

Twist and Shout: Acute Scrotal Pain and Masses Demystified

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Disclosure

I have no financial interests or relationships to disclose.



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Learning Objectives:

- A. Understand that **age** is a key determinant in the differential diagnosis
- B. Recognize the “can’t miss” diagnosis: testicular torsion
(*and the non-acute presentation - testicular cancer*)
- C. Ultrasound is your friend in cases of scrotal pathology
- D. There is overlap in signs and symptoms of Testicular torsion, torsion of appendix and epididymitis – when in doubt, contact Urology

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Acute Scrotal Pain and Masses

Acute, painful

- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- Scrotal Abscess/Fournier’s

Acute scrotal trauma

Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- Varicocele
- Spermatocoele

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The Acute Scrotum



Estimate: 0.5% of all ED visits

Acute, painful

- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- Scrotal Abscess/Fournier's

Acute scrotal trauma

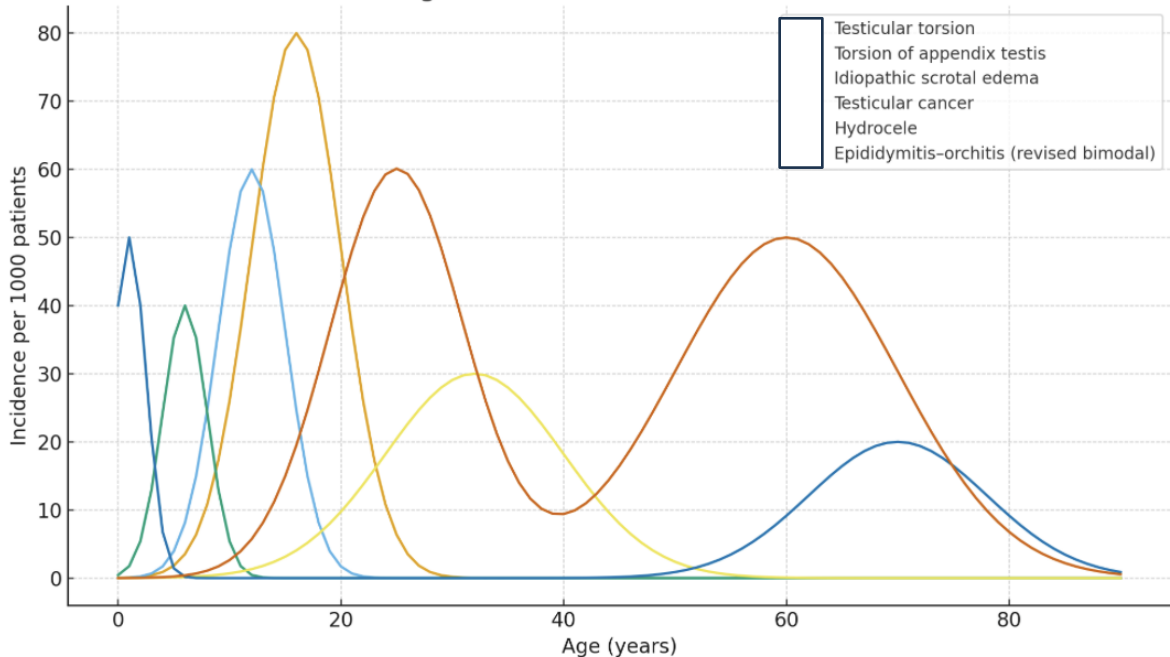


First and most important question...

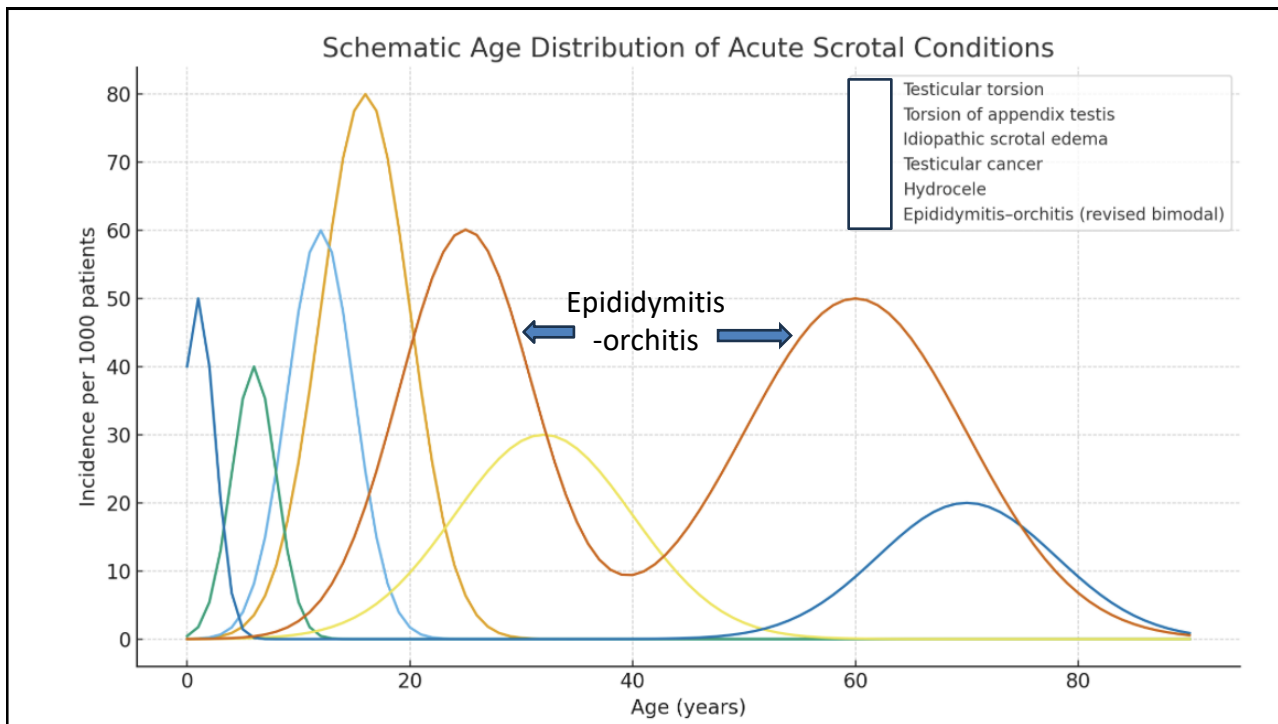
What is the age of the patient??

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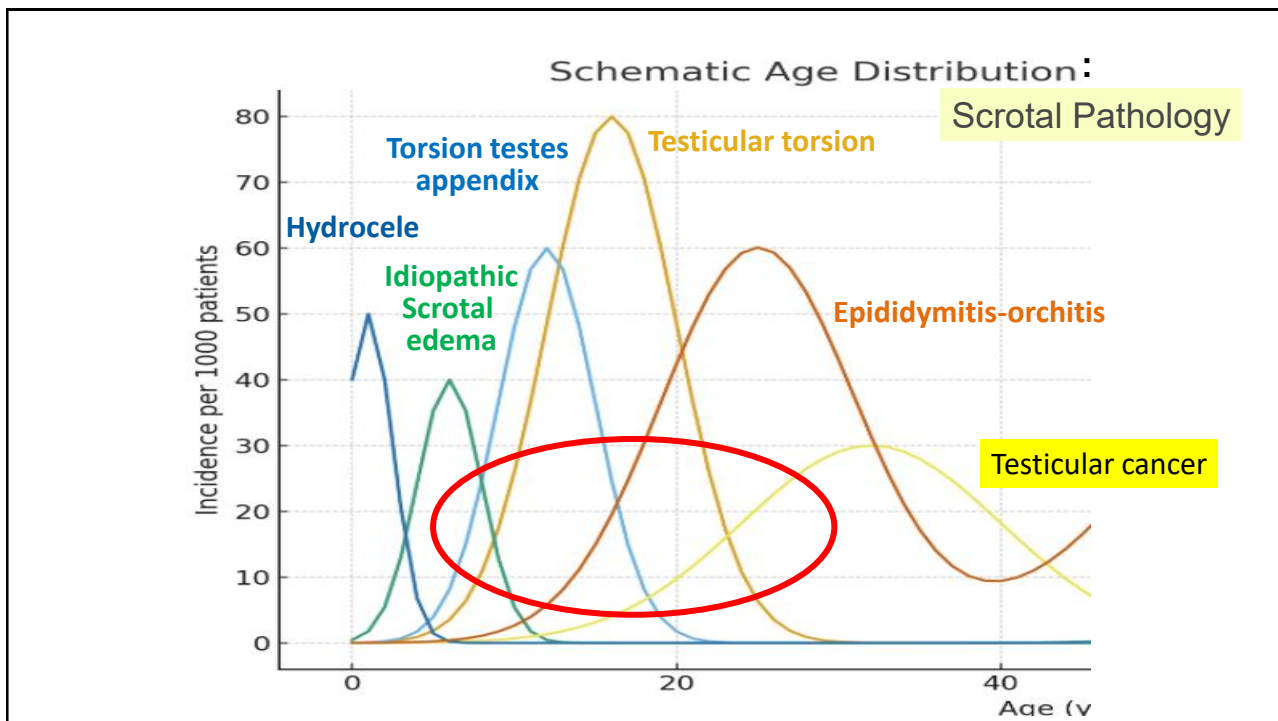
Schematic Age Distribution of Acute Scrotal Conditions



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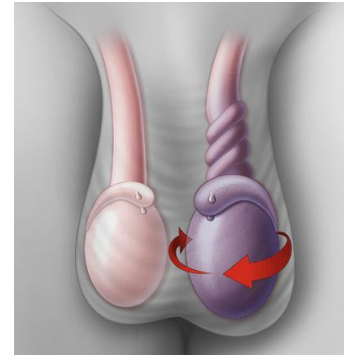


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Testicular Torsion



- 180 – 720 degree “twist” of spermatic cord
- Median (at orchiopexy 360°)
- Lifetime risk: 1 in 889¹
- 3.2% of children arriving in ED with acute scrotal pain²



¹Shteynshlyuger, A, et al. J Ped Urology 2013

²Core EM

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Testicular Torsion

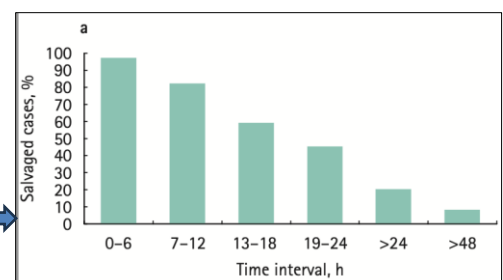


- 180 – 720 degree “twist” of spermatic cord
- Median (at orchiopexy 360°)
- Lifetime risk: 1 in 889¹
- 3.2% of children arriving in ED with acute scrotal pain²

- **“Time Sensitive Diagnosis”**
- *testicular loss: 45% to 82%*¹
- **“Can’t Miss Diagnosis”**



6-hour rule

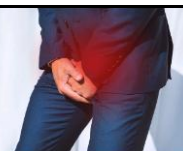


¹Reddy k, et al. Cureus 2023 Jul 31;15(7):e42754

Based on data from Mellick LB, et al. Ped Emerg Care 2019

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Testicular Torsion: The “Can’t Miss” Diagnosis



WHY???

- Decreased fertility
- Sexual dysfunction
- Psychological effect

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Testicular Torsion: The “Can’t Miss” Diagnosis



- ~~Decreased fertility~~
- ~~Sexual dysfunction~~
- Psychological effect

Paternity rates^{1,2}

84-91% in orchiectomy
82-92% in population

FSH, LH, testosterone: normal

¹Effect of unilateral testicular torsion at different ages on male fertility. Zhang X, et al J Int Med Res 48(4) 1–8 2020

²Pregnancy rates after Testicular Torsion. Gielchinsky I, et al. J of Urol 2016

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Testicular Torsion: The “Can’t Miss” Diagnosis



- ~~Decreased fertility~~
- ~~Sexual dysfunction~~
- Psychological effect

Paternity rates^{1,2}

84-91% in orchiectomy
82-92% in population

FSH, LH, testosterone: normal



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Testicular Torsion: Presentation

- Sudden onset, unilateral sharp pain – universal (85-90%¹)
- Onset time – variable. Significant amount during sleep
 - *Cold weather association?*
- Prior Intermittent symptoms – 30-50%
 - minutes – 2-3 hours, spontaneous resolution

¹Lacy A, et al. Am J Emerg Med; 2023; 66: 98–104

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Testicular Torsion: The “Can’t Miss” Diagnosis



- ~~Decreased fertility~~
- ~~Sexual dysfunction~~
- Psychological effect

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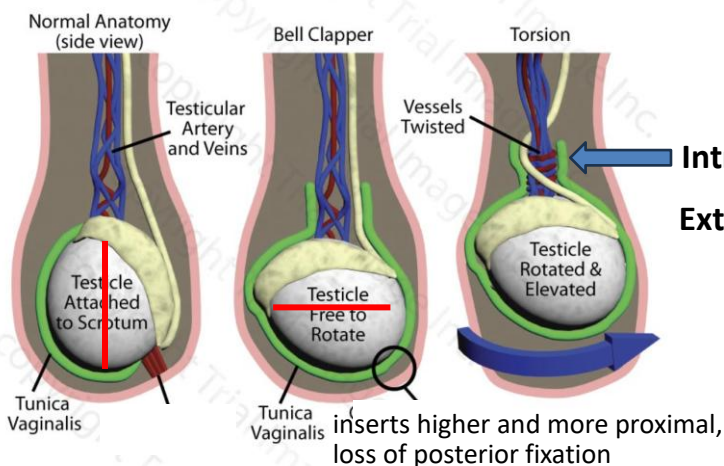


Missed Testicular Torsion Diagnosis Leads to \$8.5 Million Award Oct 26, 2011

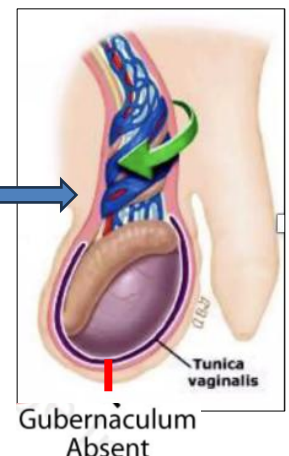
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Testicular Torsion: Why Does This Happen? Part 1: Congenital Predisposition

Bell-Clapper Deformity and Testicular Torsion



Neonate



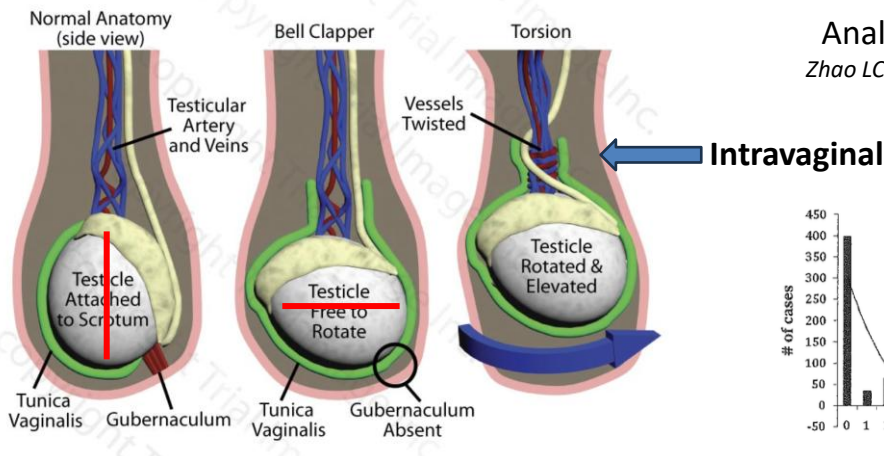
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Testicular Torsion: Why Does This Happen?

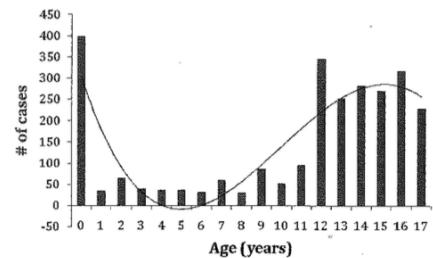
Part 1: Congenital Predisposition

Part 2: Hormones of Puberty

Bell-Clapper Deformity and Testicular Torsion



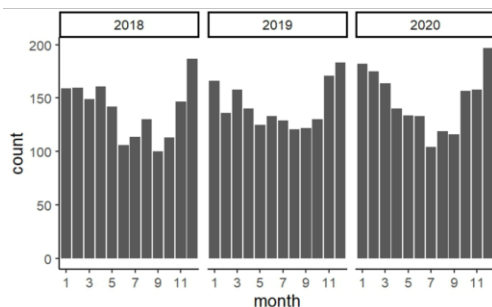
Analysis of 2,243 US cases
Zhao LC et al. J Urol 2011; 186:2009-13



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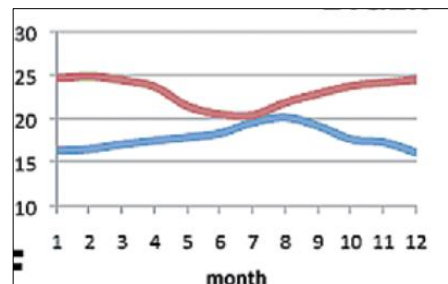
Testicular Torsion: Presentation

- Sudden onset, unilateral sharp pain – universal (85-90%¹)
- Onset time – variable. Significant amount during sleep, 5-10% (+) trauma
- Cold weather association?



Analysis 5,111 cases testicular torsion in Japan
Hiramatsu, A, et al, PLOS One; published 3/8/2024

Temp C°



Analysis 21, 189 cases TT in Brazil
Korkes F, et al. Int Braz J Urol. 2012; 38: 222-9

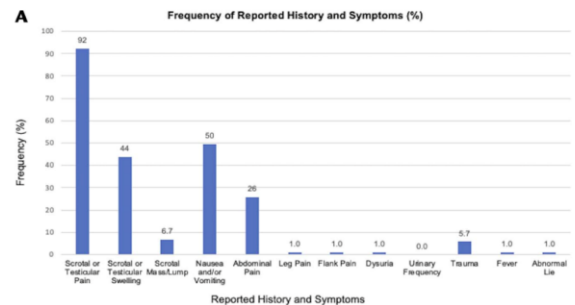
¹Lacy A, et al. Am J Emerg Med; 2023; 66: 98–104

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Testicular Torsion: Presentation

- Sudden onset, unilateral sharp pain – universal (85-90%)¹
- Onset time – variable. Significant amount during sleep
 - *Cold weather association?*
- Prior Intermittent symptoms – 30-50%
 - minutes – 2-3 hours, spontaneous resolution
- **Associated symptoms:**
 - **Nausea/vomiting: approx. 50%**
 - **Abdominal pain: approx. 25%**

Delay in presentation younger > older

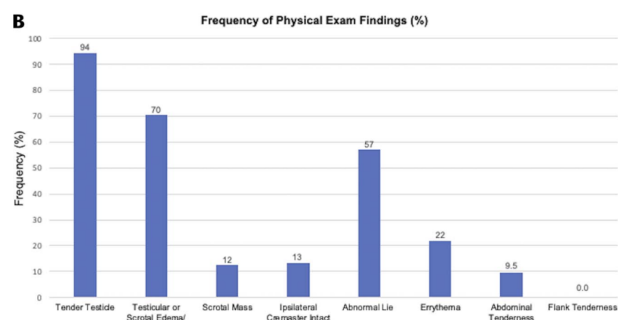


Moran JW, et al. *Ped Emerg Care* 2024; 60: 255-60

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Testicular Torsion: Exam

- Tender testicle
- Scrotal swelling
- High riding testicle
OR: 58.8¹
- Erythema



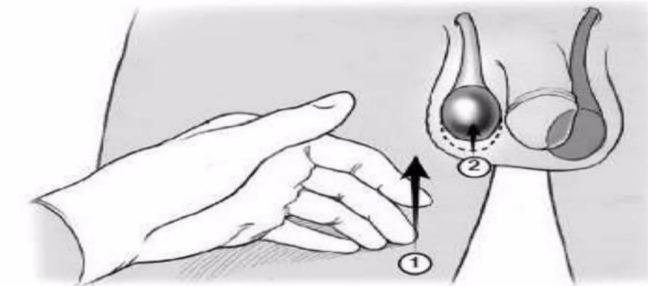
¹Ben-Israel T, et al. *Am J Emerg Med* 2010

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Testicular Torsion: Signs

- Cremasteric reflex: **absent in 70-100% with TT**^{1,2}

**Also absent in 30% of males with normal testicles*



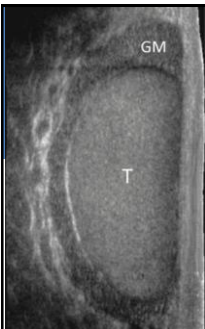
The reflex is elicited by (1) stroking the ipsilateral inner thigh with tongue depressor or gloved hand, resulting in (2) the elevation of testicle through contraction of the cremasteric muscle.

¹Mellick L. Pediatr Emer Care 2012; 28: 80-86

²Edwards, LG. et al. Emerg Med J 2025;42:474-475.

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Testicular Torsion: Diagnosis/Ultrasound Excellent... but Not Perfect



Normal
Radiology KEY

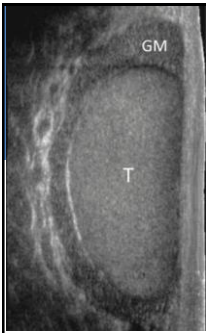
- Sensitivity: approx **70**-100% (rule out)
- Specificity: approx 95-99%

Pitfall: Read the body of the report!

Impression: “Findings favored to represent epididymo-orchitis. No sonographic evidence of testicular torsion.”

Findings: “Right testis mildly enlarged with heterogeneous echotexture. Color Doppler demonstrates decreased but present arterial flow compared with the left. Epididymal head enlarged and heterogeneous. Small reactive hydrocele.”

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Normal
Radiology KEY

Testicular Torsion: Diagnosis/Ultrasound Excellent... but Not Perfect

- Sensitivity: approx **70**-100% (rule out)
- Specificity: approx 95–99%

Pitfall: Read the body of the report!

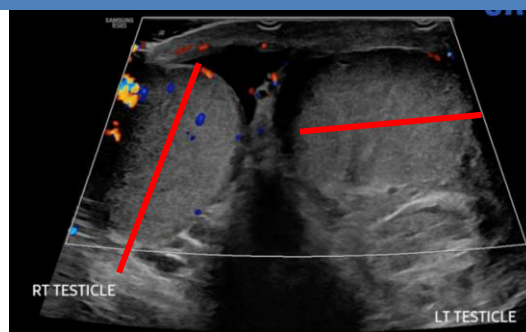
2. Impression: “No definite evidence of testicular torsion. Consider clinical correlation for epididymitis.”

Findings: “Spermatic cord on the right appears thickened with focal spiral configuration near the external inguinal ring. Intratesticular arterial flow present but subjectively decreased. Evaluation limited by patient discomfort.”

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Testicular Torsion: Diagnosis/Ultrasound Look in the Report....

A. Orientation and size



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Testicular Torsion: Diagnosis/Ultrasound

Look in the Report....

A. Orientation and size

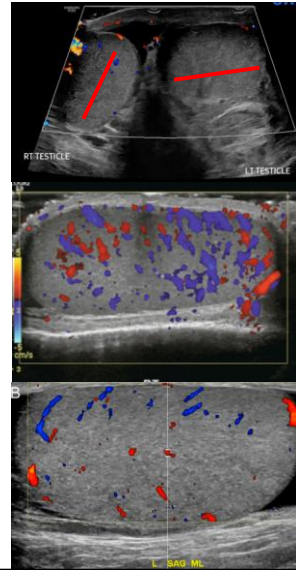
B. Color flow Doppler: Sensitivity 70-100%

Flow may be preserved (false +) in:
Early, **partial** or intermittent torsion

Partial < 360° twist



Gupta A, et al. J Ultrasound Med 2022;41:271–283



RadiologyKEY

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Testicular Torsion: Diagnosis/Ultrasound

Look in the Report....

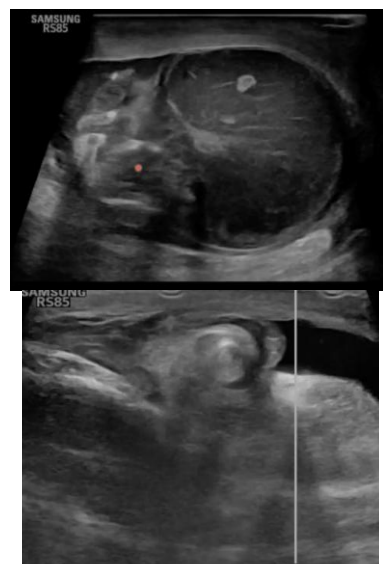
A. Orientation and size

B. Color flow Doppler

Sensitivity to R/O torsion: 70-100%

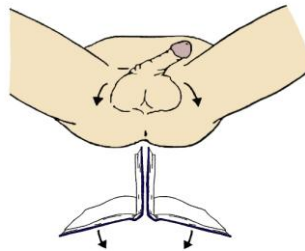
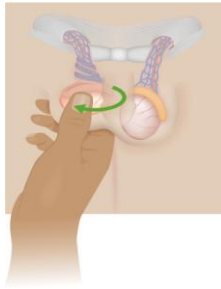
C. Redundant spermatic cord

“torsion knot” or “whirlpool sign”



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Testicular Torsion: Management → Detorsion



- 5- 6 rotations (360 – 1080°) Mean 555°
- 33-48% have lateral torsion^{1,2}
- Success rate: 26-95%³

¹Yecies T, et al. UROLOGY 2018; 114: 163–166

²Sessions AE. J Urol 2003; 169: 663-5.

³Qi X, et al. Front. Pediatr. 2024; 12:1362104.

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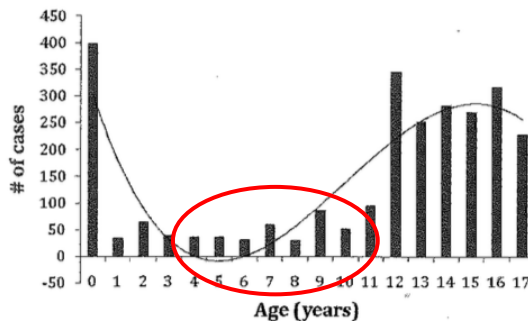
Do I Have to Get an Ultrasound?

03/25/2026 07:00	02y F		HD	LC	Dx: Constipation
03/25/2026 09:16	11y M		HD	NF	Dx: Testicular to...
03/25/2026 09:38	14y M		HD	LC	Dx: Testicular tor...

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Testicular Torsion: Pitfalls

- Not reading Ultrasound report (body)
- Younger age, atypical presentations: **Abdominal pain, vomiting**



Zhao LC, et al J of Urol., 2011. <https://doi.org/10.1016/j.juro.2011.07.024>

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Testicular Torsion: Pitfalls

- Not reading Ultrasound report (body)
- Younger age, atypical presentations: **Abdominal pain, vomiting**
- **Intermittent torsion**

50 cases: mean age: 12

- Mean # of episodes before surgery: 4.3
- Brief (seconds- minutes), sharp episodes, rapid resolution
- Nausea/vomiting: 25%
- **Horizontal lie of testicle (approx. 50%)**

INTERMITTENT TESTICULAR TORSION: DIAGNOSTIC FEATURES AND MANAGEMENT OUTCOMES

SAMUEL H. EATON, MARC A. CENDRON,* CARLOS R. ESTRADA, STUART B. BAUER,
JOSEPH G. BORER, BARTLEY G. CILENTO, DAVID A. DIAMOND, ALAN B. RETIK
AND CRAIG A. PETERS

From the Department of Urology, Children's Hospital Boston, Boston, Massachusetts

J Urol 2005; 174:1532-35

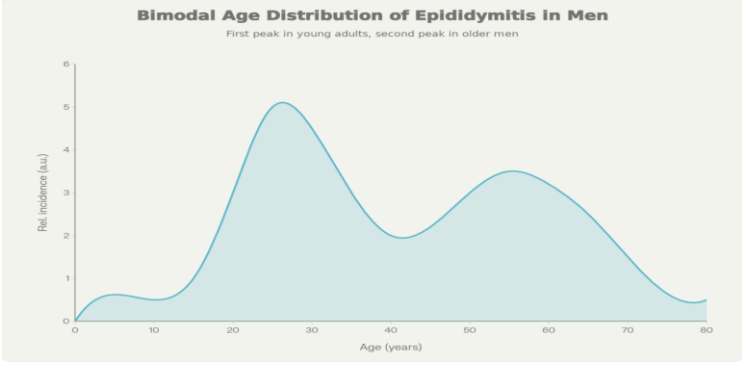
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Acute Scrotum: Testicular Torsion OR Epididymitis??



	Age
Torsion	10-18 yrs
Epi-Orchitis	Sex activity older



Bimodal Age Distribution of Epididymitis in Men
First peak in young adults, second peak in older men

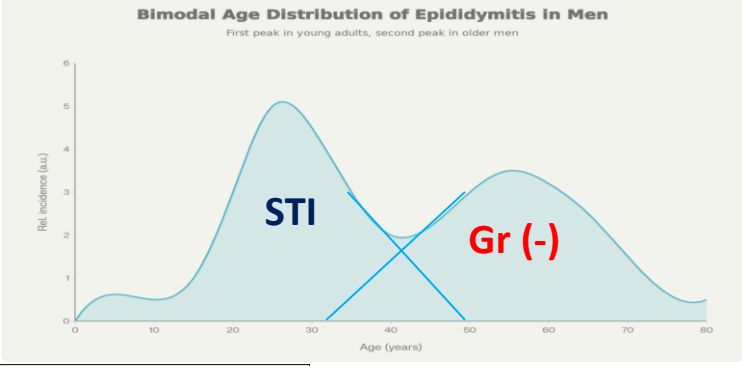
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Acute Scrotum: Testicular Torsion OR Epididymitis??



	Age
Torsion	10-18 yrs
Epi-Orchitis	Sex activity older



Bimodal Age Distribution of Epididymitis in Men
First peak in young adults, second peak in older men

- 1) Ceftriaxone + Doxycycline x 10 days
- 2) *If anal insertive-*
Ceftriaxone + levofloxacin x10 days

**Levofloxacin 500mg
x 10 days**

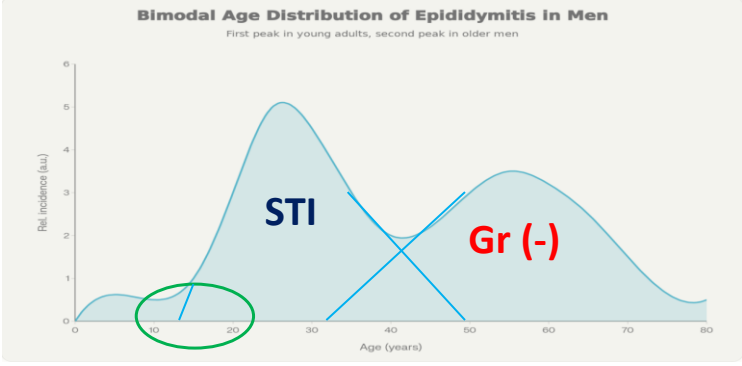
32



Acute Scrotum: Testicular Torsion OR Epididymitis??



	Age
Torsion	10-18 yrs
Epi-Orchitis	Sex activity older



Bimodal Age Distribution of Epididymitis in Men
First peak in young adults, second peak in older men

18yo, 24 hrs of gradual worsening pain, + swelling

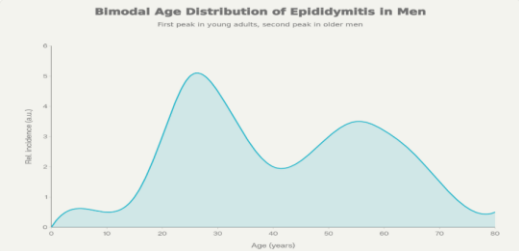
33



Acute Scrotum: Testicular Torsion OR Epididymitis??



	Age	Pain
Torsion	10-18 yrs	Sudden
Epi-Orchitis	Sex activity older	Gradual



Bimodal Age Distribution of Epididymitis in Men
First peak in young adults, second peak in older men

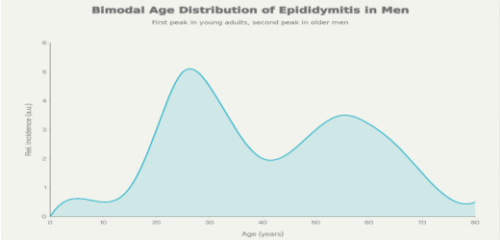
34



Acute Scrotum: Testicular Torsion OR Epididymitis??



	Age	Pain	Previous episodes	N/V/ Abd pain		
Torsion	10-18 yrs	Sudden	possible	possible		
Epi-Orchitis	Sex activity older	Gradual	absent	absent		



Bimodal Age Distribution of Epididymitis in Men
First peak in young adults, second peak in older men

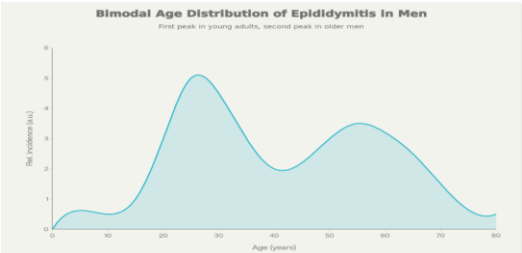
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Acute Scrotum: Testicular Torsion OR Epididymitis??



	Age	Pain	Previous episodes	N/V/ Abd pain	Cremasteric Reflex	Pyuria
Torsion	10-18 yrs	Sudden	possible	possible	absent	absent
Epi-Orchitis	Sex activity older	Gradual	absent	absent	(+) 75%	25-58%*



Bimodal Age Distribution of Epididymitis in Men
First peak in young adults, second peak in older men

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Acute Scrotum: Testicular Torsion OR Epididymitis??



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Torsion	10-18 yrs	Sudden	possible	possible	absent	absent
Epi-Orchitis	Sex activity older	Gradual	absent	absent	(+) 75%	25-58%*

18yo, 24 hrs of gradual worsening pain, + swelling
No N/V. Cremasteric reflex present

Do I have to transfer for US tonight?

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Testicular Torsion vs Epididymitis Do I Have to Send Everyone to the ER for US?

Answer: TWIST score

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Testicular Torsion vs epididymitis

Do I Have to Send Everyone to the ER for US?

Answer: **TWIST score**

Table 2. TWIST score distribution and incidence of TT

Study	Score													
	0		1		2		3		4		5		6	
	TT	No TT	TT	No TT	TT	No TT	TT	No TT	TT	No TT	TT	No TT	TT	No TT
Barbosa et al. 2013 (prospective phase) ^a	0	95	0	50	0	89	3	40	9	13	17	0	9	0
Frohlich et al. 2017 ²³	1	72	1	37	3	67	2	36	3	20	3	4	2	3
Jabbar et al. 2018 ²⁴	0	0	0	0	0	8	0	5	0	16	2	6	8	0
Pan, 2020 ²⁵	0	0	0	11	0	10	6	5	7	2	15	0	18	0
Lim et al. 2020 ²³	1	115	1	12	8	110	6	12	11	15	7	7	8	1
Totals (%)	2	282	2	110	11	284	17	98	30	66	44	17	43	4
% Pts with score		26.8		10.6		27.8		10.8		9.1		5.8	4.4	4.7

Prospective, pediatric studies with physician examiners only (5 studies, 1,080 patients, 199 torsions).
* Authors were contacted for raw data.

Sensitivity for low-risk (0-2) group was 97.8% (15/676)

Qin KR, et al. J Urol 2022; 208: 62-70

Testicular Workup for Ischemia and Suspected Torsion (TWIST)

Diagnoses testicular torsion, decreasing indication for ultrasound.

When to Use ▾

Testicular swelling	No	0	Yes	+2
Hard testicle	No	0	Yes	+2
Absent cremasteric reflex	No	0	Yes	+1
Nausea/vomiting	No	0	Yes	+1
High riding testis	No	0	Yes	+1

2 points
TWIST Score

Low risk
Risk of testicular torsion
No recommendation for ultrasound.

Copy Results Next Steps

mdcalc.com

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ARS Question #2

A 25-year-old presents with 24 hours of progressively worsening right scrotal pain. No recent trauma. No nausea, vomiting, or fever. Denies dysuria, hematuria or discharge. Exam: Appears comfortable. Scrotum: swollen, soft, tender testicle. Testicle not high riding. The cremasteric reflex is present bilaterally. Urinalysis is normal.

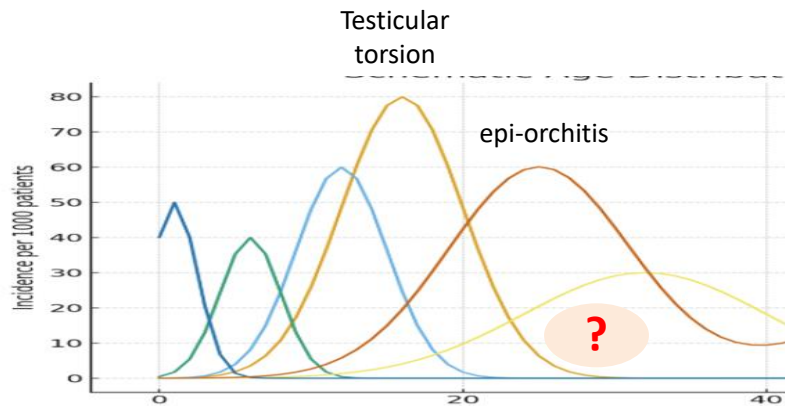
Which Clinical Decision Instrument Has Been Prospectively Evaluated to Risk Stratify Testicular Torsion as “Low Risk” in This Case?

- TWIST score
- Cremasteric plus score
- BAL scoring system
- AI score

Testicular Torsion vs Epididymitis

Do I Have to Send Everyone to the ER for US?

***However... make arrangement for Ultrasound**

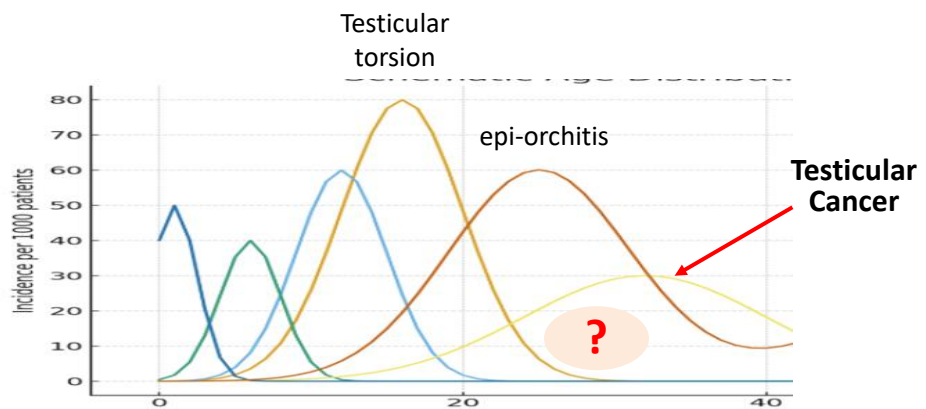


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Testicular Torsion vs Epididymitis

Do I Have to Send Everyone to the ER for US?

***However... make arrangement for Ultrasound**

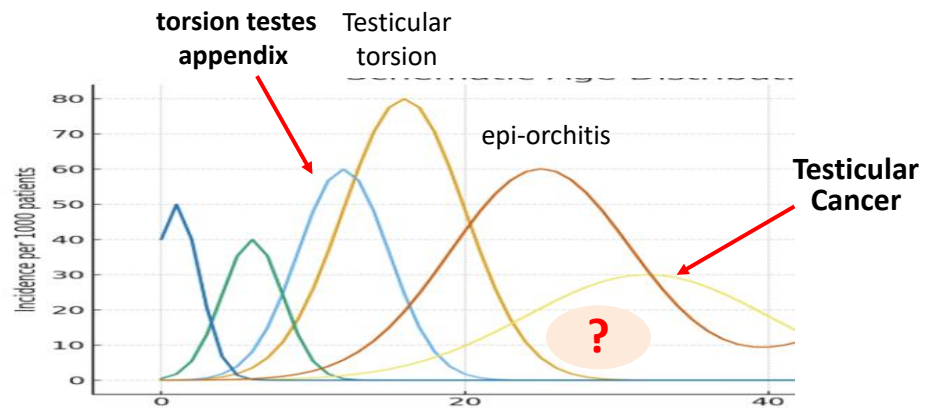


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Testicular Torsion vs Epididymitis

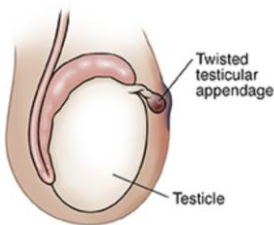
Do I Have to Send Everyone to the ER for US?

***However... make arrangement for Ultrasound**



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Torsion Testes Appendix



- Remnant of mullerian duct – 85% present (25% also have epididymal appendix)
- Enlarge in pre-pubertal phase (**ages 7-12**)
- **Well appearing child, localized scrotal pain and tenderness of upper pole**

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ARS Question #1

A 9-year-old boy presents with sudden onset left scrotal pain that started 12 hours ago. No nausea, vomiting, or fever.

Exam: child appears comfortable (on iPad). On exam, (+) significant tenderness on palpation of the upper pole of the left testicle. No significant swelling, erythema, or scrotal discoloration. The cremasteric reflex is present bilaterally. Urinalysis is normal.

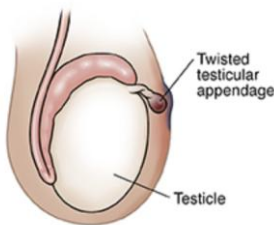
Which of the Following Is the Most Likely Diagnosis?

- A. Testicular torsion
- B. Epididymitis
- C. Torsion of the testicular appendix
- D. Inguinal hernia



CONTINUING EDUCATION COMPANY

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Torsion Testes Appendix

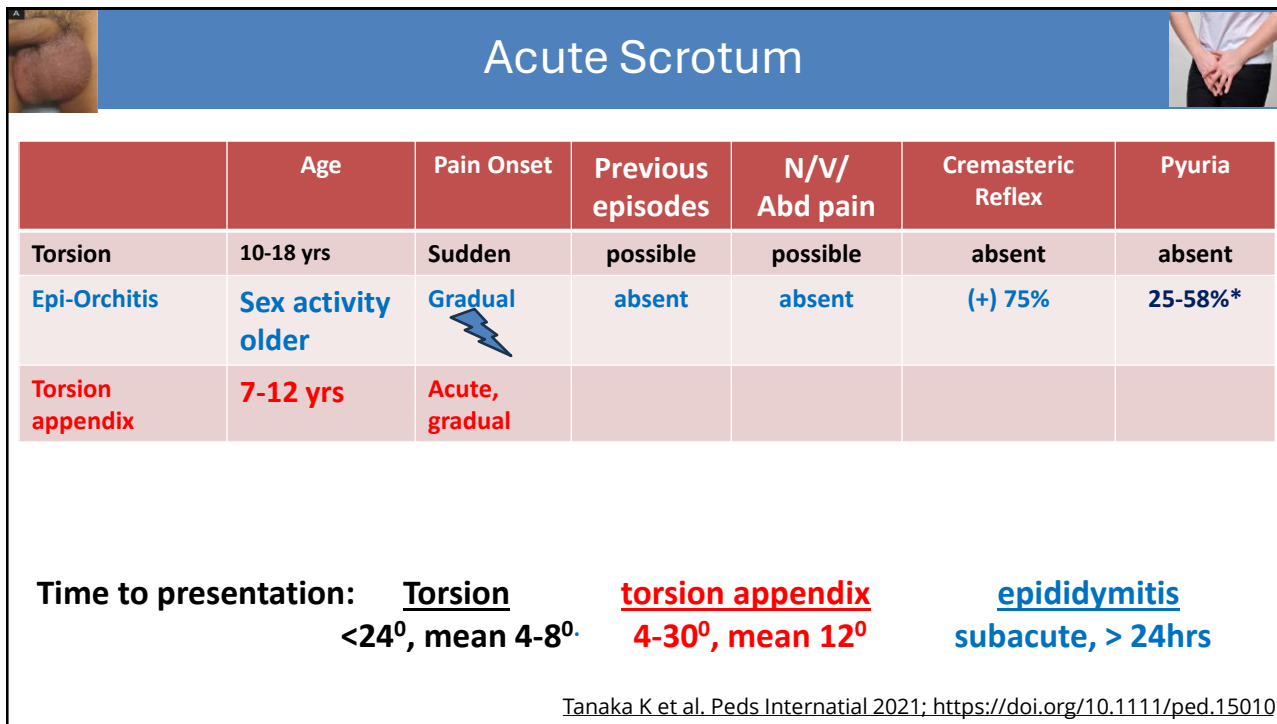
- Remnant of mullerian duct – 85% present (25% also have epididymal appendix)
- Enlarge in pre-pubertal phase (ages 8-11)
- **Well appearing child, localized scrotal pain and tenderness of upper pole**



- **Blue dot sign:**
0-26% cases



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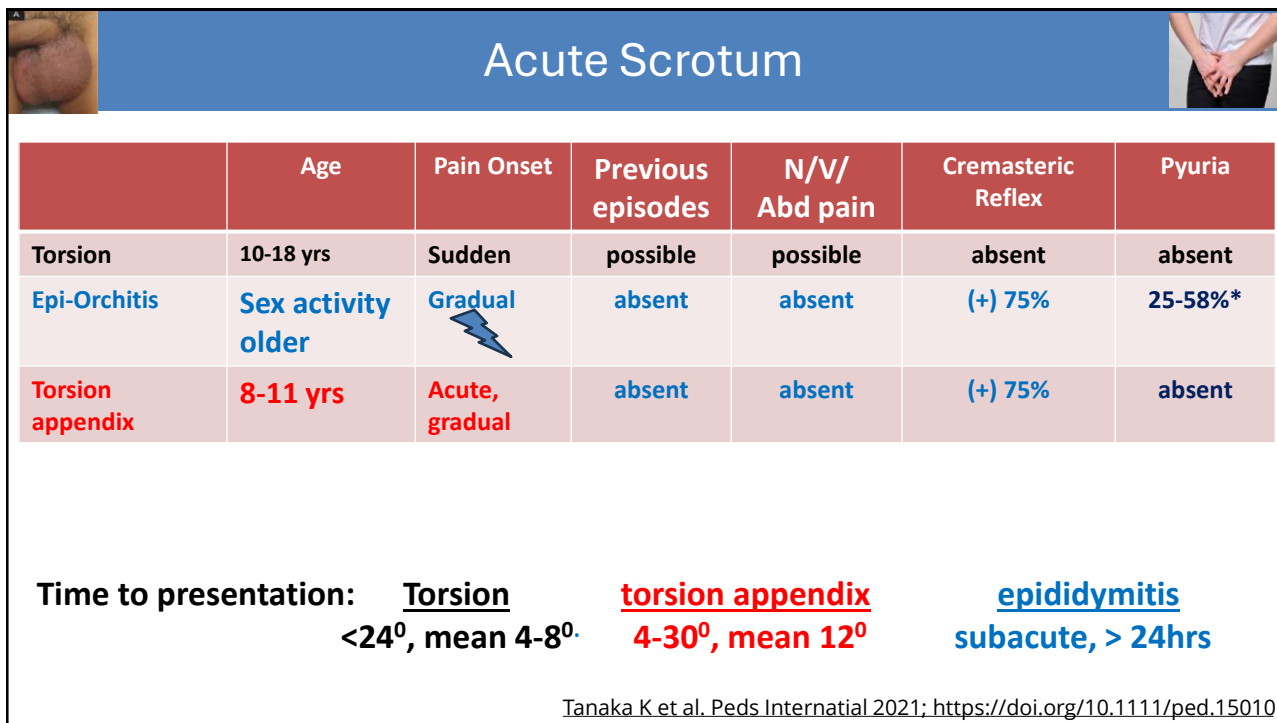
Acute Scrotum

	Age	Pain Onset	Previous episodes	N/V/ Abd pain	Cremasteric Reflex	Pyuria
Torsion	10-18 yrs	Sudden	possible	possible	absent	absent
Epi-Orchitis	Sex activity older	Gradual	absent	absent	(+) 75%	25-58%*
Torsion appendix	7-12 yrs	Acute, gradual				

Time to presentation: Torsion <24⁰, mean 4-8⁰. torsion appendix 4-30⁰, mean 12⁰ epididymitis subacute, > 24hrs

Tanaka K et al. Peds Internatinal 2021; <https://doi.org/10.1111/ped.15010>

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Acute Scrotum

	Age	Pain Onset	Previous episodes	N/V/ Abd pain	Cremasteric Reflex	Pyuria
Torsion	10-18 yrs	Sudden	possible	possible	absent	absent
Epi-Orchitis	Sex activity older	Gradual	absent	absent	(+) 75%	25-58%*
Torsion appendix	8-11 yrs	Acute, gradual	absent	absent	(+) 75%	absent

Time to presentation: Torsion <24⁰, mean 4-8⁰. torsion appendix 4-30⁰, mean 12⁰ epididymitis subacute, > 24hrs

Tanaka K et al. Peds Internatinal 2021; <https://doi.org/10.1111/ped.15010>

48

Torsion Tests Appendix: Evaluation and Management



- **TWIST score/ Ultrasound**
- **Conservative care**

Testicular Workup for Ischemia and Suspected Torsion (TWIST)

Diagnoses testicular torsion, decreasing indication for ultrasound

What is the w	No	Yes	+
Testicular swelling	No	Yes	+2
Hard testicle	No	Yes	+2
Absent cremasteric reflex	No	Yes	+1
Nausea/vomiting	No	Yes	+1
High riding testis	No	Yes	+1

2 points
TWIST Score

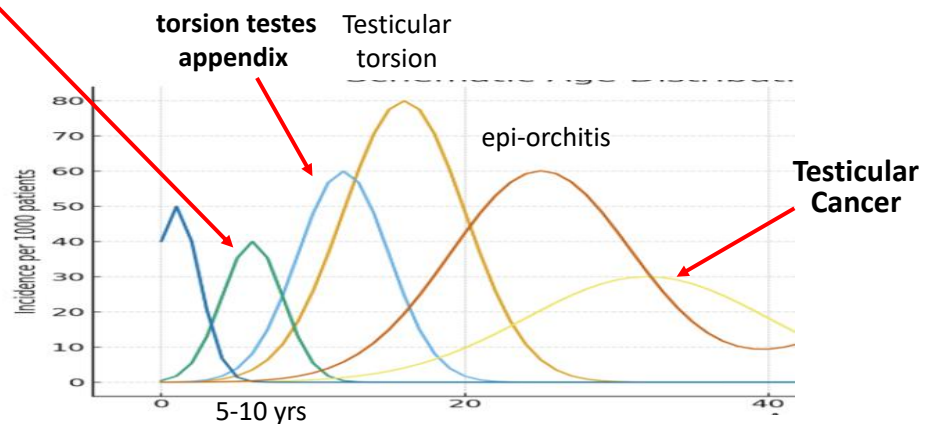
Low risk
Risk of testicular torsion
No recommendation for ultrasound.

[Copy Results](#) [Next Steps](#)



49

Idiopathic Scrotal Edema

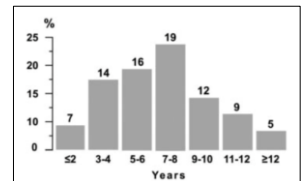


50



Idiopathic Scrotal Edema

- Up to 10% of acute scrotum in children (?)
- 1/3 hemiscrotum, 2/3 bilateral – may extend (50%)
- Idiopathic. ?hypersensitivity/allergic (eosinophilia 20%),
- Minimally painful - no pain, waddling gait
- Erythema, but lacks tenderness
- Testicular palpation difficult to perform,
 - unable to assess cremasteric reflex
- ➔ GET ULTRASOUND
- Resolves in 2-3 days



Series 82 children
Santi M, et al. Eur J Pediatr Surg 2018;
28:222–226

51

Acute Scrotal Pain and Masses

Acute, painful

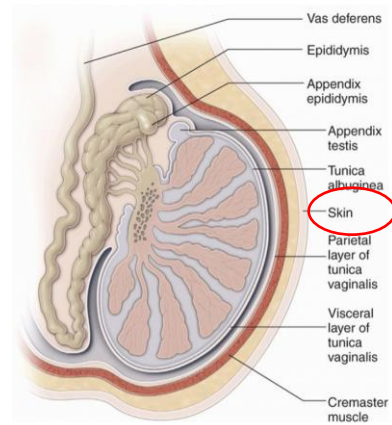
- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- Scrotal Abscesses/Fournier's

52

Acute Scrotal Pain and Masses

Acute, painful

- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- **Scrotal Abscesses/Fournier's**
 - 1) **Skin** – Staph/Strep
 - 2) **Intrascrotal**- persistent processes vaginalis
 - 3) Testicular – untreated epididymitis



53

Acute Scrotal Pain and Masses

Acute, painful

- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- **Scrotal Abscesses/Fournier's**
 - 1) Skin – Staph/Strep
 - 2) Intrascrotal- persistent processes vaginalis
 - 3) Testicular – untreated epididymitis



54

Fournier's Gangrene

- Men: women 10:1
- Risk factor: debilitated/immunocompromised
 - DM: 50%
 - chronic alcohol: 25-50%
- Source:
 - colorectal: 30-50%
 - urogenital: 20-40%
 - skin: 20%
- Presentation: **sepsis**, pain
 - early **black** perineal skin lesion
 - crepitus (50%)



Don't forget!!!
Exam genitals in
older/obtunded pts



55

Fournier's Gangrene: Facts

1. Dr. Fournier did not discover this entity
2. Testicles are spared.
3. SGLT2 association???

56

Fournier's Gangrene: Facts

1. Dr. Fournier did not discover this entity
2. Testicles are spared.
3. SGLT2 association???

Meta-analysis RCTs with 70,000 patients found:

3 cases in the SGLT2i arm versus 6 in the placebo arm¹

B. DECLARE-TIMI 58 trial → 1 case dapagliflozin vs 5 placebo²

C. Observational study, 1.8 million pts type 2 DM → no increase hospitalization rates for perineal necrotizing fasciitis with SGLT2i use²

¹Kittipibul V, Cox ZL, Chesdachai S, et al. Journal of the American College of Cardiology. 2024.

²O'Hara DV, Jardine MJ. Diabetes, Obesity & Metabolism. 2025.

57

Acute Scrotal Pain and Masses

Acute, painful

- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- Scrotal Abscess/Fournier's

Acute scrotal trauma



58



Acute Scrotal Trauma

Blunt trauma = 75-85%

- Lacrosse, 48.5
 - Wrestling, 32.8%
 - Baseball, 21%
 - Football, 17.8%
- Survey 731 high school
College athletes

Conservative care

- Scrotal contusion/hematoma
- Intratesticular contusion
- Hematocele
- Epididymal-- (-itis, hematoma)

To the OR/Urology

- **Testicular rupture**
- Testicular torsion
- **Expanding** scrotal hematoma

59



Acute Scrotal Trauma

Blunt trauma = 75-85%

- Lacrosse, 48.5
 - Wrestling, 32.8%
 - Baseball, 21%
 - Football, 17.8%
- Survey 731 high school
College athletes

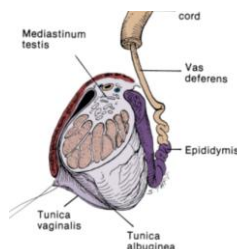
Conservative care

- Scrotal contusion/hematoma
- Intratesticular contusion
- Hematocele
- Epididymal-- (-itis, hematoma)

To the OR/Urology

- **Testicular rupture: R > L**
- Testicular torsion
- **Expanding** scrotal hematoma

Tear of tunica albuginea with
extrusion of seminiferous tubules and
loss of normal testicular contour



60



Acute Scrotal Trauma

Blunt trauma = 75-85%

- Lacrosse, 48.5
 - Wrestling, 32.8%
 - Baseball, 21%
 - Football, 17.8%
- Survey 731 high school
College athletes

Conservative care

- Scrotal contusion/hematoma
- Intratesticular contusion
- Hematocele
- Epididymal-- (-itis, hematoma)

To the OR/Urology

- **Testicular rupture**
- Testicular torsion
- **Expanding** scrotal hematoma

- Pain present
- Ecchymosis - common

Answer: ULTRASOUND

61



Acute Scrotal Trauma

Blunt trauma = 75-85%

- Lacrosse, 48.5
 - Wrestling, 32.8%
 - Baseball, 21%
 - Football, 17.8%
- Survey 731 high school
College athletes

Conservative care

- Scrotal contusion/hematoma
- Intratesticular contusion
- Hematocele
- Epididymal-- (-itis, hematoma)

To the OR/Urology

- **Testicular rupture n=1**
- Testicular torsion **n=1**
- **Expanding** scrotal hematoma

10 yr review Israeli military N=668

Mechanism	Number	%
Direct Injury From Any Object	390	58.4
Sport Injuries	96	14.4
Direct Injury From Weapon	72	10.8
Fall	63	9.4
Crawling	24	3.6
Wrestling	18	2.7
Motor Vehicle Injury	4	0.6
Testicular Grabbing	1	0.1
Total	668	100

Normal exam: 191 pts (28.6%)
 Scrotal tenderness: 479 pts (71.7%)
 Scrotal edema: 108 pts (16.2%)
 Scrotal hematoma: 32 pts (4.8%)
 Hematuria: 84 pts (12.6%)

96.3% discharged 😊



25% pain > 2 wks ☹️

Rottenstreich M, et al. MILITARY MEDICINE, 182, 9/10:e1929, 2017

62



Acute Scrotal Trauma

Blunt trauma = 75-85%

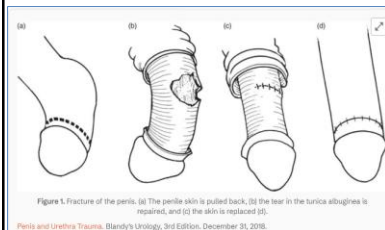
- Lacrosse, 48.5
 - Wrestling, 32.8%
 - Baseball, 21%
 - Football, 17.8%
- Survey 731 high school College athletes

Conservative care

- Scrotal contusion/hematoma
- Intratesticular contusion
- Hematocele
- Epididymal-- (-itis, hematoma)

To the OR/Urology

- **Testicular rupture**
- Testicular torsion
- **Expanding** scrotal hematoma



- Pain present
- Ecchymosis - common
*also common after--
vasectomy and penile fracture*



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Acute Scrotal Pain and Masses

Acute, painful

- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- Scrotal Abscess/Fournier's

Chronic, No pain

- **Testicular cancer**
- Inguinal-Scrotal hernia
- Hydrocele
- Varicocele
- Spermatocoele

Acute scrotal trauma

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Acute Scrotal Pain and Masses

Acute, painful

approx 10%¹

- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- Scrotal Abscess/Fournier's

Acute scrotal trauma

Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- Varicocele
- Spermatocoele

¹Singla N, et al. JAMA published online Feb 3, 2025

65

Acute Scrotal Pain and Masses

- Due to patent processes vaginalis

Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- Varicocele
- Spermatocoele

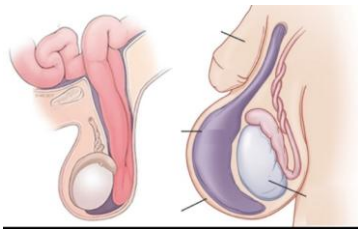
66

Acute Scrotal Pain and Masses

Pediatrics

Due to Patent processes vaginalis

hydrocele can wait up to **2 years** before the surgery for spontaneous obliteration of the processus vaginalis.



Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- Varicocele
- Spermatocele

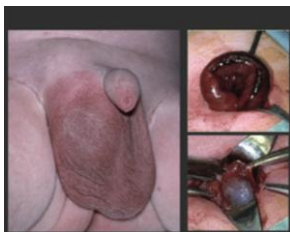
67

Acute Scrotal Pain and Masses

• Due to patent processes vaginalis

hydrocele can wait up to **2 years** before the surgery for spontaneous obliteration of the processus vaginalis.

- Can compress spermatic cord*
(infants 1-3 months)



dontforgetthebubbles.com

Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- Varicocele
- Spermatocele

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Acute Scrotal Pain and Masses

Pediatrics

Due to Patent processus vaginalis

hydrocele can wait up to 2 years before the surgery for spontaneous obliteration of the processus vaginalis.

Adults

Hernia acquired: weakened fibromuscular abdominal wall

Hydrocele: can be communicating vs. non-communicating

Chronic, No pain

- Testicular cancer
- **Inguinal-Scrotal hernia**
- **Hydrocele**
- Varicocele
- Spermatocele

Hernia



Hydrocele



Seker, D. JCAM 2015

elearning.reb.rw

69

Acute Scrotal Pain and Masses

- Due to patent processus vaginalis



??=>

51 million cases worldwide

Chronic, No pain

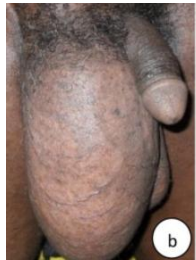
- Testicular cancer
- Inguinal-Scrotal hernia
- **Hydrocele**
- Varicocele
- Spermatocele

Okonofua, C, et al. Travel Med and Infect Dis 2011; 12: 95e101

70

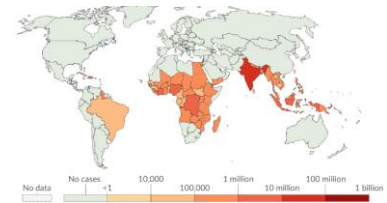
Acute Scrotal Pain and Masses

- Due to patent processes vaginalis



51 million cases worldwide

??=> Filariasis



Okonofua, C, et al. Travel Med and Infect Dis 2014; 12: 95e101

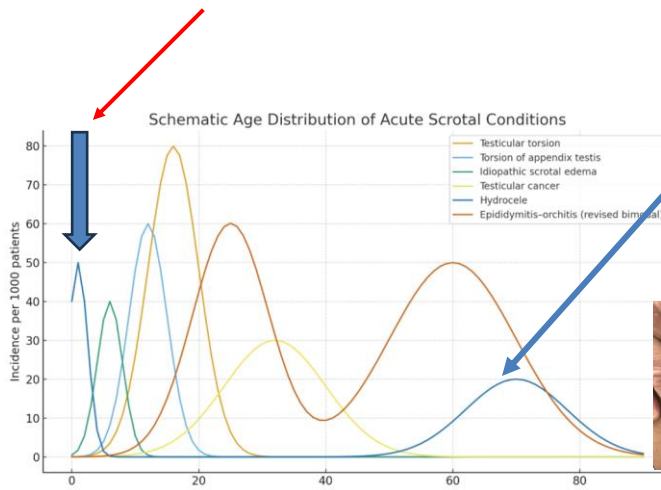
Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele**
- Varicocele
- Spermatocele

71

Acute Scrotal Pain and Masses

- Due to patent processes vaginalis



Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele**
- Varicocele
- Spermatocele

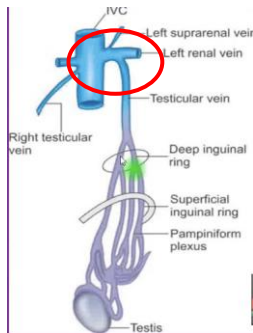


AFP Nov 2022

72

Acute Scrotal Pain and Masses

- 15% of men, ages 15-30 yrs
- Dull ache, “bag of worms”
- Location:
 - **75-90% Left side only**
 - **15-25% bilateral**
 - **1-2% Right side only**



Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- **Varicocele**
- Spermatocele

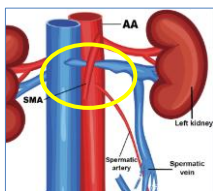


Exam Pearl: Standing
Valsalva does not work

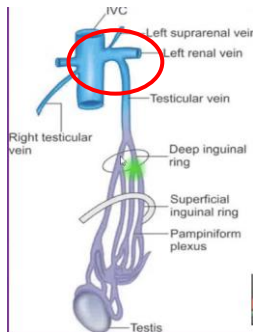
73

Acute Scrotal Pain and Masses

- 15% of men, ages 15-30 yrs
- Dull ache, “bag of worms”
- Location:
 - **75-90% Left side only**
 - **15-25% bilateral**
 - **1-2% Right side only**



Nutcracker Syndrome



Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- **Varicocele**
- Spermatocele

Nutcracker syndrome

Cause of varicocele:

30% adults¹

56% children²

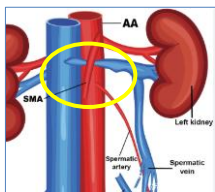
¹Mohammad A, et al J Ultrasound Med 2010

²Hannick JH, et al. Urology 2019

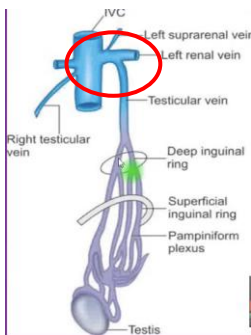
74

Acute Scrotal Pain and Masses

- 15% of men, ages 15-30 yrs
- Dull ache, “bag of worms”
- Location:
 - **75-90% Left side only**
 - **15-25% bilateral**
 - **1-2% Right side only**



Nutcracker Syndrome



Chronic, No pain

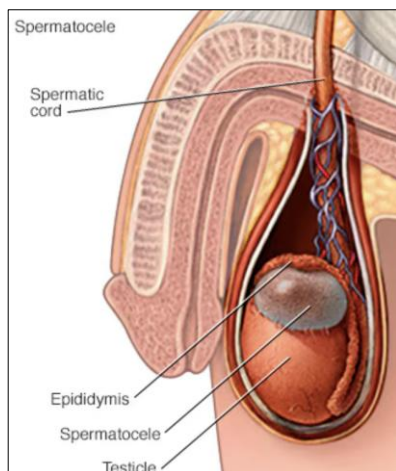
- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- **Varicocele**
- Spermatocele

Nutcracker syndrome: Presentation

Left flank pain (up to 100% pts)
 Hematuria (47-58%), Proteinuria (39-88%)
 Varicocele in males
 Pelvic congestion syndrome in women

75

Acute Scrotal Pain and Masses



Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- Varicocele
- **Spermatocele/ Epididymal cyst**

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Acute Scrotal Pain and Masses: Conclusion

Acute, painful

- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- Scrotal Abscess/Fournier's

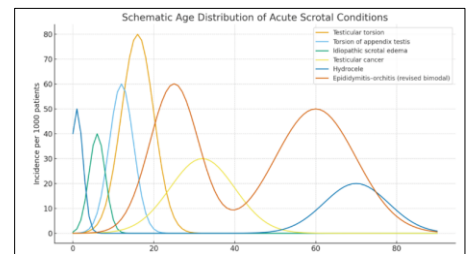
Acute scrotal trauma



Think...
Age group!!

Chronic, No pain

- Testicular cancer
- Inguinal-Scrotal hernia
- Hydrocele
- Varicocele
- Spermatocoele



77

Acute Scrotal Pain and Masses: Conclusion

Acute, painful

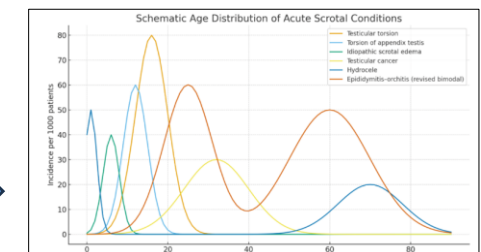
- Testicular torsion
- Epididymitis-orchitis
- Torsion appendix
- Idiopathic scrotal edema
- Scrotal Abscess/Fournier's

Acute scrotal trauma



*"Medicine is a science of uncertainty
....and an art of probability."*

William Osler



78

ARS Question #1

A 9-year-old boy presents with sudden onset left scrotal pain that started 12 hours ago. No nausea, vomiting, or fever.

Exam: child appears comfortable (on iPad). On exam, (+) significant tenderness on palpation of the upper pole of the left testicle. No significant swelling, erythema, or scrotal discoloration. The cremasteric reflex is present bilaterally. Urinalysis is normal.

Which of the Following Is the Most Likely Diagnosis?

- A. Testicular torsion
- B. Epididymitis
- C. Torsion of the testicular appendix
- D. Inguinal hernia



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ARS Question #2

A 25-year-old presents with 24 hours of progressively worsening right scrotal pain. No recent trauma. No nausea, vomiting, or fever.

Denies dysuria, hematuria or discharge

Exam: Appears comfortable. Scrotum: swollen, soft, tender testicle.

Testicle not high riding. The cremasteric reflex is present bilaterally.

Urinalysis is normal.

Which Clinical Decision Instrument Has Been Prospectively Evaluated to Risk Stratify Testicular Torsion as “Low Risk” in This Case?

- A. TWIST score
- B. Cremasteric plus score
- C. BAL scoring system
- D. AI score



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Most Important Not to Miss Diagnoses:

- **Testicular rupture:** This represents parenchymal laceration with tunica albuginea disruption and requires urgent surgical exploration within 3 days for optimal testicular salvage. Ultrasound findings include loss of testicular contour, heterogeneous parenchyma, and tunica albuginea defects, though the capsular defect may not always be visible. When ultrasound is inconclusive but clinical suspicion remains high, do not delay surgical exploration.[1][3]
- **Testicular torsion:** Trauma can precipitate or unmask torsion, particularly in patients with anatomic predisposition. The TWIST score helps risk stratification: high-risk patients (score 5-7) have 86.7% probability of torsion and warrant immediate exploration, while low-risk patients (score 0-2) have only 2.2% probability. Key findings include absent cremasteric reflex, high-riding testis, hard testis, nausea/vomiting, and testicular swelling.[4-5]
- **Expanding scrotal hematoma:** An isolated, expanding hematoma without testicular rupture requires surgical drainage to prevent scrotal pressure necrosis and impaired testicular perfusion.

Most Likely Diagnoses:

- **Scrotal contusion/hematoma:** Blunt trauma commonly causes bleeding into the scrotal wall or dartos layer, presenting with ecchymosis and swelling without testicular injury.[1]
- **Testicular contusion:** Direct impact can cause intratesticular injury with an intact tunica albuginea, manifesting as pain and swelling with heterogeneous parenchyma on ultrasound.[1]
- **Hematocele:** Blood accumulation between the visceral and parietal layers of the tunica vaginalis occurs when trauma disrupts scrotal vessels, creating fluid collection around the testis.[1]
- **Epididymal injury:** Trauma can cause epididymal hematoma or secondary epididymitis, presenting with posterior scrotal tenderness and swelling.[2]
- **Intratesticular hematoma:** Contained bleeding within an intact tunica albuginea can occur after blunt trauma and requires monitoring for potential ischemia.[1]

The American Urological Association recommends early scrotal exploration in all patients suspected of testicular rupture to prevent testicular loss, infection, chronic pain, infertility, and altered self-image

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Fertility Rates: Varicocele vs. Orchiectomy The Paradox

The key difference is: mechanism of injury
(rather than simply the reduction in testicular tissue)

Varicocele causes ongoing bilateral testicular damage:

- via **continuous pathological environment** affects both testes, even when unilateral.
 - venous stasis in the pampiniform plexus, which increases **scrotal temperature** and generates **elevated reactive oxygen species** → damages sperm DNA, lipid membranes, and disrupts spermatogenesis in both testes through testicular hyperthermia, hypoxia, and blood-testis barrier disruption.
- The damage is **progressive** — varicocele grade correlates with worsening semen parameters and hormonal dysfunction.
- Varicocele repair **removes the ongoing insult**, allowing spermatogenesis to recover.

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Fertility Rates: Varicocele vs. Orchiectomy The Paradox

Factor	Varicocele	Unilateral Orchiectomy
Mechanism	Ongoing bilateral oxidative/thermal stress	Removal of one testis; remaining testis in normal environment
Effect on contralateral testis	Continuous damage via hyperthermia, ROS	No ongoing damage; compensatory function
Reversibility	Repair removes insult → recovery	N/A (testis removed)
Paternity rates	17–21% untreated; 35–48% after repair	~92% (surveillance only)

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Testicular Torsion: Pitfalls

- Not reading Ultrasound report (body)
- Younger age, atypical presentations: Abdominal pain, vomiting
- Intermittent torsion
- Mimics of torsion:
 - inguinal hernia
 - hydrocele
 - systemic vasculitis (Henoch-Scholein purpura – 2-38%)
 - drug mediated vasoconstriction (methamphetamine/cocaine)

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Torsion of the testicular appendix most commonly occurs in prepubescent boys because the appendix testis (a müllerian duct remnant) is present in approximately 85% of children and undergoes relative enlargement during the prepubertal period, increasing its susceptibility to torsion.[1]

The peak incidence occurs between ages 8-11 years, with the condition being most common in preadolescents.[2-3] During this developmental stage, the appendix testis—a small pedunculated structure at the superior pole of the testicle—becomes proportionally larger relative to surrounding structures, making it more prone to twisting on its stalk and subsequent ischemic necrosis.

The blue dot sign is present in a minority of cases of testicular appendix torsion, with reported frequencies ranging from approximately 10-26% in surgical series. While this sign is considered pathognomonic when present, its absence does not exclude the diagnosis.

In a large retrospective study of 241 boys with acute scrotal pain, the blue dot sign was significantly associated with appendix testis torsion ($P < .001$) and was identified as one of the best clinical predictors for distinguishing this condition from epididymitis.[1] However, in another series of 19 patients with confirmed torsion of testicular or epididymal appendages, **none of the patients demonstrated the blue dot sign on physical examination.**[2]

Similarly, a study of 101 children with testicular appendage torsion found that while tender nodule was a common finding significantly associated with the diagnosis, the actual frequency of the classic blue dot sign was not specifically reported.[3] An older British series noted that torsion of a testicular appendage was "the most commonly misdiagnosed scrotal lesion, the preoperative diagnosis being correct in only 11 per cent of cases", suggesting that reliance on the blue dot sign alone leads to frequent missed diagnoses.[4]

The low sensitivity of the blue dot sign means that Doppler ultrasonography remains essential for diagnosis, particularly to exclude testicular torsion. The typical ultrasound findings include a round or oval avascular lesion with heterogeneous echotexture adjacent to the upper pole of the testis, with hyperemia of surrounding structures.