

Epididymitis in Childhood: A Clinical Retrospective Study over 5 Years

Baruch Klin MD¹, Lev Zlotkevich MD¹, Tifha Horne MD², Yigal Efrati MD¹, Francis Serour MD¹ and Gad Lotan MD¹

Departments of ¹Pediatric Surgery and ²Nuclear Medicine, Assaf Harofeh Medical Center, Zerifin [affiliated to Sackler Faculty of Medicine, Tel Aviv University], Israel

Key words: epididymitis, acute scrotum, technetium 99m scan, Doppler ultrasound, conservative management

Abstract

Background: Acute scrotal pain in children presents a major diagnostic and therapeutic challenge. Epididymitis has been considered uncommon in childhood. The clinical spectrum and therapeutic policy of the acute scrotum in children is continually being reassessed.

Objectives: To determine whether there has been an increase in the incidence of epididymitis in children and to advocate a more selective surgical approach to the acute scrotum.

Methods: We conducted a retrospective review of 65 children admitted to our department of pediatric surgery with the diagnosis of acute scrotum during a 5 year period.

Results: Of the 65 children admitted with the diagnosis of acute scrotum, epididymitis was diagnosed in 42 (64.6%). The remaining cases included torsion of the testis in 12 patients (18.5%), torsion of the appendix testis in 5 (7.7%), scrotal pain and minimal physical findings in 4 (6.1%), and scrotal hematoma and idiopathic scrotal edema in one patient each. Doppler ultrasound of the groin, color Doppler ultrasound of the testis and testicular nuclide scintigraphy (Tc-99m scan) examinations were performed on 49, 30 and 57 occasions, respectively; the Tc-99m scan was the most effective tool. All the patients with epididymitis were diagnosed before surgical intervention and were treated conservatively.

Conclusions: We observed an increasing frequency of epididymitis in children admitted with the diagnosis of acute scrotum.

IMAJ 2001;3:833–835

Acute scrotal pain in children presents a major diagnostic and therapeutic challenge. Of primary importance in each case is to ensure testicular viability through proper evaluation, prompt diagnosis, and surgical intervention when necessary. Since there is often overlapping of symptoms and signs among testicular torsion, torsion of the testicular appendages and epididymitis, it is essential that the physician note the specific clinical characteristics and perform a thorough physical examination and accurate imaging. A confident early diagnosis will increase the number of salvageable testicles and obviate unnecessary

surgical explorations. The purpose of this study was to review our experience with epididymitis in children, to stress its increasing frequency and to advocate a more selective surgical approach to the acute scrotum in children.

Patients and Methods

We reviewed the charts of 65 boys who were admitted to the Department of Pediatric Surgery with acute scrotum between the years 1987 and 1992. Acute scrotum was diagnosed whenever a child under the age of 17 years presented with acute symptoms of acute scrotal pain, together with signs of edema, erythema or induration. Also included in this study were boys with initial symptoms of abdominal pain who were ultimately diagnosed as having an acute scrotum. The information registered included age, which side was involved, the time from onset of symptoms to seeking medical attention, complaints on admission, physical findings, diagnosis, and therapeutic management. Doppler ultrasound of the groin was performed in the Emergency Room with a Mini Doppex D500 8Mhz (Huntleigh Technology, Medical Division, Luton, UK). Color Doppler ultrasound of the testis was performed in the radiological institute, with an Acuson 128XP/10 7.5 Mhz (Isramex, Israel). The technetium-99m pertechnetate scan (Tc-99m scan) was performed with a large field-of-view gamma camera (Elscint Apex Sp-4, Israel) sited with a low energy, all-purpose, parallel-hole collimator. This report concerns only the patients diagnosed as having epididymitis.

Results

Table 1 outlines the clinical features of epididymitis in the 42 patients presenting with this entity. The average age for acute epididymitis was 9 years (range 1.5–15 years). There was no significant difference in the side involved (44.2% on the right and 55.8% on the left). Boys with epididymitis presented with either acute or chronic testicular pain, in almost similar proportions, extending from 24 hours to 1 week with a peak on the second day (10 patients). A history of past episodes of similar pain was observed in 5 patients (11.9%). A current history of urinary tract infection was observed in 20% of the patients and a past urologic history in only two patients – epispadias and bladder extrophy that had been corrected in

Table 1. Clinical features of acute epididymitis in 42 children

Clinical features	No. of patients (%)
Less than 12 hr history	12 (28.6)
Acute testicular pain	21 (50.0)
Chronic testicular pain	18 (42.8)
Abdominal pain	1 (2.4)
Fever	4 (9.5)
Urinary tract infection	8 (19.0)
Scrotal redness	37 (88.0)
Scrotal swelling	37 (88.0)
Scrotal tenderness	39 (92.8)
Nausea and vomiting	2 (4.7)
Leukocyte count greater than 12.0 x 10/L	3 (7.1)
Past urologic history	2 (4.7)
Intercurrent disease	11 (26.2)
Undescended testis	None
Recurrent epididymitis	5 (11.9)

one, and hypospadias in the other. A history of direct trauma to the scrotum that preceded the pain and swelling was observed in some cases, which created some difficulty in reaching, but not ruling out, the diagnosis of epididymitis. The mean admission temperature was higher in boys with acute epididymitis when compared with those with torsion of the testis or appendix testis. Tenderness and induration localized to the epididymis supported the diagnosis. Abnormal urine analysis was found in the same proportions as in torsion of the testis or appendix testis. Only 7.1% of the patients had a total leukocyte count greater than 10,000/mm³, with a shift to the left.

Doppler ultrasound of the groin, color Doppler ultrasound of the testis and Tc-99m scan were performed on 35, 23 and 42 occasions, respectively, the Tc-99m scan being the most reliable diagnostic tool. The results for epididymitis were very convincing, with 41 positive scans of the 42 performed (97.6%). Only in one patient who was clinically diagnosed as having epididymitis, confirmed by color Doppler ultrasound, did the scan not rule out torsion of the testis. It was decided not to operate, and this patient's complaints subsided under conservative treatment.

Treatment of epididymitis incorporated bed rest, analgesia and systemic intravenous antibiotics. All 42 patients responded well to this therapeutic regimen. In a few cases, a change of antibiotics was necessary due to inadequate response. None of the patients underwent surgical exploration. Their long-term follow-up has been normal and without complications.

Discussion

The three major diagnostic categories in the differential diagnosis of acute scrotal pain in children are classically, in descending order: torsion of the testis, torsion of the appendix testis, and epididymitis. This was not the case in our series, which showed a surprisingly high occurrence of epididymitis, the main etiological factor, comprising 64.6% of all cases admitted.

Epididymitis has been considered uncommon in childhood.

Gierup et al. [1] published 48 cases seen during a 17 year period in Sweden. Gislason et al. [2] described their experience with 25 children with epididymitis diagnosed over a 5 year period. Melekos et al. [3] reported an incidence of 6% in a series of 100 boys with acute scrotum treated over 6 years. The present series includes 42 cases of epididymitis diagnosed over 5 years, representing 64.6% of all cases of acute scrotum in children treated at our institution during that period. This fact may indicate a higher incidence of epididymitis than previously thought, an extremely important observation, since surgical exploration can, and should be avoided in most of them. The policy of systematic prompt exploration should be questioned and reconsidered.

The pain accompanying epididymitis is usually gradual in onset, reaching a peak over several days. There is often discomfort and/or pain in the inguinal region, as well as in the scrotal area [4]. A history of past episodes of similar pain was observed in 11.9% of our patients. The patient may present with high temperature, but the white blood count and urine analysis are normal in most cases [5]. The urine cultures are often negative. A current history of urinary tract infection was observed in 20% of our patients and a past urologic history in only two (bladder extrophy/epispadias and hypospadias). Consequently, the necessity for a complete urologic investigation in every case of epididymitis in children, as suggested by most authors, is questioned. Siegel and coworkers [6] suggest that any prepubertal patient with epididymitis merits a complete urological evaluation, including a urine culture, voiding cysto-urethrography and excretory urography (intravenous pyelogram), to rule out an underlying urogenital anomaly. In their report on 48 children with epididymitis, 8 of 17 prepubertal patients had an underlying urogenital anomaly (47%), particularly those patients with positive urine cultures. Coliform urinary infections predominated. The anatomical anomalies included ureteric ectopia to the seminal vesicle or vas (from the upper pole of a duplex kidney), a duplicated urethra, bulbous urethral stricture, prostatic utricle, recto-urethral fistula and urethral-ejaculatory duct reflux. None of the 26 postpubertal patients had such an anomaly. Intravenous urography as a routine examination in epididymitis was also suggested by Kalovidouris et al. [7]. In contrast, at least in three reported series of boys with epididymitis, the results of radiological studies were unremarkable [2,8,9].

Trauma, virus, hematologic spread, urinary tract infection, and underlying urologic abnormalities have been considered possible etiological factors. Epididymitis has also been described with meningitis [10] and *Haemophilus influenzae* septicemia [11]. In our experience, most cases were idiopathic and non-specific.

In most cases, the correct diagnosis can be made on clinical grounds alone (history and physical examination), with the help of Tc-99m scan in equivocal cases only [12]. Tc-99m scans were performed in all patients with epididymitis reported here, with very convincing results: 41 were positive for epididymitis (97.6%). Radionuclide scrotal imaging with technetium-99m

sodium pertechnetate was first introduced by Nadel et al. in 1973 [13]. Since then, there has been substantial improvement and technical refinement, with excellent results being reported [14,15]. A recent study evaluating radionuclide scrotal scanning reported a test sensitivity of 100% and specificity of 93%; 42 patients who were treated conservatively based on scan results had normal testis at follow-up [16]. The authors concluded that the Tc-99m scan can clearly distinguish among testicular torsion, torsion of testicular appendages and epididymitis.

The diagnostic features of epididymitis on Tc-99m scan are increased perfusion to the involved hemiscrotum, and a "hot spot" in the static image, indicating increased blood flow to the scrotum due to the inflammatory process. There is hyperemia involving the head, body and tail of the epididymus, as well as the spermatic cord vessels, sparing the adjacent testis. All cases of epididymitis reported here demonstrated these classical features. False-positive results can be observed in cases of scrotal abscess, scrotal hematoma, testicular tumor, scrotal involvement in anaphylactoid purpura (Henoch-Shoenlein), missed torsion, torsion of the appendix testis, infected hydrocele, large varicoceles, and idiopathic scrotal edema.

Imaging of the acutely painful scrotum is a legitimate emergency, since testicular viability after torsion is dependent on the number of hours from the onset of pain to surgical treatment. The limitations of this investigation include the availability of the test "out-of-hours," the time taken to arrange it and the considerable expertise required to interpret the results. In a small country like Israel, where distances are short, scintigraphy is readily available 24 hours a day. The interval between admission of the patient and performance of the scan is approximately 40 minutes, with the examination itself taking another 5–10 minutes to complete. Interpretation of the study, by experts, is accurate. These conditions are mandatory in the decision-making process concerning the treatment of the acute scrotum in children. Some authors claim that most cases of "presumed" epididymitis in children, demonstrated by Tc-99m scan, are actually torsion of one of the testicular appendages, and that the only way of confirming the diagnosis is surgical exploration in all cases. We do not believe it ethical to operate on patients diagnosed clinically and by Tc-99m scan as having acute epididymitis, just to "confirm the diagnosis." Treatment of epididymitis consists of bed rest, systemic intravenous antibiotics, and analgesics.

The prognosis for children with epididymitis seems more favorable than for adults. Testicular atrophy is rare and there is no decrease in fertility. A selective approach to the treatment of the acute scrotum in children has been previously reported by us [17], with good results. The judicious use of sound clinical judgment, associated with Tc-99m scan, should enable the non-operative diagnosis of epididymitis in most cases. The policy of emergency scrotal exploration in all cases of acute scrotum and the consequent large number of unnecessary explorations could and should be avoided [18]. In our opinion, following this line of management would benefit most children, differentiating

between those boys who require surgical intervention and sparing those who do not. The increasing frequency of epididymitis observed by us in the present series (64.6%) may represent the trend of the future and should question the policy of systematic exploration of the acute scrotum in children. A policy of selective exploration is strongly recommended, based on the high number of surgical explorations avoided in our series by following this more critical approach.

References

- Gierup J, von Hedenberg C, Osterman A. Acute non-specific epididymitis in boys. *Scand J Urol Nephrol* 1975;9:5.
- Gislason T, Noronha RF, Gregory JG. Acute epididymitis in boys: a 5-year retrospective study. *J Urol* 1979;124:533–4.
- Melekos MD, Asbach HW, Markou SA. Etiology of acute scrotum in 100 boys with regard to age distribution. *J Urol* 1988;139:1023–5.
- Donohue RE, Utley WLF. Torsion of spermatic cord. *Urology* 1978;11(1):33–6.
- Wolin LH. On the etiology of epididymitis. *J Urol* 1971;105:531.
- Siegel A, Snyder H, Duckett JW. Epididymitis in infants and boys: underlying urogenital anomalies and efficacy of imaging modalities. *J Urol* 1987;138:1100–3.
- Kalovidouris A, Birch PA, Fletcher EWL. Intravenous urography as a routine examination in epididymitis. A re-evaluation. *Br J Urol* 1982;54:415.
- Anderson PA, Giacomantonio JM. The acutely painful scrotum in children. *Can Med Assoc J* 1985;132:1153–5.
- Likitnukul S, McCracken GH Jr, Nelson JD. Epididymitis in children and adolescents. *Am J Dis Child* 1987;141:41–4.
- Davis WH, Scardino PL. Meningitis presenting as epididymitis. *South Med J* 1972;65:936.
- Waldman LA, Kosloske AM, Parsons DW. Acute epididymoorchitis as the presenting manifestation of Hemophilus influenzae septicemia. *J Pediatr* 1977;90:87.
- Valvo JR, Caaldamone AA, O'Mara R, Rabinowitz R. Nuclear imaging in the pediatric acute scrotum. *Am J Dis Child* 1982;136:831–5.
- Nadel NS, Gitter MH, Hahn LC. Preoperative diagnosis of testicular torsion. *Urology* 1973;1:478–9.
- Chen D, Holder LE, Melloul M. Radionuclide scrotal imaging: further experience with 210 new patients. I. Anatomy, pathophysiology and methods. *J Nucl Med* 1983;24:735–42.
- Chen D, Holder LE, Melloul M. Radionuclide scrotal imaging: further experience with 210 new patients. II. Results and discussion. *J Nucl Med* 1983;24:841–53.
- Melloul M, Paz A, Lask D, Manes A, Mukamel E. The value of radionuclide scrotal imaging in the diagnosis of acute testicular torsion. *Br J Urol* 1995;76:628–31.
- Klin B, Zlotkevich L, Horne T, Livshitz G, Efrati Y, Vinograd I. A selective approach for the treatment of the acute scrotum in children. *Pediatr Surg Intern* 1996;11:483–6.
- Burgher SW. Acute scrotal pain. *Emerg Med Clin North Am* 1998;16(4):781–809.

Correspondence: Dr. G. Lotan, Dept. of Pediatric Surgery, Assaf Harofeh Medical Center, Zerifin 70300, Israel. Phone: (972-8) 977-9102, Fax: (972-8) 977-9108, email: klin2@netvision.net.il