Acute Scrotum in Children: Testicular Torsion vs Epididymitis

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References: Nelson Textbook of Pediatrics, UpToDate

Definition

Acute scrotum is the **sudden onset of scrotal pain, swelling, and tenderness** requiring urgent evaluation.
The two most important causes are:

1. Testicular Torsion

Surgical emergency requiring immediate intervention

2. Epididymitis

Usually treated medically with antibiotics and supportive care

⚠ ⚠ Assume Testicular Torsion until proven otherwise. Do NOT delay surgical consultation while waiting for imaging if torsion is strongly suspected.

Pathophysiology (High Yield)

Testicular Torsion

- Twisting of the spermatic cord
- Decreased blood flow to the testis
- Ischemia
- Testicular necrosis if untreated

Epididymitis

- Inflammation or infection of the epididymis
- Pain and swelling develop
- Blood flow to the testis is **preserved**

Clinical Features: Torsion vs Epididymitis

Feature	Testicular Torsion	Epididymitis
Onset	Sudden	Gradual
Pain	Severe	Progressive
Nausea / Vomiting	Common	Uncommon
Fever	Usually absent initially	Common
Dysuria	Rare	Common
Cremasteric Reflex	Absent	Preserved
Testicular Position	High-riding, horizontal	Normal
Urinalysis	Usually normal	Pyuria may be present
Blood Flow on Doppler	Decreased	Increased

RED FLAGS for Testicular Torsion

The following findings require **immediate surgical evaluation**:

Sudden Onset Severe Unilateral Pain

Nausea and Vomiting

High-Riding Testis

Horizontal Lie

Absent Cremasteric Reflex

Severe Scrotal Swelling

Risk Factors

Testicular Torsion

Bell-Clapper Deformity

Anatomical predisposition allowing free rotation of the testis

Previous Intermittent Torsion

History of prior episodes increases risk

Adolescence

Peak incidence during puberty

Rapid Testicular Growth

Associated with pubertal development

Epididymitis

Urinary Tract Infection

Ascending bacterial infection from the urinary tract

Sexually Transmitted Infection

Chlamydia and gonorrhea in sexually active adolescents

Congenital Urinary Tract Anomalies

Structural abnormalities predisposing to infection

Diagnostic Approach — Step 1

History and Physical Examination

The first and most critical step in evaluating acute scrotum is a thorough history and physical examination. Assess the following key parameters:

Onset of Pain

Sudden vs. gradual onset is the most discriminating historical feature

Severity

Severe acute pain strongly suggests torsion

Vomiting

Presence of nausea and vomiting is a red flag for torsion

Dysuria

Urinary symptoms suggest epididymitis over torsion

Fever

Fever is more consistent with epididymitis or orchitis

Cremasteric Reflex & Testicular Position

Absent reflex and high-riding testis are hallmarks of torsion

Diagnostic Approach — Step 2

Is Torsion Suspected?

YES — Torsion Suspected

01

Immediate Pediatric Surgical / Urologic Consultation

Do not wait — call the surgical team immediately

02

Urgent Surgical Exploration

Proceed directly to the operating room

❌ Do NOT delay for imaging under any circumstances.

NO — Torsion Less Likely

Consider epididymitis. Perform the following investigations:

Urinalysis

Look for pyuria and bacteriuria

Urine Culture

Identify causative organism and guide antibiotic therapy

STI Testing

If indicated based on age and sexual history

Diagnostic Approach — Step 3

Color Doppler Ultrasound

Useful when the diagnosis is uncertain **and** imaging can be obtained immediately without delay.

Condition	Doppler Finding
Torsion	↓ Decreased or absent blood flow
Epididymitis	↑ Increased blood flow

"Time is Testis"

The chance of testicular salvage is **highest if surgery is performed within 6 hours** after symptom onset.
Delayed diagnosis increases the risk of **permanent testicular loss**.

90%

Salvage Rate

When detorsion occurs within 6 hours

50%

Salvage Rate

When detorsion occurs at 6–12 hours

10%

Salvage Rate

When detorsion occurs after 24 hours

Management: Testicular Torsion

Definitive Treatment

01

Immediate Surgical Exploration

Do not delay — proceed to OR urgently

02

Detorsion

Untwist the spermatic cord to restore blood flow

03

Bilateral Orchiopexy

Fix both testes to prevent future torsion

04

Orchiectomy if Nonviable

Remove the testis if it is not salvageable

Postoperative Care

Analgesics

Adequate pain management post-surgery

Scrotal Support

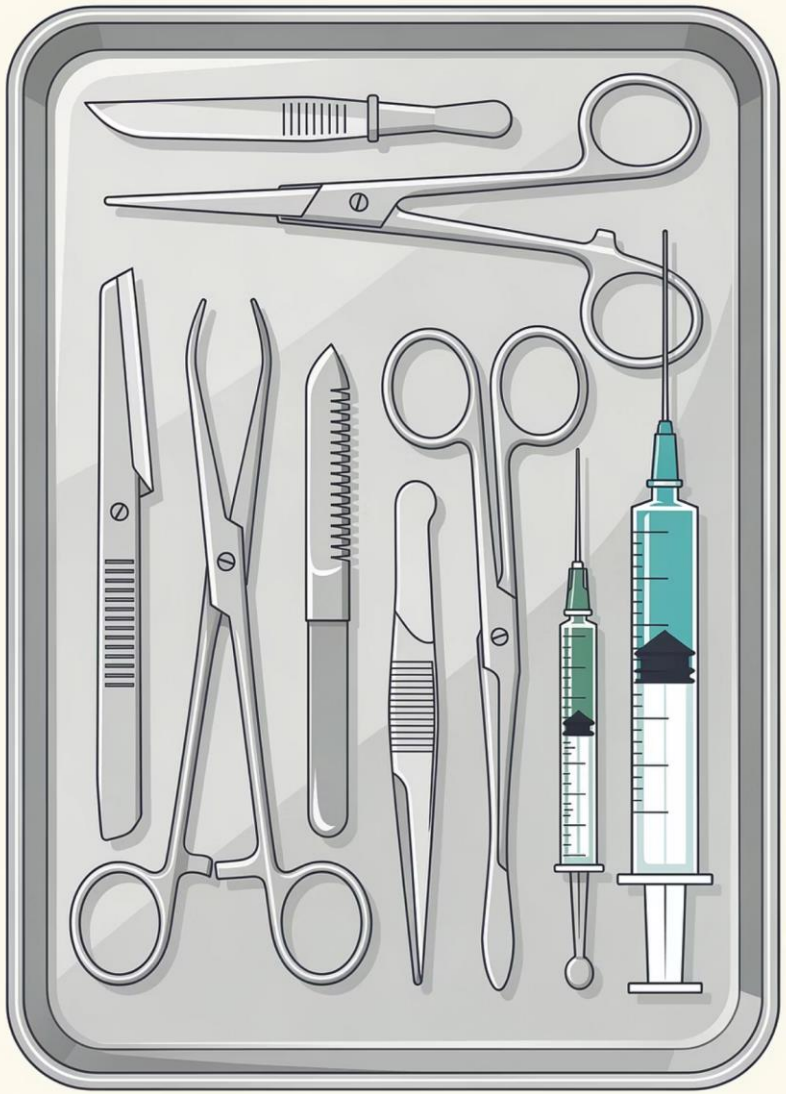
Reduce swelling and discomfort

Ice Packs

Apply to reduce local inflammation

Activity Restriction

Limit physical activity during recovery



Management: Epididymitis

Medical Treatment

Antibiotics

According to age and etiology — cover gram-negative organisms in prepubertal boys; cover STIs in sexually active adolescents

NSAIDs

For pain relief and reduction of inflammation

Scrotal Elevation and Support

Helps reduce swelling and discomfort

Rest

Limit physical activity until symptoms resolve

Follow-Up: Reassess If...

- → Persistent pain despite treatment
- → Increasing scrotal swelling
- → Persistent or worsening fever
- → Suspected abscess formation
- → Suspected orchitis (involvement of the testis)

Diagnostic Algorithm & Key Home Messages

The algorithm above guides clinical decision-making for every child presenting with acute scrotal pain.

Key Home Messages

🔑 Assume Torsion First

Every acute scrotum is testicular torsion until proven otherwise

🔑 Classic Torsion Signs

Sudden severe pain + absent cremasteric reflex = torsion until proven otherwise

🔑 Surgical Emergency

Torsion is a surgical emergency — do not delay surgery waiting for ultrasound when suspicion is high

🔑 Epididymitis Pattern

Gradual pain, fever, and urinary symptoms suggest epididymitis — treat medically

⏱ Time is Testis

Early diagnosis and prompt surgery saves the testicle — every minute counts