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UROLOGY

Better Diagnosis of Testicular Torsion

Source: Barboso JA, Tiseo BC, Barayan GA, et al. *Development and initial validation of a scoring system to diagnose testicular torsion in children.* *J Urol.* 2013;189(5):1859-1864; doi:10.1016/j.juro.2012.10.056

Investigators at Boston Children's Hospital and University of Sao Paulo sought to develop and validate a scoring system to diagnose testicular torsion (TT) based on presenting symptoms. The investigators first conducted a literature review to identify clinical variables associated with TT. Subsequently, they prospectively evaluated these variables in patients presenting to Boston Children's Hospital with acute scrotal pain between 2009 and 2012. Scrotal Doppler ultrasound, urinalysis, urine culture, and blood count were obtained in all patients. Using prediction models of the clinical variables that were independently associated with TT, the investigators created a scoring system that stratified patients into low, medium, and high risk categories. Lastly, this scoring system was retrospectively applied to patients presenting to Boston Children's with acute scrotum from 2007 to 2008 in order to validate its ability to predict TT.

In the prospective evaluation phase, 338 patients with acute scrotum were enrolled, of whom 51 were diagnosed with TT. The mean patient age was 11.6 years and all TT patients underwent surgery, with 36 testes being salvaged and 15 requiring orchiectomy. Clinical variables found to be independently associated with TT were nausea/vomiting, testicular swelling, high riding testis, transverse lie, hard testicle, thick spermatic cord, absent cremasteric reflex, and fixed scrotal skin to testis. The prediction model of choice featured testicular swelling (2 points), hard testis on palpation (2 points), nausea or emesis (1 point), high riding testis (1 point), and absent cremasteric reflex (1 point). Among

PICO

Question: Among boys with acute scrotal pain, is a scoring system to diagnose testicular torsion accurate?

Question type: Diagnosis

Study design: Prospective cohort

the study population, use of a score distribution of ≤ 2 for low risk of TT (no need for ultrasound), a score of 3 or 4 for moderate risk (ultrasound indicated), and a score of ≥ 5 for high risk (ultrasound obviated by need for surgical exploration) placed no patients with torsions in the low risk category (negative predictive value [NPV] was 100%) and only patients with torsions in the high risk category (positive predictive value [PPV] was 100%). There were 65 patients (19.2%) who fell into the moderate risk category, 12 of whom

had TT. In the retrospective validation phase, application of the scoring system also yielded a 100% PPV of TT for patients who scored as high risk (sensitivity 54%, specificity 100%) and 100% NPV for those who scored low risk (sensitivity 100%, specificity 97%).

The authors conclude that the proposed scoring system can reliably diagnose or exclude TT without a confirmatory ultrasound.

Commentary by

Aseem R. Shukla, MD, FAAP, Pediatric Urology, Children's Hospital of Philadelphia, Philadelphia, PA

Dr Shukla has disclosed no financial relationship relevant to this commentary. This commentary does not contain a discussion of an unapproved/investigative use of a commercial product/device.

TT, usually due to a spontaneous rotation of the spermatic cord, causes acute ischemia to the testicle and is a true surgical emergency. While presenting symptoms such as acute pain with nausea, scrotal swelling, erythema, and high riding testis are associated with TT, scrotal ultrasound is nearly always utilized to confirm the need for surgical intervention and rule out more common causes of scrotal pain such as torsion of the appendix testis or epididymitis.¹ This study found that 80% of patients either scored ≤ 2 (suggesting no ultrasound is needed because the NPV for TT was 100%) or ≥ 5 (PPV for TT was 100%, obviating the need for an ultrasound) on a TT scoring tool. This tool therefore suggests that the number of ultrasounds for acute scrotum could be reduced by as much as 80%.

Doppler ultrasound of the scrotum may definitively diagnose TT, but hospital processes inhibit immediate access to this diagnostic modality. Even in many tertiary pediatric centers, ultrasound technicians may not be on-site during the night, prolonging the time to examination. And emergency room scrotal pain algorithms that demand absolute reliance on ultrasound often unnecessarily delay immediate surgical referral.

The scoring system introduced in the present study should discourage delays inherent in ordering an ultrasound when the symptom score is ≥ 5 . Similarly, a score of 2 or less reliably predicts the absence of TT, but the desire to exclude other scrotal pathology, such as testicular mass or complex hydrocele, may still warrant imaging. The potential impact of medical cost savings and reduced testicular ischemia time by obviating ultrasound is significant, and mandates multicenter validation of this innovative approach to TT.

References

1. Liguori G, et al. *World J Urol.* 2011;29(5):639-643; doi:10.1007/s00345-011-0698-8

Key words: testicular torsion, scrotal pain, scrotal ultrasound

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