

Acute Scrotum – Etiology and Management

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Abstract. Objective: Acute scrotal pain is a common urological emergency. Urgent exploration is the standard means of management, since no investigation can confidently exclude torsion of testis from the differential diagnosis. **Methods:** A review of all boys presenting with acute scrotal pain who underwent emergency scrotal exploration between January 1983 and March 2003 was performed. **Results :** 195 boys were included in this study. They were divided into 3 groups: group 1-73 with epididymo-orchitis, group 2-63 with torsion of testicular appendages and group 3- 57 with spermatic cord torsion. The patients in group 2 were older than group 1, also patients in group 1 were older than group 3. During neonatal period the most common pathology was spermatic cord torsion, whereas in prepubertal period torsion of appendages was more common. In all boys, mean duration of pain at presentation was 2.11 days. Epididymo-orchitis was diagnosed in 37% of patients, with torsion of the appendages being the next most common entity. Testicular torsion was diagnosed in 29% of patients. In the group with testicular torsion salvage rate of testis was 37% because of late admission. The perioperative morbidity and mortality was not seen in any of the groups. **Conclusion:** We believe that any boy with acute scrotal pain and any suspicion of testicular torsion in physical examination must be applied routine surgical exploration. [Indian J Pediatr 2005; 72 (3) : 201-203]
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Acute scrotum is defined as an acute painful swelling of the scrotum or its contents accompanied by local signs and general symptoms. The differential diagnosis of an acute scrotum includes spermatic cord torsion, torsion of testicular appendage, epididymo-orchitis, trauma, incarcerated hernia, and tumor.^{1,2} The acute scrotum is a diagnostic dilemma because of its diverse etiologies and extreme tenderness over the area that makes clinical examination difficult. Torsion of the spermatic cord is of major concern because it requires immediate surgical intervention.^{1,3} The aim of our study has been to evaluate the findings in boys operated on acute scrotum.

MATERIALS AND METHODS

Medical records of boys who underwent surgical exploration for acute scrotum in Dr. Sami Ulus Children's Hospital, Ankara, Turkey (a tertiary pediatric care center) between January 1983 and March 2003 were analysis. Boys with incarcerated inguinal hernia and testicular tumors were excluded. 195 consecutively treated boys were included in this review. The data were analyzed using SPSS 11.5 for Windows statistical program. For statistics the Mann-Whitney U-test was used.

RESULTS

The sample size of 195 boys were divided into 3 groups

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(Table 1); group 1; epididymo-orchitis, group 2; torsion of testicular appendages, group 3; spermatic cord torsion, and other conditions (trauma). Emergency operation was performed on every boy.

The boys with epididymo-orchitis were older than those with spermatic cord torsion (mean age 6.64 years vs 4.63 years). The boys with torsion of testicular appendages were also older than those with epididymo-orchitis (mean age 8.45 years) (Fig. 1). The difference between means was statistically significant ($p < 0.05$). During neonatal period, the most common pathology was

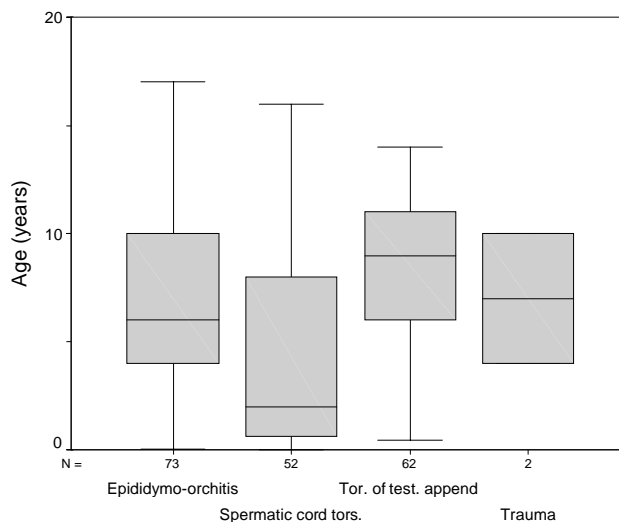


Fig 1. Ages of boys with acute scrotum

spermatic cord torsion. In pre-pubertal period, torsion of appendages was the most common pathology. In all the boys, mean duration of pain at presentation was 2.11 days (range 12 hours to 7 days), and mean duration from admittance to inguinal exploration was 2:33±0:15 hours. The overall incidence of pre-operative clinical features and physical examination findings is shown in Table 2. There was no statistical difference between the three groups.

Routine radiological imaging was not used in the management of the acute scrotum because of the inherent delay and the risk of misdiagnosis. Color Doppler ultrasound was performed if it was available and would not have caused delay.

In group 1, the right testis was affected in 49 (67%) of 73 cases, and the left side was affected in 24 (33%). All patients were treated with IV antibiotics. 21 of 73 had diagnostic studies to identify any associated urinary tract pathology. A urethral stricture and a vesicoureteral reflux were identified.

In group 2; the right side was affected in 39 (62%) of 63 cases, and the left side was affected in 24 (38%). 53 of 63 were torsion of testicular appendages, 9 were torsion of epididymal appendages and one was torsion of paradidymis or Giraldés' organ. There was a prevalence of cases in cold months; only 9.5% of torsion of appendages was noted in summer.

In group 3; the left testis was affected in 39 (68%) of 57 cases, and the right side was affected in 18 (32%). No bilateral torsion or recurrent torsion occurred after

previous testicular fixation. At exploration, in 39 (68%) of the cases testes were in the scrotum, in 2 (4%) of the cases at the external ring and in 16 (28%) of the cases in the inguinal canal. 17 inguinal hernias and a contra lateral undescended testis were noted as associated anomaly. 13 cases were extravaginal torsion and 43 were intravaginal torsion (in one case it was not noted). Only 2 of extravaginal torsions were beyond neonatal period. In 21 cases, clinically viable testes were detorsed and fixation was performed, with testis salvage rate of 37% (21/57). In remaining 36 (63%) a non-viable testis was surgically removed. All boys underwent fixation of contra lateral testis. Mean duration of pain at presentation was 1.35 days (range 12 hours – 3 days) when the testis was salvaged by detorsion. In contrast, mean duration of pain at presentation was 3.08 days (range 1day – 7 days) when the testis was removed. The difference between means was statistically significant ($p < 0.05$). The testis detorsed with 3 days duration of pain had only 360-degree torsion. Testicular condition at one month of follow up was available in 20 cases (20/21; 95%) of detorsed spermatic cord torsion. The testis was normal in 18 (90%) of 20 patients of detorsion with fixation and mild atrophy was noted in 2 (10%).

DISCUSSION

The testis salvage rates in boys with spermatic cord torsion are reported to range from 26 to 87%.^{1,4} The salvage rate in *Jefferson's* series was 61%, but the mean

TABLE 1. Patient Characteristics

| Diagnosis | Group | Patients | Mean age | Range |
|------------------------|-------|-----------|------------|-----------------------|
| Epididymo-orchitis | 1 | 73 (37.4) | 6.64 years | 11 days -17 years |
| Torsion of appendages | 2 | 63 (32.3) | 8.46 years | 5,5 months - 14 years |
| Spermatic cord torsion | 3 | 57 (29.2) | 4.63 years | 4 days – 16 years |
| Others (trauma) | | 2 (1) | | |
| Total | | 195 (100) | 6.68 years | 4 days – 17 years |

TABLE 2. Pre-operative Clinical Features and Physical Examination Findings of Boys

| | Epididymo-orchitis (n=73) | Torsion of appendages (n=57) | Spermatic cord torsion (n=63) |
|--------------------------------------|------------------------------|---------------------------------|----------------------------------|
| <i>Presenting Symptoms</i> | | | |
| Testicular pain | 72 | 56 | 63 |
| Swelling | 36 | 32 | 36 |
| Abdominal pain | | | 1 |
| Vomiting | | | 1 |
| Fever | | 1 | |
| Dysuria | | | 1 |
| <i>Physical examination findings</i> | | | |
| Tender | 54 | 56 | 52 |
| Erythema - ecchymosis | 36 | 25 | 17 |
| Inguinal mass | | 1 | 18 |
| Inguinal hernia | | | 17 |
| Transverse lying testis | | | 2 |
| Contralateral undescended testis | | | 1 |

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duration of pain was 12 hours (40 minutes to 12 hours)⁴. In *Mushtaq's* series, the overall salvage rate was 70%, but when the duration of symptoms exceeded 12 hours the salvage rate dropped to 30%.³

The low salvage rate in spermatic cord torsion is secondary to misdiagnosis and delayed presentation. In the present series, the salvage rate of testis was quite low as 37%, but the minimum duration of pain was 12 hours and the mean duration of pain was 2.41 days in boys with spermatic cord torsion, and only 4 of them were misdiagnosed elsewhere by non surgeons. The boys, suffering from acute scrotal pain, were presented to medical facilities too late. The greatest impact on testicular preservation lies with the effective education of parents about the danger of acute scrotal pain.

Theoretically, the combination of intermittent and variable degrees of torsion may allow a testis to survive beyond 12 hours symptomatology (both are impossible to detect clinically). In previous series, detorsion and orchiopexy were done to clinically viable testis until 48 hours.¹ In our series, a viable testis was found with 3 days duration of pain.

Undescended testes undergo torsion ten times as often as normal descended testes. The anatomical condition which predisposes to torsion of the testis is an abnormality of the suspension. These abnormalities are presumably more common in undescended testes and are often bilateral.⁵ In the present series, 19 (33%) of 57 boys showed undescended testis either on the involved or the contra lateral side.

The paradidymis or Giralde's or Henle's paraepididymis is rarely found at autopsy and even more rarely recognized clinically. The most frequently observed pathological alterations are cystic transformation and torsion, the latter being a possible cause of acute scrotum. It is generally located in the anterior and inferior portion of the spermatic cord, 1 to 3 mm below the caput epididymis, without relationship with the epididymis or with the testis. Orazi reported 2 cases of paraepididymal torsion in a series of 64 cases of testicular appendage torsion, and Randall reports only one case in 73 cases of testicular appendage torsion.⁶ In the present series, there is one torsion of paradidymis or Giralde's organ.

For torsion of testicular appendages, some authors recommend conservative treatment, once the diagnosis of torsion of spermatic cord is ruled out. The authors think surgical treatment is appropriate for torsion of appendages because almost all boys were presented with intense symptoms to warrant surgery.⁷

However, policy of aggressive immediate exploration of acute scrotum in children resulted in the exploration of as many patients with epididymo-orchitis as patients with spermatic cord torsion; prompt surgical exploration without delay by diagnostic imaging studies maximizes testicular salvage as torsion of spermatic cord with prolonged symptoms increases the risk of testicular loss. Exploration is a relatively safe and simple procedure and allows an accurate diagnosis and fixation of the contra lateral testicle, if indicated.

As in all conditions, the history and physical examination must be individualized. The differential diagnosis of the acute scrotum remains difficult in some patients. A high index of suspicion is required by primary care physicians in patients with a unilateral acute scrotal pain.

REFERENCES

1. Cass AS, Cass BP, Veeraraghavan K. Immediate exploration of the unilateral acute scrotum in young male subjects. *J Urol* 1980; 124: 829-832
2. Doehn C, Fornara P, Kausch I, Büttner H, Friedrich HJ, Jocham D. Value of acute-phase proteins in the differential diagnosis of acute scrotum. *Eur Urol* 2001; 39: 215-221.
3. Mushtaq I, Fung M, Glasson MJ. Retrospective review of paediatric patients with acute scrotum. *ANZ J Surg* 2003; 73: 55-58.
4. Jefferson RH, Pérez LM, Joseph DB. Critical analysis of the clinical presentation of acute scrotum: A 9-year experience at a single institution. *J Urol* 1997; 158: 1198-1200.
5. Anderson L, Wille-Jørgensen PA. Torsion of the testis A 5-year material. *Scand J Urol Nephrol* 1990; 24: 91-93.
6. Orazi C, Fariello G, Malena S, Caterino S, Ferro F. Torsion of paradidymis or Giralde's organ: An uncommon cause of acute scrotum in pediatric age group. *J Clin Ultrasound* 1989; 17: 598-601.
7. Sarria A, Oliván G, Fleta J, López JA, Bueno M. Torsion of testicular appendixes as the most frequent cause of acute scrotal inflammation in infancy. *AJDC* 1988; 142: 810.

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