



## A Study of Acute Scrotum in Pediatric Patients

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### Abstract

**Background:** *The diagnosis of Pediatric acute scrotal pain can be one of the most interesting and challenging aspects in medicine. Clinical signs may be inconsistent and investigations are not always definitive in establishing the diagnosis. We now review the different etiologies, differential diagnosis and management strategies of acute pediatric scrotum.*

**Methods:** *A retrospective review of all recorded cases of acute scrotal pain in patients aged 12 years or below admitted at SKN medical college hospital, Pune between January 2009 and October 2017.*

**Results:** *Out of 150 cases, Torsion of testis (46) was commonest cause of acute scrotum followed by incarcerated inguinal hernia (45), torsion of testicular appendage (40), epididymo-orchitis (10), idiopathic scrotal edema (6), hematocele (2) and pyocele (1). Most (36%) of the patients were in the first year of life. The commonest signs were pain and swelling (66%) followed by pain, swelling and redness (18%) and pain alone (14%). 118 patients consisting of 46 with torsion of testis, 15 with torsion of testicular appendage, 45 with incarcerated hernia, 9 with epididymo-orchitis, 2 with haematocele and one with pyocele underwent surgical exploration. 20 patients with torsion of testis had orchiectomy and orchiopexy of contra-lateral testis and the rest had detorsion and bilateral orchiopexy.*

**Conclusion:** *Regardless of the etiology, it is of great importance that the patient seeks medical assistance promptly. Early exploration of scrotum based on careful physical examination excludes the risk of misdiagnosis and unnecessary delay by diagnostic techniques.*

**Keywords:** *scrotal pain, Scrotal swelling, Testicular torsion.*

### Introduction

Acute scrotum is defined as an acute painful swelling of the scrotum or its contents accompanied by local signs and general symptoms. Acute pediatric scrotal pain sometimes

requires prompt surgical intervention and therefore accurate diagnosis of different etiologies of acute scrotal pain has great therapeutic and prognostic significance<sup>1</sup>. In clinical practice, acute testicular torsion (TT) accounts for 80–90% of the

acute pediatric scrotum at presentation<sup>2</sup>. The pediatric acute scrotum can present right from the new born patients to adolescent patients. The peak incidence of pediatric TT is bimodal with the main peak between 12 and 18 years and smaller peak in the first year of life. In a recent large study by Zhao et al.<sup>3</sup>, looking at the incidence of TT confirmed that TT is uncommon but the rate of orchidectomy is high, especially in the youngest patients. Additional causes of the acute pediatric scrotum include torsion of a testicular appendage (hydatid of Morgagni), epididymo-orchitis, idiopathic scrotal edema, acute hydrocele and Henoch-Schönlein vasculitis. The most difficult situation arising with the acute pediatric scrotum is the instant diagnosis. To date there is no single definitive test (clinical or radiological) available that can exclude a TT safely without the need for exploration. The diagnosis is largely based on the history at presentation and clinical findings that assist in the diagnosis. Only 50% of patients however have the complete 'classic' symptoms and findings of an etiology at presentation. In most situations clinical examination detects the presence of a swollen, erythematous and tender scrotum. The symptom of 'pain' alone is not characteristic of any specific etiology and in younger patients such as infants may be completely absent at presentation. Some pediatric patients may present with a history of appendicitis or acute loin pain when the actual cause of the patients symptoms is secondary to an acute pediatric scrotum itself.

The two most commonly used preoperative studies are testicular scan and color Doppler ultrasound. Testicular scans reliably show whether the testes have vascular flow or not, but are difficult to be obtained during the night. Doppler ultrasounds are operator dependant and when done by experienced physician, can help reduce the number of emergency operations and hospitalization days.

Normally, testis is partially covered by tunica vaginalis derivated from procesus vaginalis in anterior part. If testis, epididymis and distal part of

spermatic cord is covered by tunica-vaginalis, torsion of the testis may happen in this serosal space<sup>4</sup>. The main differential diagnoses are acute epididymitis, strangulated hernia, hematocle, hydrocele, testis tumor and idiopathic scrotal edema<sup>5</sup>. Clinical judgment by the surgeon is probably the most important factor in assessing testicular salvage. In the face of doubt the next step in management is immediate surgical scrotal exploration. Definite diagnosis of testicular torsion mostly can be confirmed by prompt scrotal exploration. Prognosis is good when detorsion of the affected testis is performed within first 6 hours<sup>1-6</sup>.

We retrospectively reviewed of all recorded cases of acute scrotal pain in patients aged 12 years or below admitted at pediatric surgery department of SKN medical college hospital, Pune between January 2009 and October 2017. Data included history, age, primary symptoms, definite diagnosis, side involvement, paraclinical tests, imaging modalities, medical or surgical management and type of the surgery.

### Methods

This cross sectional descriptive study based on records was conducted on patients with acute scrotal pain or swelling referred and admitted to pediatric surgery unit of department of surgery of SKN medical college hospital, Pune between January 2009 and October 2017.

**Inclusion Criteria-** All pediatric patients of age group 12 year or below with acute scrotal pain admitted at pediatric surgery ward

**Exclusion Criteria-** None

A total of 150 patients were evaluated in this study, and data was collected from the medical records of patients in the archives and following details were noted - age, primary symptoms, definite diagnosis, side involvement, surgical treatment, non - surgical management, clinical presentation, time of hospital admission, orchiectomy, contralateral testis fixation, urine analysis and other diagnostic tools.

## Results

One hundred and fifty patients, aged one day to 12 years (mean 6.5 years) were studied. Most (34%) of the patients were in the first year of life (Table 1). The commonest signs were pain and swelling (66%), pain, swelling and redness (18%) and pain alone (14%); fever was the less common (2%) symptom in our patients (Table 2).

Acute scrotum was found 49% in left side, 45% in right side, and only 6% bilateral caused by epididymo–orchitis

Surgical exploration was performed in 118 (79%) patients, and only 32(21%) patients (25 cases with torsion of testicular appendage, one case of epididymo orchitis and 6 cases due to idiopathic scrotal edema) underwent non–surgical management. Etiology of acute scrotal condition is shown in Table 3.

The diagnoses of 118 patients treated surgically were as follow: torsion of testis 46, incarcerated inguinal hernia 45, torsion of testicular appendage 15, epididymo–orchitis 9, 2 had hematocele and one with haematocele.

In 20 out of 46 patients with testicular torsion orchiectomy and contralateral orchiopexy was performed. In these 20 patients three were referred within the duration time of 6 hours and others after 48 hours of onset.

In 15 out of 40 patients with torsion of testicular appendage surgical intervention was performed and appendectomy + ipsilateral orchiopexy carried out. 25 patients were managed conservatively. Only 18(12%) out of our 150 patients had preoperative ultrasonography and in 5 cases due to inflammation and heterogenic tissues were suspected to have testicular torsion which was confirmed by surgical exploration.

In 76 patients urine analysis and urine culture were performed, 7 patients (4 with testicular torsion and 3 patients with torsion of testicular appendage) had leucocyturia. In all patients with epididymo-orchitis this test was normal.

Ninty patients (60%) with acute scrotum were referred to our hospital within the first 24 hours, 80% of which were treated surgically over 12

hours, and all of them had pain and swelling. Etiology of acute scrotum is shown in Table 3.

**Table 1** Age wise distribution of patients with acute scrotum

Age	No Of patients	Percent
0-1	54	36%
1-5	45	30%
5-10	36	24%
>10	15	10%
Total	150	100%

**Table 2** Presenting symptoms

Presenting symptom	No of patients	Percent
Pain and swelling	99	66%
Pain+swelling+redness	27	18%
Pain	21	14%
Fever	3	2%
Total	150	100%

**Table 3** Etiology of acute scrotum

Etiology	No of patients	Percentage
Torsion of testis	46	30.6%
Incarcerated inguinal hernia	45	30%
Torsion of testicular appendage	40	26.6%
Epididymo-orchitis	10	6.6%
Idiopathic scrotal edema	6	4%
Hematocele	2	1.3%
Pyocele	1	0.6%
Total	150	100%

## Discussion

The most common symptom in our series was pain and swelling (65%), whereas in the series of Granados et al with 33 patients, pain alone was the predominating symptom<sup>6</sup>. Urinalysis was mostly normal in our patients, and diagnosis generally was established by clinical symptoms and careful physical examination. Patients usually presented with scrotal pain. The duration of symptoms was shorter in testicular torsion (69% present within 12 hours) compared to torsion of the appendix testis (62%) and acute epididymitis (31%)<sup>[7]</sup>. In the early phase, location of the pain can lead to the diagnosis. Patients with acute epididimitis experience a tender epididimis, while patients with testicular torsion are more likely to have a tender testicle and patients with torsion of the appendix testis feel isolated tenderness of the

superior pole of the testis<sup>7</sup>. In our study 90 (60%) patients with acute scrotum were referred to our hospital within the first 24 hours, 80% of which were treated surgically over 12 hours, and all of them had pain and swelling.

Sidler et al<sup>7</sup> in 1997 reported their series in which the most common (32%) etiology was testicular torsion, 70% in left testis, 31% torsion of testicular appendage and epididymo-orchitis in 28% of the patients. whereas in our series common etiology was torsion of testicle (31%), torsion of testicular appendage (27%), and epididymo-orchitis (7%).

In Sidler<sup>7</sup> series orchiectomy was performed in 61.2% within 24 to 48 hours of clinical onset, in our study it occurred in 10 (10%) patients within 12 to 24 hours and that was due to earlier diagnosis and surgical management.

Mean age of patients in Sidler's series for testicular torsion was 6.3 years and for torsion of testicular appendage it was 10 years, Most (36%) of the patients were in the first year of life and the mean age was 6.5 years.

When a child is referred for scrotal redness and swelling, early surgical intervention is mandatory. Even in cases of torsion of testicular appendage, surgical management is suggested, not to miss torsion of testis<sup>8</sup>. Sonography is the imaging modality of choice for the scrotum because it is simple, relatively inexpensive, and quick (Carkaci S, et al)<sup>9</sup>. Doppler ultrasound (DUS) is able to differentiate between surgical emergencies and other etiologies. Schalamon J et al reported 84% success in this differentiation<sup>10</sup>. Galejs et al<sup>11</sup> in 1998 suggested that Doppler sonography is very effective in torsion diagnosis; the accuracy being sometimes even 100%. Radio-isotop is a useful diagnostic tool for acute scrotum<sup>12-14</sup>. In our hospital, ultrasound with an expert sonologist, is only available during day time and not during the late afternoon and at night.

As pain and swelling of scrotum are the most common symptoms in testicular torsion and also there are paucity of diagnostic tools, so some studies suggest early surgical exploration<sup>15-17</sup>, as

we have done this for the indicated patients in our study.

### Conclusion

The testicular salvage rates in TT are 85–97% if operated within 6 hours of onset of symptoms. Pediatric patients with an acute scrotum have several different etiologies, symptoms and pathology. All patients must be evaluated urgently and surgeons should have a low threshold to organize an emergency testicular exploration when a TT is suspected

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