

Testicular Torsion

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Abstract

Testicular torsion is a cause of acute scrotal pain and represents a true surgical emergency. Torsion of the spermatic cord compromises blood flow to the testis and, if not promptly addressed, can lead to irreversible ischemic damage. Timely surgical exploration and orchiopexy are essential for testicular salvage. Color Doppler US serves as a valuable diagnostic tool; particularly, clinical findings are equivocal.

Keywords: genitourinary, scrotum, malposition

Case Summary

An adolescent male presented with 4 days of left testicular pain and swelling.

Imaging Findings

US of the scrotum (Figure 1) showed the left testis to be enlarged with heterogeneous echotexture and no color Doppler flow.

Diagnosis

Testicular torsion.

The differential diagnosis for acute scrotal pain in children and adolescents includes testicular torsion, torsion of the testicular or epididymal appendage, epididymo-orchitis, and trauma.

Discussion

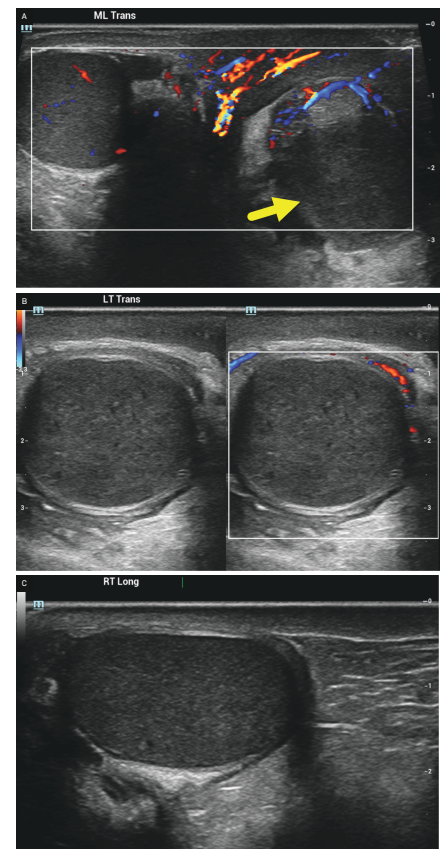
Testicular torsion is a relatively rare but urgent condition, affecting approximately 5.9 per 100,000 males under the age of 18 each year.¹ It occurs when the testis and spermatic cord twist, leading to reduced

arterial perfusion and obstructed venous drainage. This vascular compromise can quickly progress to testicular ischemia if not promptly addressed. Torsion most often occurs in males with a bell-clapper deformity, a congenital abnormality in which the testis lacks normal posterior anchoring and is free to rotate within the tunica vaginalis.²

Testicular torsion most commonly affects prepubertal and adolescent males. It is more common after 10 years of age as rapid pubertal growth is considered a contributing factor.² Additional risk factors include an undescended testis, prior episodes of intermittent torsion, scrotal trauma, and the presence of a bell-clapper deformity. Patients typically present with sudden onset of severe unilateral testicular pain, often accompanied by nausea, vomiting, and sometimes lower abdominal or scrotal pain.^{3,4}

To aid in clinical decision-making, the Testicular Workup for Ischemia and Suspected Torsion (TWIST) score⁵ can be used to stratify the risk of torsion based on physical exam findings. The 7-point scoring system includes testicular

Figure 1. (A) Transverse color Doppler US of the scrotum showing the left testis (arrow) to have absent internal blood flow. There is relative surrounding hyperemia. (B) Transverse image of the left testis with and without color Doppler showing the testis to be enlarged, have a mildly heterogeneous echotexture, and mild surrounding hyperemia. (C) Longitudinal US image of the normal right testis for comparison.



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swelling (2 points), hard testis (2 points), absent cremasteric reflex (1 point), nausea or vomiting (1 point), and high-riding testis (1 point).⁵ Scores of 0-2 indicate low risk, 3-4 intermediate risk, and 5-7 high risk for the presence of torsion. US is typically reserved for patients in the intermediate-risk group, while high-risk patients may proceed directly to surgical exploration.⁶ The TWIST score demonstrates high diagnostic performance, with a sensitivity of 95.5%, specificity of 97.2%, positive predictive value of 93%, and negative predictive value of 97%.^{4,6}

US is the primary imaging modality used to diagnose testicular torsion. Grayscale findings in acute torsion may include testicular enlargement, abnormal orientation of the affected testis within the scrotum, and a spermatic cord knot representing the site of twisting. In the early phase of torsion, the testis may appear homogeneously echogenic. As ischemia progresses, the echotexture becomes increasingly heterogeneous.

Color flow Doppler US is more sensitive for definitive diagnosis. The hallmark finding is absent or significantly decreased intratesticular blood flow. Another key diagnostic feature is the whirlpool sign, which represents blood flow within a twisted spermatic cord.⁷ A positive finding warrants immediate urologic consultation to prevent irreversible ischemic damage.

Prompt restoration of blood flow to the ischemic testis is critical, with irreversible damage typically occurring after 4-8

hours of torsion.⁸ Manual detorsion may be attempted when immediate surgical intervention is unavailable, but its success rate is variable, ranging from 26% to 80%. Despite this, surgical intervention remains the gold standard and should always be prioritized over manual detorsion.

Manual detorsion is an emergency bridge to surgery procedure that is indicated to urgently restore blood flow to a torsed testicle. It usually involve laterally rotating the testes since most torsions are medially rotated. Therefore, the left testes is rotated in a clockwise manner and the right counterclockwise. The end point is to decrease pain and make the spermatic cord feel normal. This usually occurs after 180-720 degrees of rotation.⁸ Surgical management includes detorsion and orchiopexy, in which the testis is sutured to the scrotal wall to prevent recurrence. If the testis is nonviable, orchiectomy is performed. In cases where a bell-clapper deformity is identified, bilateral orchiopexy is recommended, as the anomaly is bilateral in up to 80% of patients.⁹

Conclusion

Testicular torsion is a cause of acute scrotal pain and represents a true surgical emergency. Torsion of the spermatic cord compromises blood flow to the testis and, if not promptly addressed, can lead to irreversible ischemic damage. Timely surgical exploration and orchiopexy

are essential for testicular salvage. Color Doppler US serves as a valuable diagnostic tool; particularly clinical findings are equivocal.

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