Abstract:
Acute scrotal pain is frequently encountered within pediatric emergency medicine and requires thoughtful and timely evaluation. The differential diagnosis for scrotal pain is broad and includes conditions such as epididymitis, torsion of the appendix testis, testicular torsion, trauma, and incarcerated hernia. Some of these conditions represent surgical emergencies and thus need to be identified expeditiously. Obtaining a careful history and physical examination is essential to the evaluation of a child with acute scrotal pain. A good clinical history and examination in combination with appropriate diagnostic tests provide the best method for obtaining an accurate diagnosis. Using 2 case-based scenarios, we will discuss important conditions, components to the evaluation, and management of a child with acute scrotal pain.

Keywords:
testicular torsion; epididymitis; torsion of the appendix testes; scrotal pain; scrotal trauma

*Division of Pediatric Urology, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL; †Department of Emergency Medicine, John H. Stroger, Jr, Hospital of Cook County, Chicago, IL.
Reprint requests and correspondence: Edward M. Gong, MD, Division of Pediatric Urology, Ann & Robert H. Lurie Children's Hospital of Chicago, 225 East Chicago Ave, Box 24, Chicago, IL 60611-2605.
eddiaz@luriechildrens.org (E.C. Diaz), EGong@luriechildrens.org (E.M. Gong)

1522-8401

Acute Scrotal Pain in Pediatric Emergency Medicine: Assessment, Diagnosis, Management, and Treatment

Edward C. Diaz, MD*, Deborah Kimball, MD, MBA†, Edward M. Gong, MD*

The acute scrotum is a condition of new onset pain, swelling, and/or tenderness of intrascrotal contents [1] and is commonly seen within pediatric emergency medicine. It is difficult to determine the incidence of acute scrotum within the population, as most studies within the literature are retrospective and are subject to selection bias. One study from a tertiary-level children's hospital in China reported 1228 cases of acute scrotum over the course of 18 years,[2] another series from a pediatric emergency department at a tertiary center in Israel identified 523 patients over 32 months,[3] and a series from an Australian tertiary-level children's hospital identified 204 patients over a 5-year period.[4] A prospective study regarding acute scrotal pain in the pediatric population was recently published from a

tertiary children's hospital in the United States with 85 000 annual visits. The study accrued their study population over 32 months and a total of 552 patients were seen for scrotal pain. Excluding for patients with more than 72 hours of symptoms, history of genitourinary (GU) surgery, known diagnosis before emergency department visit, and presence of hernia/hydrocele, the total number of patients was 450.[5] The volumes reported within these series demonstrate that the incidence of acute scrotal pain is not trivial and should serve as a reminder that one should be prepared for this clinical situation.

The differential diagnosis for acute scrotal pain is broad, and there are studies that have looked at the frequency of specific etiologies. Table 1 provides a general differential diagnosis for acute scrotal pain. Most studies identify torsion of appendix testis, epididymitis, and testicular torsion as the most common etiologies for acute scrotum, and it is important to keep these 3 conditions in mind when evaluating acute scrotal pain. The incidence of these 3 diagnoses within the last 2 published prospective series from tertiary-level children's hospitals is summarized in Table 2. The objective of this review will be to discuss the evaluation, diagnosis, and management of the child presenting with acute scrotal pain.

TABLE 1. Differential diagnosis for acute scrotal pain in the pediatric patient.

Abscess
Cellulitis
Epididymitis
Hernia
Hydrocele
Intrascrotal mass
Orchitis
Referred pain
Testicular torsion
Torsion of appendix testis
Trauma
Varicocele

TABLE 2. Incidence of testicular torsion, torsion of appendix testis, and epididymitis in pediatric acute scrotum.

	Acute Epididymitis	Testicular Torsion	Torsion of Appendix Testis
Boettcher et al.[6]	16.3%	11.5%	68.3%
Shah et al.[5]	19.3%	9.2%	22.8%

ACUTE SCROTAL PAIN

Case 1

An 8-year-old boy complains of severe scrotal pain over the last 20 hours. The patient states that he first noticed the pain after eating dinner while watching television 4 days ago. The pain was dull and aching and has been gradually worsening over the last 2 days, and especially severe over the last 20 hours. He denies trauma to the affected testicle and reports some increased swelling over the last 2 days. He denies nausea, vomiting, and fevers but reports having some dysuria over the last 2 days. There are no recent rashes or ear aches, and he is up to date with immunizations.

History of Present Illness

Obtaining a good history is essential to the evaluation of acute scrotal pain. The first component of the history should characterize the pain. Onset of pain is important to document because longer duration of symptoms translate to longer periods of ischemia with testicular torsion, which have been shown to result in lower chances of testicular salvage.[7,8] Acute onset of pain, defined as being less than 24 hours has been correlated with testicular torsion, and acute onset of pain should alert the physician to the possibility of testicular torsion.[6] Prior episodes of similar pain may alert the clinician to intermittent testicular torsion or recurrent epididymitis from a GU anomaly. The location of the pain is also important and should be specific. Asking a patient to point with 1 finger at the area of greatest pain can sometimes localize pain to a single site. If this site is at the superior pole of the testicle, pain could be from torsion of the appendix testis, and if localized to the posterior aspect of the testicle, pain could be from an inflamed epididymis. During the initial history, it is also important to obtain any provocative and palliative factors. Did the child recently have trauma to the groin during play, or was the child awakened from sleep in severe pain? Does the pain improve with scrotal elevation or support, or is there nothing that makes the pain better? The quality and severity of the pain are also important. Severe pain that has gradually improved may represent progression of testicular torsion to testicular necrosis, especially if the patient presents many hours to days after onset. In addition to pain, it is important to discuss any other visible changes