is where most medico-legal issues arise.

**Pediatric:**

- Often resolve spontaneously
- Observe initially
- Surgery if:
  - Persistent (>2–3 years)
  - Enlarging
  - Associated with hernia

**Adult:**

- Rarely resolve
- Treat based on symptoms and impact

Jobson M, Hall NJ. Current practice regarding timing of patent processus vaginalis ligation for idiopathic hydrocele in young boys: a survey of UK surgeons. *Pediatr Surg Int*. 2017 Jun;33(6):677-681. doi: 10.1007/s00383-017-4085-4. Epub 2017 Apr 19. PMID: 28424863; PMCID: PMC5434128.

### Hydrocelectomy (Gold Standard)

- Definitive
  - Low recurrence
- Hydrocelectomy:
- 16% moderate/severe complications
  - ~5% reoperation rate
  - ~25% unplanned postoperative visits

### Aspiration ± Sclerotherapy

- Less invasive
  - Higher recurrence
- Consider in poor surgical candidates
- Aspiration/sclerotherapy:
- ~40–50% recurrence

*Mäki-Lohiluoma L, Kilpeläinen TP, Järvinen P, Söderström HK, Tikkinen KAO, Sairanen J. Risk of Complications After Hydrocele Surgery: A Retrospective Multicenter Study in Helsinki Metropolitan Area. Eur Urol Open Sci. 2022 Jul 19;43:22-27. doi: 10.1016/j.euros.2022.06.008. PMID: 36353068; PMCID: PMC9638760.*

Observe If:

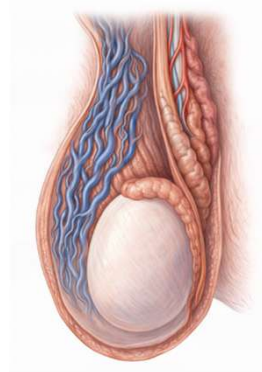
- Asymptomatic
- Testicle Clearly Normal (examination)

Operate If:

- Symptomatic
- Enlarging
- Functionally Limiting
- Uncertain Diagnosis (Ultrasound)

Hydrocele surgery is indicated for symptoms, size, progression, or uncertainty —  
Not simply for the presence of fluid.

- Dilated veins
  - “Bag of worms”
- Infertility
- Hormonal Impact



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- Common cause of male infertility
- Primarily a **clinical diagnosis**
- Management guided by:
  - American Urological Association (AUA)
  - American Society for Reproductive Medicine (ASRM)
  - European Association of Urology (EAU)
- Focus: **fertility, symptoms, and emerging hormonal role**

- Physical exam = **gold standard**
  - Standing + Valsalva
- Graded I–III (clinical)
- **Ultrasound indications:**
  - Equivocal exam
  - Recurrent/persistent symptoms
  - Infertility workup
- Doppler criteria:
  - Veins >3 mm
  - Reflux >2 seconds

*AUA/ASRM Male Infertility Guideline; EAU Male Infertility Guideline*

- Clinical Grading System (Dubin & Amelar)
- **Grade 0 (Subclinical):** Not palpable or visible, but detected on ultrasound or specialized imaging (veins >3 mm in diameter).
- **Grade I (Small):** Palpable only when the patient performs the Valsalva maneuver (bearing down).
- **Grade II (Medium):** Palpable at rest while standing, but not visible.
- **Grade III (Large):** Clearly visible through the scrotal skin at rest, causing visible deformity.

Majzoub A, Sabanegh E Jr. Symptomatic male with subclinical varicocele found on ultrasound evaluation. Asian J Androl. 2016 Mar-Apr;18(2):313-4. doi: 10.4103/1008-682X.170864. PMID: 26696438; PMCID: PMC4770506.

Bertolotto M, Cantisani V, Drudi FM, Lotti F. Varicocele. Classification and pitfalls. Andrology. 2021 Sep;9(5):1322-1330. doi: 10.1111/andr.13053. Epub 2021 Jun 8. PMID: 34038625; PMCID: PMC8596817.

- **Clinical (palpable):**
  - Eligible for treatment consideration
- **Subclinical (US only):**
  - **DO NOT** treat
  - Strong consensus across AUA/ASRM and EAU

- Treat ONLY if ALL present:**
- Palpable varicocele
  - Infertility
  - Abnormal semen parameters
    - This is the **highest evidence-based indication**

- ↑ Pregnancy rates
- ↑ Sperm concentration
- Variable effect on motility/morphology
- Benefit greatest in:
  - Unexplained infertility
  - Favorable female partner factors

- Persistent scrotal pain
- Adolescent testicular asymmetry (>20%)
- Selected Non-Obstructive Azospermia (NOA) cases (controversial)
- Pain improvement:
  - ~50–90% after surgery

- Subclinical varicocele
- Normal semen analysis
- Asymptomatic incidental finding
- Avoid overtreatment

**Preferred:**

- Microsurgical varicocelectomy
  - Lowest recurrence
  - Lowest hydrocele risk

**Alternatives:**

- Laparoscopic
- Percutaneous embolization
- Microsurgery = gold standard

- **Emerging evidence:**
  - ↑ Testosterone post-repair (~80–100 ng/dL avg)
- **Mechanism:**
  - Improved Leydig cell function
- NOT yet a primary AUA indication
- Recent meta-analyses; EAU acknowledges evolving role

- **Consider repair if:**
  - Clinical varicocele
  - Symptomatic hypogonadism
    - Low testosterone (appropriate evaluation)
  - Desire to avoid TRT
    - Shared decision-making required

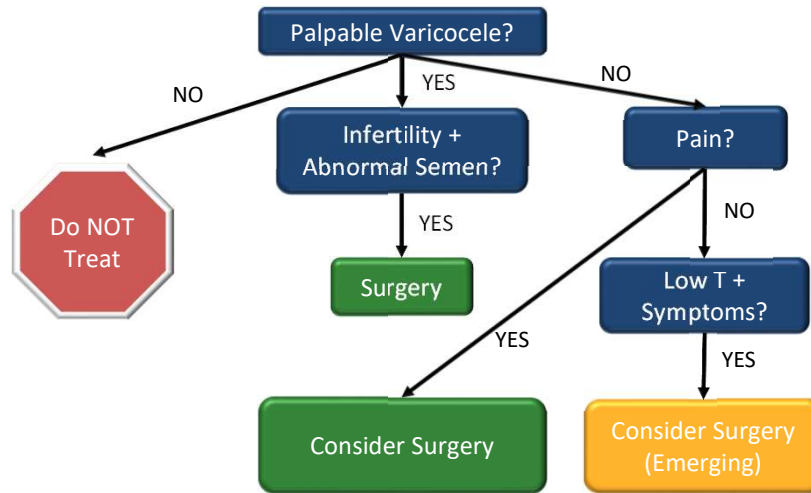
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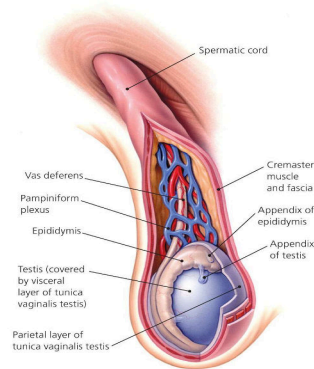
- **Mechanism:**

- Improved Leydig cell function
- NOT yet a primary AUA indication

- Heterogeneous studies
- Limited RCT data
- Not universally effective
- Still **emerging indication—not standard of care**



- Inflammation of epididymis ± testicle
- Common cause of acute scrotal pain
- Typically, infectious
- Differentiate from torsion



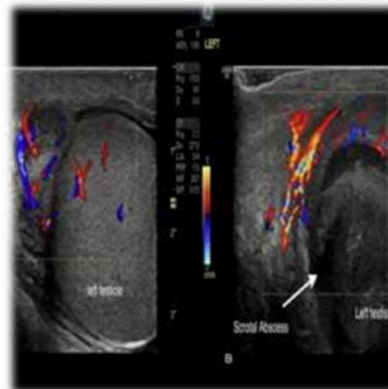
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- <35 or STI risk: Chlamydia, Gonorrhea
- >35: Enteric organisms (E. coli)
- Instrumentation, catheter, BPH

- Gradual unilateral pain
- Dysuria, frequency
- Fever possible
- Tender epididymis, normal testicular position
- Cremasteric reflex present

- Clinical diagnosis
- UA ± culture
- GC/CT testing
- Ultrasound if torsion unclear

- Enlarged epididymis
- Increased blood flow
- Possible hydrocele
- ↑ flow = infection vs ↓ flow = torsion



[https://www.researchgate.net/figure/a-Initial-doppler-ultrasound-showing-enlarged-left-epididymis-with-heterogeneous\\_fig1\\_332536922](https://www.researchgate.net/figure/a-Initial-doppler-ultrasound-showing-enlarged-left-epididymis-with-heterogeneous_fig1_332536922) [accessed 28 Mar 2026]

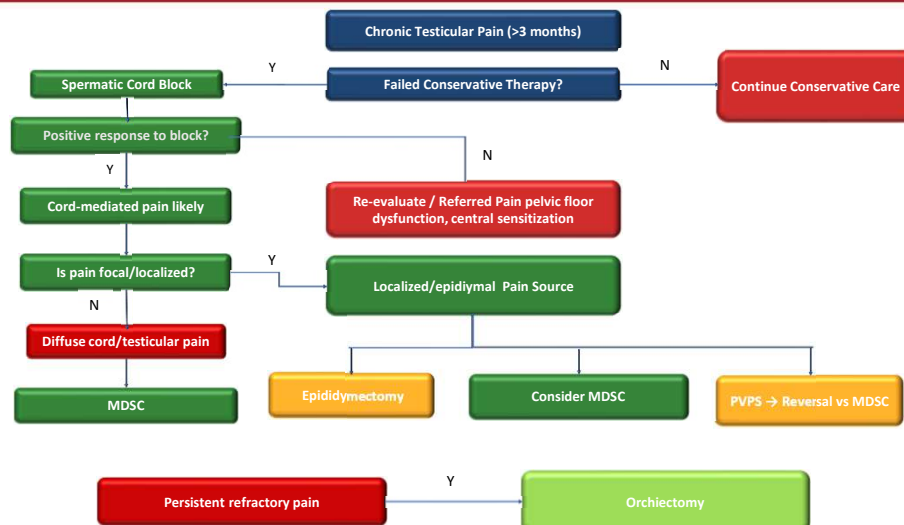
- Start empiric antibiotics
- STI: Ceftriaxone + doxycycline
- Enteric: Levofloxacin
- NSAIDs, scrotal support

- Reassess in 48–72 hours
- If no improvement: reconsider diagnosis
- Consider imaging

- Severe symptoms
- Immunocompromised
- Diagnostic uncertainty
- Failure of outpatient therapy

- **Chronic Pain Evaluation**
- History
  - >3 months
  - Multifactorial
- Psychosocial
- Imaging
- **Chronic Management**
- NSAIDs
- Neuropathic meds
- PT
- Blocks

- Microscopic Denervation Spermatic Cord (MDSC)
  - Recognized in chronic scrotal content pain (CSCP) literature
  - Considered a standard surgical option after failed conservative management
- Epididymectomy
- Orchiectomy



Condition	Onset	Key Features	Management
Torsion	Sudden	Severe pain, N/V, absent reflex	Immediate surgery
Epididymitis	Gradual	Dysuria, fever	Antibiotics
Appendage torsion	Subacute	Blue dot sign	Supportive
Varicocele	Chronic	Dull ache	Observe vs surgery
Hydrocele	Chronic	Painless swelling	Observe
Hernia	Variable	Groin + scrotal pain	Surgery

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2. Practice Committee of the American Society for Reproductive Medicine. Report on varicocele and infertility. *Fertil Steril*. 2014;102(6):1556-1560.
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