Male Genitourinary Emergencies
An Evidence-Based Approach

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1. Truth of Fiction? The Presence of an Intact Cremasteric Reflex Excludes Testicular Torsion

1) Classic Teaching

   a) Reflex Present: The presence of an intact cremasteric reflex excludes testicular torsion
      i) Rabinowitz[1] in 1984 made the observation that the correlation between the *presence* of the ipsilateral cremasteric reflex and the absence of testicular torsion was 100 percent. The *absence* of this reflex increases the suspicion of testis torsion; however, it may be absent in a number of other conditions (including epididymo-orchitis), or in otherwise healthy individuals
      ii) Subsequent series confirmed these early findings [2,3]

2) More "Recent" Evidence

   a) Several case reports demonstrating testicular torsion presenting with an intact cremasteric reflex:
      i) Feldstein[4] (1985) (2 cases – letter to editor re: Rabinowitz case and, in reply, Rabinowitz himself noted that he was aware of an additional case)
      ii) Hughes et al[5] (2001)
      iii) Nelson et al[6] (2003)
   b) The presence of the cremasteric reflex is somewhat variable even among healthy males without scrotal pain, thereby hampering its overall utility as a diagnostic aid
      i) One study of 225 healthy boys between 0 and 12 years of age showed that its presence was particularly variable in the 0 to 30 month age group (present only around 50% of the time)[7]

3) Bottom Line

   a) Like all tests, the cremasteric reflex requires interpretation within the context of the overall clinical picture. One cannot rely solely on a *present* cremasteric reflex to *exclude* testicular torsion.

2. Truth of Fiction? A Normal Testicular Sonogram Excludes Testicular Torsion

1) Classic Teaching

a) Color Doppler Ultrasonography (CDUS) has long been regarded as the diagnostic modality of choice in *indeterminate* presentations of testicular torsion
b) Initial reports in early 1990's regarding the limitations of sonography in the diagnosis of testicular torsion (i.e. false negative sonograms)
   i) Burks et al[8] (1990) – one of the initial reports; one false negative in 32 cases
   ii) Ingram et al[9] (1993) – case report
   iii) Steinhardt et al[10] (1993) – case series (2 patients)
   iv) Yazbeck et al[11] (1994) – 2 false negatives in 19 cases
   v) Allen et al[12] (1995) – case series (5 cases)
   vi) Stehr et al[13] (2003) – one false negative in 132 cases
   vii) Frauscher[14] (2001)
c) However, the most concerning data:
   i) Baud et al[15] (1998): 6 of 23 cases [26%] of confirmed testicular torsion had ***flow demonstrated*** on CDUS!
   ii) Kalfa et al[16] (2007): 50 of 208 cases [24%] of confirmed testicular torsion had ***flow demonstrated*** on CDUS!

2) Recent Evidence

a) Addition of high resolution ultrasound (HRUS) imaging of the spermatic cord itself to standard CDUS imaging of the testicle may improve diagnostic accuracy
   i) Initial reports: Baud et al[15] (1998); Arce et al[17] (2002), and Kalfa et al[18] (2004)
   ii) However, Karmazyn et al[19] (2004) noted limitations of HRUS cord imaging:
      (1) Spermatic cord may appear normal when there is intermittent torsion-detorsion
      (2) A *tortuous* spermatic cord (as seen in epididymitis) is difficult to differentiate from a "*coiled*" spermatic cord seen with testicular torsion
b) Latest (and greatest) overall "evidence" → Kalfa et al[16] (2007):
   i) Multicenter, 919 patients (208 patients with proven testicular torsion)
   ii) HRUS was highly sensitive for ruling-in, and highly specific for ruling-out spermatic cord torsion
      (1) Sensitivity: HRUS detected a "twist" of the cord in 96% (199/208) of patients with testicular torsion
      (2) Specificity: HRUS revealed a normal "linear" cord in 99% (705/711) of patients without testicular torsion
      (3) However, HRUS technique requires skill and is operator-dependent
   iii) Authors concluded that, given its sensitivity and specificity, HRUS (in addition to standard CDUS) can significantly improve the management of children presenting with an acute scrotum

3) Bottom Line

a) CDUS for the diagnosis of testicular torsion has its limitations – false negatives may occur. The addition of HRUS evaluation of the cord itself appears to have a role in improving the overall diagnostic accuracy of sonography

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[2] Caldamome AA, Valvo JR, Altebarmakian VK et al. Acute scrotal swelling in children. J Pediatr Surg 1984;19:581-4. (prospective, 150 patients)
[3] Melekos MD, Asbach HW, Markou SA. Etiology of acute scrotum in 100 boys with regard to age distribution. J Urol 1988;139:1023-5.
[4] Feldstein MS. Re: The importance of the cremasteric reflex in acute scrotal swelling in children. J Urol 1985;133:488 (case report, letter)
[5] Hughes ME, Currier SJ, Della-Giustina D. Normal cremasteric reflex in a case of testicular torsion. Am J Emerg Med 2001;19:3:241-2. (case report)
[6] Nelson CP, Williams JF, Bloom DA. The cremasteric reflex: a useful but imperfect sign in testicular torsion. J Pediatr Surg 2003;38:1248-9. (case report)
[7] Caesar RE, Kaplan GW. The incidence of the cremasteric reflex in normal boys. J Urol 1994;152:779-80. (prospective, 225 patients)
[8] Burks DD, Markey BJ, Burkhard TK et al. Suspected testicular torsion and ischemia: evaluation with color Doppler sonography. Radiology 1990;175:815-21. (prospective, 32 patients)
[9] Ingram S, Hollman AS, Azmy A. Testicular torsion: missed diagnosis on color Doppler sonography. Ped Rad 1993;23:483. (case report)
[10] Steinhardt GF, Boyarsky S, Mackey R. Testicular torsion: pitfalls of color Doppler sonography. J Urol 1993;150:461-2. (case series, 2 cases)
[11] Yazbeck S, Patriquin HB. Accuracy of Doppler sonography in the evaluation of acute conditions of the scrotum in children. J Pediatr Surg 1994;29:9:1270-2. (prospective, 19 cases)
[12] Allen TD, Elder J. Shortcomings of color Doppler sonography in diagnosis of testicular torsion. J Urol 1995;154:4:1508-10. (case series, 5 cases)
[13] Stehr M, Boehm R et al. Critical validation of color Doppler ultrasound in diagnostics of acute scrotum in children. Eur J Pediatr Surg 2003;13:386-92. (prospective, 132 cases)
[14] Frauscher F, Klauser A, Radmayr C. Ultrasonographic assessment of the scrotum. Lancet 2001;357:721-2. (letter, one case)
[15] Baud C, Veyrac C, Couture A et al. Spiral twist of the spermatic cord: a reliable sign of testicular torsion. Pediatr Radiol 1998;28:950-4. (prospective, 30 patients)
[16] Kalfa N, Veyrac C, Lopez M et al. Multicenter assessment of ultrasound of the spermatic cord in children with acute scrotum. J Urol 2007;177:297-301. (multicenter; 919 patients total, 208 patients with testicular torsion)
[17] Arce JD, Cortes M, Vargas JC. Sonographic diagnosis of acute spermatic cord torsion. Rotation of the cord: a key to the diagnosis. Pediatr Radiol 2002;32:485-91. (prospective, 6 patients)
[18] Kalfa N, Veyrac C, Baud C et al. Ultrasonography of the spermatic cord in children with testicular torsion: impact on the surgical strategy. J Urol 2004;172:1692-5. (prospective, 44 cases of testicular torsion)
[19] Karmazyn B, Steinberg R, Kornreich L et al. Clinical and sonographic criteria of acute scrotum in children: a retrospective study of 172 boys. Pediatr Radiol 2004; 35(3):302-10. (retrospective, 41 cases of testicular torsion)