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Management of Acute Scrotum in a Child: Our Experience with Literature Review

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Abstract

Introduction: Acute scrotum is a surgical emergency in children. There are many differential diagnoses of which testicular torsion is the most critical. *Materials and Methods:* This is a prospective study of retrospective data of 20 boys below 12 years with acute scrotum. Data analysis was done with respect to age, duration of presentation, clinical signs and symptoms, blood count and urine analysis, Doppler USG, management and complications. *Results*: 4 patients underwent orchiectomy for nonviable testis following testicular torsion. Patients with epididymo-orchitis responded to management with intravenous antibiotics. *Conclusion*: Early referral and prompt diagnosis and intervention in patients with acute scrotum is necessary for testicular salvage.

Keywords: Acute Scrotum; Children; Testicular Torsion.

Introduction

Acute scrotal pain and swelling is a pediatric surgical emergency. Testicular torsion is the most important differential as the chances of testicular salvage are highest within the first 6 hours. The other differentials like post infective or post traumatic swellings respond to conservative management.

Material and Methods

A prospective study of retrospective data of 20 boys up to 12 years of age with acute scrotum was carried out in a tertiary care institute from January 2012 to June 2016. All patients with pain, swelling, erythema and discoloration of the scrotal skin were included in the study. Patients with evident varicocele or congenital hernia were excluded from the study. Retrospective data analysis was done with respect to age, duration of presentation, clinical signs and symptoms, Blood count, urine analysis, Doppler ultrasound, management and complications.

All patients were started on broad spectrum antibiotics. Blood and Urine analysis were requisitioned. Urgent ultrasound with Doppler was done in all cases. Patients with testicular torsion underwent urgent surgical exploration with detorsion .Orchidectomy was performed if the testis was not viable. The contralateral testis was fixed. Cases of epididymoorchitis and scrotal cellulitis were treated with systemic antibiotics and scrotal elevation. Scrotal haematoma secondary to trauma were closely monitored.

Observation and Results

In our series, the youngest patient was 5 months and the eldest patient was 11 years. Five patients were less than one year of age, six were between one and five years of age, nine were between 6 and 12 years of age. The youngest child presenting with torsion was 9 months of age and the eldest 11 years. All cases of testicular torsion were on the left side. Epididymoorchitis was common in the older age group.

No patient presented within 6 hours of the onset of symptoms. Most patients presented 24 to 48 hours after onset of symptoms. Patients of testicular torsion

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presented between 24 hours to 3 days. Due to the delayed presentation or referral, all patients had irreversible testicular changes and the testes could not be salvaged.

Swelling, pain and erythema were present in 18 cases. Vomiting and bluish discoloration of the scrotal skin was present in 2 patients with testicular torsion. Two patients with epididymo-orchitis had dysuria with fever.

Five patients (4 with torsion and one with trauma) had a leukocyte count within normal range. All patients of epididymo-orchitis, scrotal cellulitis and infected secondary hydrocele had an elevated leukocyte count upto 22,000 cells per ml.

On urine analysis, bacteruria and pyuria was present in six patients. Urine culture was positive in two patients. Both patients had an associated anorectal malformation. Ultrasound of kidneys and micturating cystourethrogram were normal in both.

All patients underwent ultrasonography with Doppler . No flow in the testicular vessels on Doppler sonography was seen in four patients suggestive of torsion. On scrotal exploration, the testis was nonviable in all four patients. Ipsilateral orchidectomy and contralateral orchiopexy was performed.

Twelve patients with epididymo-orchitis were managed with antibiotics. Two patients had scrotal haematoma following trauma. One patient with bilateral scrotal cellulitis and another with an infected secondary hydrocele responded to conservative management.

Discussion

Acute scrotum is a challenging situation in an emergency setting, as it includes multiple differential diagnoses. Prompt recognition with exclusion of other conditions and intervention is of paramount importance in testicular salvage [1].

The differential diagnosis of acute scrotum includes Testicular torsion, Torsion of testicular or epididymal appendage, Epididymitis, orchitis, epididymo-orchitis, Hydrocele, Testicular tumor rarely, Idiopathic scrotal edema, Idiopathic testicular infarction, Traumatic rupture, Traumatic hematoma [2].

Torsion of the epididymal appendage of the testis is commonly seen in boys aged 7-12 years, whereas testicular torsion is seen at its peak between 12 to 16 years and is seen predominantly on the left side [3]. Common predisposition being abnormal fixation of tunica vaginalis proximally on the cord, leading to excess mobility of the testis (bell clapper deformity), classically known as intravaginal torsion. Intravaginal torsion can occur at any age commonly after 10 [3]. The chances of testicular compromise increase progressively after 6 hours of the onset of pain; hence urgent surgical exploration is warranted in a case of testicular torsion [3].

Extravaginal torsion occurs in fetuses and in neonates where the testis, epididymis, and tunica vaginalis twist on the spermatic cord [4]. Neonatal torsions are grouped into prenatal torsions and postnatal torsions. Common predisposition of neonatal torsions are complicated pregnancies and vaginal deliveries. Prenatal torsions are never salvageable; therefore emergency surgical intervention is not required. Postnatal torsions are sometimes salvaged, and a judicious approach to surgical exploration should be taken [4].

In another study, the management of perinatal testicular torsion is controversial. Although the chances of salvaging the involved testis is very low, it is hard to justify a passive approach to the condition, which may lead to anorchia. One should explore the affected side promptly to confirm the diagnosis and to fix or remove the affected testicle. The contralateral scrotum also should be explored because of the risk of asynchronous contralateral testicular torsion [5].

In a study to assess clinical predictors of acute scrotum it was seen that pain of less than 24 hours duration, nausea or vomiting, high position of the testicle, and abnormal cremasteric reflex are associated with higher likelihood of torsion [6]. Usually, localized tenderness occurs, but only in the upper pole of the testis. In cases of torsion of epididymal appendage occasionally, present in light-skinned boys is the blue dot sign (i.e., a tender nodule with blue discoloration on the upper pole of the testis) [3]. Urinanalysis of patients of testicular torsion are

usually normal. The presence of white blood cells (WBCs) can be observed in as many as 30% of patients who have torsion [2].

The scrotal skin is thickened, edematous and inflamed in idiopathic scrotal cellulitis. The testis is not tender and is of normal size and position [2]. Testicular tumor produces scrotal enlargement, only rarely accompanied by pain [2]. The presentation is rarely acute. Trauma is one of the causes of acute scrotum presenting with haematocele, scrotal contusion or testis rupture [2].

Epididymitis, orchitis, and epididymo-orchitis are conditions that commonly occur from the reflux of infected urine or infections.. Fever, scrotal pain, oedema and erythema along with dysuria is seen commonly in cases of epididymo-orchitis [3]. Pyuria, bacteriuria, or leukocytosis is possible[3]. Pyuria is present in 20% to 40% of cases of epididymorchitis. Most of the cases are associated with ectopic ureter, urethral abnormalities, predisposing the patient to reflux of urine [3]. A complete urologic evaluation (i.e, renal sonography, micturating cystourethrogram) is necessary in prepubertal boys with acute epididymitis and positive urine culture [3]. The management goal is to relieve inflammation and any associated infection. In the presence of pyuria, broad spectrum antibiotics with gram negative coverage should be used. Efforts to reduce the inflammation include the use of ice packs, nonsteroidal anti-inflammatory agents, scrotal elevation, and rest to avoid traumatic exacerbation [3].

Epididymo-orchitis usually resolves without any sequelae. However complications which can occur are reactive hydrocele, abscess formation and testicular infarct. The relationship between epididymo-orchitis and infertility is poorly understood. Men who present with obstructive azoospermia are usually found to have epididymal obstruction when explored for sperm retrieval, which may be a consequence of previous infection. Mumps epididymo-orchitis can lead to testicular atrophy. Of those with bilateral orchitis, 13% will have reduced fertility [7].

High-frequency transducer Sonography combined with color flow Doppler sonography is the primary imaging modality in cases of acute scrotum, because of its ability to diagnose pathogenesis in patients with testicular torsion, epididymo-orchitis, and testicular trauma [8]. The findings specific to torsion on USG Doppler are absent or decreased blood flow in the affected testicle, decreased flow velocity in the intra testicular arteries and increased resistive indices in the intra testicular arteries. Hyper vascularity with a low resistance flow pattern is seen after partial torsion-detorsion [2]. According to Coley et al the sensitivity of color Doppler examination with newer ultrasonography equipment in detecting acute testicular torsion in children is 90-100% [9]. Other studies have suggested that color Doppler ultrasonography was only 86% sensitive, 100% specific, and 97% accurate in the diagnosis of torsion and ischemia in the painful scrotum [10].

Urgent Surgical exploration is warranted in cases when a technically adequate color Doppler ultrasonogram cannot be obtained, when blood flow to the testis is found to be diminished or absent or it is not possible to demonstrate a Doppler signal in the small testes of some young boys. In the latter situation, the clinical findings alone suffice as an indication of exploration to maximize testicular salvage. Prolonged symptoms increase the chances of testicular atrophy. Exploration is a safe and easy procedure using mid line scrotal incision with detorsion of the involved testis and its fixation. Orchidectomy is required in cases of testicular gangrene and/or necrosis. This is accompanied with the fixation of the opposite testis with non-absorbable sutures [11]. In Jefferson series, testicular salvage rate was found to be 61% with mean duration as 12 hours from the onset of symptoms to surgical exploration [12]. Testicular salvage is directly related to the duration of symptoms with only 20% salvage after 12 hours and virtually no salvage after 24 hours. Non-viable testes are removed to prevent immune-mediated injury to the opposite side testis [13].

Conclusion

Early referral and prompt diagnoses and intervention in patients with acute scrotum is necessary for testicular salvage.

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