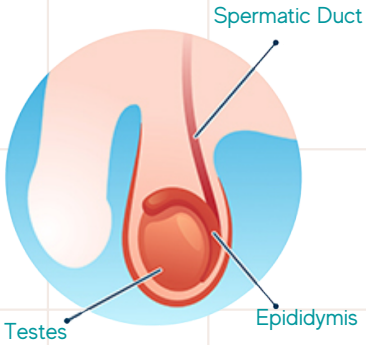
The ABCs of Testicular Torsion

Definition

Testicular torsion is a painful urologic emergency caused by **twisting of the spermatic cord** causing **compromise of the blood supply** to the affected testis.



Normal Anatomy


Testicular Torsion

Clinical Features

- Sudden onset severe pain initially in lower abdomen then localised to scrotum
- In children, may awaken with scrotal pain in middle of the night
- Swollen, tender, erythematous scrotum
- Tender mass "knot" superior to testis on palpation
- Asymmetrically high-riding testis with long axis oriented transversely

Associated Features

- Nausea and vomiting
- No Fever
- Loss of ipsilateral cremasteric reflex
- Relief of pain with detorsion away from midline

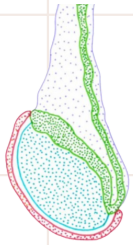
Aetiology

Anatomical defect

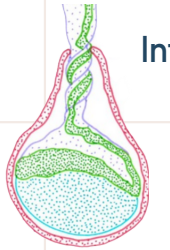
- Bell clapper deformity
  - Most common cause for intra-vaginal testicular torsion.
  - High investment of the tunica vaginalis (allowing spermatic cord to twist)
- Inversion of tests
  - Testis rotated; lies transversely or upside down
- Separation of epididymis from gubernaculum
  - Permits torsion of the testis on the pedicle that connects the testis with the epididymis.
  - More common among neonates

Trauma

- Inciting event is usually unknown
- Trauma may be the cause in a minority of cases (4-8%)


Normal Testes


Bell Clapper Anomaly


Intravaginal Torsion

Pathophysiology

- Underlying anatomical defect/trauma
- Cremasteric contraction
  - Following mechanical, sexual, or thermic stimulation
  - Often precipitated by straining on stool, sexual activity, or sports.
- Testis rotated around vertical axis 90-180°
  - Spiral attachment of cremaster favours vertical axis rotation of the testis
- Reduced arterial inflow and obstructed venous outflow
  - Venous blood flow cut off leading to venous congestion and ischemia
  - Arterial supply cut off worsens ischemia leading to necrosis.

Risk Factors

- 10-25 years of age
- Previous testicular torsion
- Vigorous physical activity or trauma hours before onset

Differential Diagnosis

	Symptom onset	Pain location	Cremasteric reflex	Other clinical findings
Appendiceal torsion	Acute or subacute	Upper pole of testis	Positive	Blue dot sign
Epididymitis	Acute or chronic	Epididymis	Positive	Positive urinalysis, urine culture, or diagnostic tests for gonorrhoea or Chlamydia infection
Fournier's gangrene	Acute	Diffuse	Positive	Tense oedema outside of involved skin, blisters/bullae, crepitus, fever, rigours, hypotension
Testicular torsion	Acute	Testis	Negative	High-riding testis, bell clapper deformity, profound testicular swelling

Evaluation

1.Testicular Workup for Ischemia and Suspected Torsion (TWIST) score

- Is a clinical decision tool used for the workup and management of acute scrotal emergencies where torsion is suspected
- Uses history and examination to estimate the likelihood of torsion.

Criteria

Testicular Swelling	2 points
Hard Testis	2 points
Absent Cremasteric Reflex	1 point
Nausea or Vomiting	1 point
High Riding Testis	1 point

- Interpretation
  - score 0-2: low risk
    - 100% negative predictive value for torsion
    - Ultrasound/Urological consultation nor generally required
  - score 3-4: intermediate risk
    - ultrasound warranted
  - score 5 or above: high risk
    - 100% positive predictive value for torsion
    - ultrasound not required, urgent urological consultation and surgery required to salvage testis

2.Colour Doppler Ultrasonography

- First-line First-line imaging modality
- Evaluation of the spermatic cord up to the level of the internal ring
- Useful when a low suspicion of testicular torsion exists
- Ultrasonographic findings suggestive of acute testicular torsion:
  - Absent or decreased blood flow in the affected testicle
  - Decreased flow velocity in the intratesticular arteries
  - Increased resistive indices in the intratesticular arteries
  - Hypervascularity with a low resistance flow pattern (after partial torsion-detorsion)
- Whirlpool Sign

3.Surgical Exploration

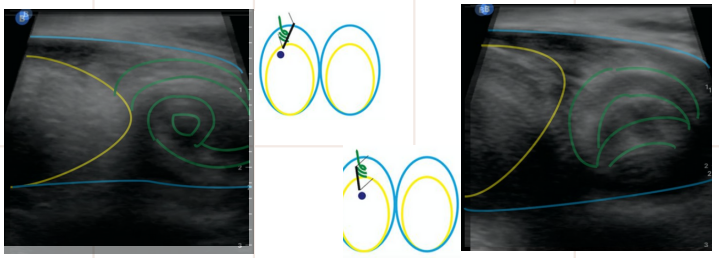


Diagram shows tunica vaginalis (blue), testis (yellow) and spermatic cord (green). The spermatic cord might rotate inward about two turns.

Complications

Infarction of testicle/permanent testicular damage/loss of testicles

- Short term; High likelihood
- No. of rotations and duration of ischaemia determine degree of tissue viability
- Treatment within 4-6 hours of symptom onset high likelihood of viability
- Testis remain twisted for >10-12 hours; irreversible schema and damage likely
- >12 hours necrosis most likely occurred

Infertility secondary to loss of testicle

- long term; High likelihood
- Spermatogenesis significantly impaired in most patients

Psychological Implications

- Variable timeframe; High likelihood

Cosmetic Deformity

- Variable timeframe; High likelihood

Recurrent Torsion

- Variable timeframe; Medium likelihood
- may develop years later, regardless of type of sutures used

Impaired Pubertal Development

- Variable timeframe; Low likelihood

Treatment

- For suspected testicular torsion urgent surgical exploration with intraoperative detorsion and fixation of the testes is needed
- Delay in detorsion → progressively higher rates of testicular nonviability
  - Window of opportunity: salvage within 6 hours of onset of pain
- Manual detorsion performed if surgical intervention not immediately available
  - 180° medial to lateral then evaluate pain relief. If pain worsens, consider rotating in opposite direction.

Surgery

- Detorsion and fixation of both involved testis and the contralateral uninvolved testis should be performed
  - inadequate gubernacular fixation usually a bilateral defect
- Exploration for torsion performed through transverse scrotal incision.
- If the testis viable when cord is untwisted prevented retwisting by fixating with 3 non-absorbable sutures between the tunica albuginea and the scrotal raphe
  - Use of absorbable sutures risks the possibility of recurrent torsion
- Testis infarcted with necrosis require orchiectomy
  - If clinical doubt of testicular viability after detorsion, wrap in a warm swab and observe over a few minutes.
  - Small incision in tunica albuginea demonstrating bright red arterial bleeding indicates testicular survival
  - Infarcted testis removed – the counsel on prosthetic replacement.