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RESEARCH ARTICLE

ACUTE SCROTUM IN CHILDREN AND YOUNG ADULTS; CLINICAL PROFILE AND MANAGEMENT

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ABSTRACT

Testicular torsion is a surgical emergency. Early diagnosis and timely intervention salvages the testis. Methods; 50 patients of acute scrotum were admitted in general surgery department who were ≤25 years of age. After Detailed history, thorough examination, relevant investigations and Doppler ultrasound, patients were divided into two groups. Group A included patients who required immediate surgical intervention and Group B included patients who were managed conservatively. Type of surgical procedure, Postoperative period, hospital stay and follow up findings were noted. Results: Youngest patient was 10 months old and eldest was 24 years old. Most common presentation was scrotal pain seen in 49 patients followed by scrotal swelling in 48 patients. All patients underwent baseline investigations and Doppler untrasound scrotum. Group A pncluded 27 patients; 23 testicular torsion, epididymo-orchitis 1 patient, torsion of testicular appendage 1 patient, incarcerated inguinal hernia 1 patient and traumatic haematocele 1 patient. Average Hospital stay in this group was 4 days. On follow up at 3 weeks all patients were symptom free and wound was healthy. Group B included 20 patients of epididymo-orchitis, 2 patients of torsion of testicular appendage and one patient of idiopathic scrotal edema. They were provided rest, antibiotics, antnflamatory drugs and proteolytic enzymes. All patients in group B resolved by conservative management and were discharged at average of 3 days. At follow up all patients were settled and symptom free. Conclusion; Early diagnosis and timely intervention prevents gangrene and hence loss of testis.

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INTRODUCTION

Acute scrotum occurs with 1/20th frequency of the acute abdomen (Ashraf *et al*., 1993). However, acute scrotal swellings are not as rare as the reports usually imply. It has been suggested that the incidence in any busy hospital is about 2 or 4 patients each year (Barker and Raper, 1964; Angell, 1963; Klingermann and Nourse, 1967). The most common cause of acute scrotum in children <15 years of age by far is the torsion of testis and its appendages, the epididymo-orchitis being uncommon (Oldham, 1997). However in older children and young males 15 – 25 yrs, incidence of torsion of testis and its appendages is 56%, while that of Epididymo-orchitis is 43% (Liu *et al*., 2007). Testicular torsion occurs in any age group, however the mean age of onset is 14 yrs. There are two separate and distinct ages of maximum incidence: The first year of life and around puberty (Skoglund *et al*., 1970).

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MATERIAL AND METHODS

The study was a prospective study, carried over a period of 2 years in the Department of General Surgery. All patients of age group of ≤25 years with acute scrotum admitted from October 2009 to September 2011 were included in the study.

Detailed history and physical examination of the patients at the time of admission was performed and documented. Baseline investigations involving haemogram, urine routine examination, urine culture with sensitivity, serum electrolytes and kidney function tests were carried out in all patients. All patients were subjected to Doppler ultrasonography scrotum. Patients with equivocal Doppler ultrasonography and strong clinical suspicion of torsion were operated without any delay. The patients were categorized into two groups. Group A comprised the patients who were on the basis of history, physical examination, laboratory investigations and Doppler Ultrasonography needed immediate surgical exploration. Group B comprised the patients who on the basis of history, physical examination, laboratory investigations and Doppler Ultrasonography were managed conservatively.

The patients in group B were managed with antibiotics on the basis of culture and sensitivity tests of urine, anti-inflammatory drugs, rest, elevation of scrotum (scrotal support), proteolytic enzymes and follow up at weekly intervals for 1st two weeks and thereafter monthly for at least 3 months for any testicular atrophy.

Records of patients not responding to conservative treatment or any complication during the conservative treatment and the intervention done were made. The data was tabulated and was subjected to appropriate Statistical tests.

RESULTS

This study included 50 patients of acute scrotum with age ≤25 years, who presented in surgical department S.M.H.S hospital Srinagar Kashmir over a period of 2 years. The age distribution of patients is given in Table 1. Youngest was 10 months old and oldest 24 years old

All patients with acute scrotum were admitted and subjected to Doppler ultrasound scrotum and all other baseline investigations. Doppler ultrasound showed torsion of testis in 22 patients (44%), torsion of testicular appendages in 2 patients (4%), epididymo-orchitis in 20 patients (40%), idiopathic scrotal edema in 1 patient (2%), incarcerated inguinal hernia in 1 patient (2%), traumatic haematocele in 1 patient (2%), and in 3 patients (6%) diagnosis was equivocal. All 22 patients with testicular torsion on Doppler ultrasound were operated, which came to be torsion in 20 patients and epidymo-orchitis in 2 patients. 3 patients with equivocal diagnosis on Doppler ultrasound were having strong clinical suspicion of torsion testis and were operated which came to be torsion testis during surgery. Group A included 27 patients. The operative procedure done, operative findings and follow up findings in Group A is depicted in Table 2.

Table 1. Age distribution of the acute scrotum (n=50)

Diagnosis	0–5 yrs age	% age	5-10 yrs age	% Age	10-15 yrs age	% age	15-20 yrs age	% age	20-25 yrs age	% Age	Total cases
Torsion of testis	1	2	3	6	11	22	6	12	2	4	23
Epididymo-orchitis	Nil		1	2	5	10	10	20	5	10	21
Torsion of testicular appendages	Nil		2	4	1	2					3
Idiopathic scrotal edema	1	2									1
Incarcerated Inguinal hernia	1	2									1
Scrotal trauma (Hematocele)	Nil		1	2							1
Total	3		7		17		16		7		50

The clinical presentation was scrotal pain and swelling, nausea and vomiting, fever and urinary symptoms as shown below

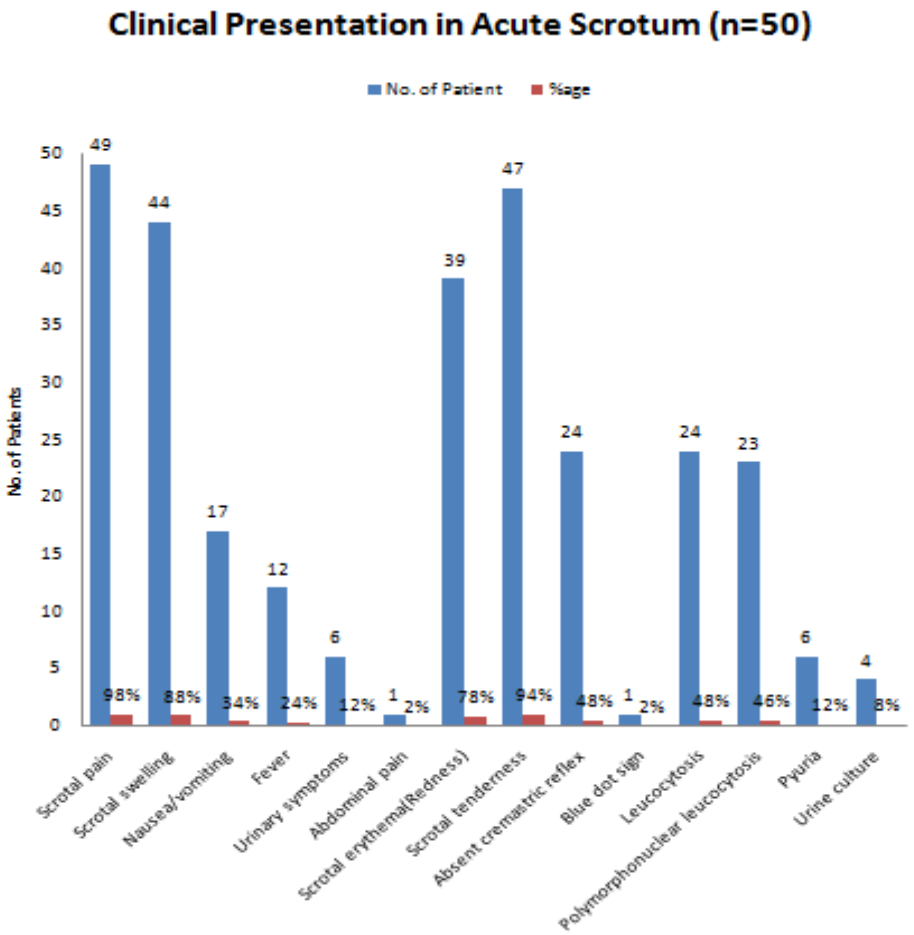

Table 2. Group A- Surgical procedures done in acute scrotum (n=27)

Diagnosis	Procedure done	Operative findings	No. of cases	%age	Follow up at 3weeks
Testicular torsion	Ipsilateral orchidectomy with contralateral prophylactic orchiopexy	Twisting of the cord with flabby, non-viable testis.	13	48.15%	Symptom free wound site healthy
	Surgical detorsion with ipsilateral orchiopexy and prophylactic contralateral orchiopexy.	Twisting of the cord with hyperaemia of testis	10	37.03%	Symptom free wound site healthy
Epididymo-orchitis	Eversion of tunica vaginalis after evacuation of reactionary fluid	Hyperaemic and edematous epididymis with small amount of reactionary fluid	1	3.7%	Symptom free wound site healthy
Torsion of testicular appendage	Exicision of appendix of epididymis	Gangrene of appendix of epididymis,with twisting of pedicle	1	3.7%	Symptom free wound site healthy
Incarcerated inguinal hernia	Hernial sac containing hyperaemic omentum	Herniotomy.	1	3.7%	Symptom free wound site healthy
Hematocele	Evacuation of hematoma with eversion of tunica- vaginalis	Large blood clot in tunica-vaginalis	1	3.7%	Symptom free wound site healthy

In postoperative period one patient developed scrotal haematoma, one wound sepsis and 3 patients developed scrotal edema. Average hospital stay in group A patients was 4 days and on follow up at 3 weeks all patients were symptom free and wound was healthy. Patients in group B included 20 patients of epididymo-orchitis, 2 patients of torsion of testicular appendage and one patient of idiopathic scrotal edema. They were provided rest, antibiotics, antnflamatory drugs and proteolytic enzymes. All patients in group B resolved by conservative management and were discharged at average of 3 days. At follow up all patients were settled and symptom free.

DISCUSSION

The youngest patient in this study was an infant of 10 months age and the oldest was 24 years. Predominant group in this study was 10-15 years comprising of 19 patients (38%). Total number of patients in the age group of 1 day to <25 years visiting ED/OPD from October 2009 to september 2011 were 45,260 while as the number of patients with acute scrotum in the age group of 1 day to <25 years were 50, so(1.1/1000) approximately one patient of acute scrotum visits the ED/OPD per thousand patients < 25yrs in the Department of Surgery in SMHS Hospital Srinagar. The most common clinical entity comprising the acute scrotum in children and young adults was found to be torsion of testis(46%), followed by epididymo-orchitis(42%), torsion of testicular appendages(6%), idiopathic scrotal edema(2%), incarcerated inguinal hernia(2%), and hematocele (2%). This is in close agreement with authors Liu *et al*. (1997) who revived 87 patients of < 25 yrs and reported that the torsion of testis constitute 47%, epididymo-orchitis 43.6%, and torsion of appendage of testis to be 9.2%.

Torsion of testis was found to be more common in the 10-15 year age group (22%) and less common upto 5 yrs of age (2%). Mean age for testicular torsion was 13.6 years. The epididymo-orchitis was found to be more common in 15-20 yrs of age (20%). Torsion of the appendages of testes was found to be most common in around 10 yrs of age in pre pubertal boys (three boys were 8,9 and 11 years old). These observations are in comparision with authors Lane *et al*. (2010) Jefferson *et al*. (2005)

The clinical picture revealed that scrotal pain was the most frequent presenting symptom of acute scrotum (98%). The pain was found to be the earliest symptom compelling the patients and their relatives to seek medical advice. The pain was localized to the involved hemiscrotum and was found to be associated with referred abdominal pain in only one patient (2%) of testicular torsion in our series. Swelling of the hemiscrotum on the involved side was present in 88% of the patients. Swelling was acute in onset, noticeable in first 4-6 hrs of the onset of pain in most patients. Tenderness of the involved hemiscrotum and testis was the most frequent clinical sign of acute scrotum (94%). Tenderness of the involved hemiscrotum was found in all patients of epididymo-orchitis, hematocele, incarcerated inguinal hernia. However scrotal tenderness was present in only 22 patients of testicular torsion, 2 patients of torsion of testicular appendages. In addition no tenderness was noted in a patient of idiopathic scrotal edema. Scrotal erythema was present in 39 patients(78%). Scrotal erythema was present in 17 patients of TT, 18 patients of EO, 2 patients of TTA, and in both patients of testicular trauma and idiopathic scrotal edema. Nausea/Vomiting was an associated complaint in 34% of patients. Fever was present in 24% - 12 patients of EO(57%), and urinary symptoms were present in only 12% of patients – 6 patients of EO(28.57%). These observations are in close agreement with the findings of Cavusoglu *et al*. (2005) and Yagil *et al*. (Yagil *et al*., 2010; Lewis *et al*., 1995).

Routine haemogram revealed leucocytosis in 50% of all patients of acute scrotum- 11 patients of TT(47.8%), 12 patients of EO(57%), one patient of TTA(33%), and one patient of idiopathic scrotal edema. polymorphonuclear leucocytosis was found in 48% of patients - 11 patients of TT(47.8%), 12 patients of EO(57%), and one patient of idiopathic scrotal edema. Pyuria was present in 12% of patients – 6 patients of EO (28.57%). These findings are in close agreement with the observations of Liu *et al*.

Doppler ultrasonography of scrotum was done in all 50 patients. DUS showed torsion of testis in 22 patients Preoperative Doppler ultrasonography showed torsion of spermatic cord in 22 patients. On Scrotal exploration, torsion of spermatic cord was confirmed in 20 patients, one patient

had torsion of appendix of testis and the other had Epididymo-orchitis. Three patients with equivocal Doppler findings, but strong clinical suspicion of testicular torsion were explored, and testis was found to be torsed in all the three patients. In all these three cases spermatic cord was found to have a partial twist (180^0). Thus the sensitivity and specificity of Doppler ultrasonography for testicular torsion was 86.9% and 92.6% respectively. This is in close agreement with the observations of Liu *et al*.

Preoperative Doppler ultrasonography showed Epididymo-orchitis in 20 patients, torsion of testicular appendage in 2 patients, Idiopathic scrotal edema in one, Incarcerated inguinal hernia in one, and a large hematocele in one patient. All twenty patients of epididymo-orchitis, two patients of torsion of testicular appendage,and one patient of idiopathic scrotal edema were managed conservatively.

At three weeks follow up, all the patients were free of symptoms. One patient of scrotal trauma with Doppler showing a large hematocele, and the other one with obstructed inguinal hernia were explored and Doppler findings were confirmed. The sensitivity and specificity of Doppler ultrasonography for epididymo-orchitis was 95% and 100% respectively. Thus 23 patients were managed conservatively and were saved from unnecessary surgical exploration.

For management purposes patients were divided into two groups: Group A (operated cases) and Group B (conservative). In the operated group of patients (n=27), 23 patients were found to have torsion of testis(Doppler ultrasound showed testicular torsion in only 20 of them). Viable testes were found in 10 of 23 patients with testicular torsion during operation. All these patients presented with in 6hrs of onset of symptoms. Detorsion of the affected testis with fixation (orchiopexy) of the ipsilateral and contralateral testes were performed. The other 13 patients presented >12 hrs of onset of symptoms. On exploration, testes were found to be nonviable. Ipsilateral orchidectomy with prophylactic orchiopexy for unaffected testis was done to prevent further TT. The salvage rate of TT was 43.47% (10/23 cases). In our study, although the pain of TT appeared more abruptly, the situation of delayed presentation was significant (56.5%, > 12 hours), leading to testicular necrosis and gangrene, and low salvage rate. This is in close agreement with the observations of Liu CC etal, where they reported the salvage rate of TT to be 41.5%, owing to delayed presentation in most cases. Lewis *et al*. (1995) reported that the testicular salvage was critically dependent on the time interval between the onset of pain and the surgical intervention. Misdiagnosis and delayed presentation are thought to be the major causes of low testicular salvage rates.

There were three cases with TT who did not show obvious decrease in blood flow during color Doppler ultrasonographic evaluation in the emergency department. Because TT was highly suspected due to severe testicular pain, and loss of cremastric reflex, surgical exploration was still performed and TT of about 180° was found. Fortunately, viable testes were noted following detorsion and fixation was performed on both sides in all three cases. Liu *et al*.* also reported a similar findings in one of their patients.

One patient in the operated group (with pre - operative doppler ultrasound showing testicular torsion - false positive) was found to have torsion and gangrene of appendix of epididymis. Excision of the appendix of epididymis was performed. One patient in the operated group (with pre - operative doppler ultrasound showing testicular torsion - false positive) was found to have epididymo - orchitis. Eversion of tunica vaginalis after evacuation of reactionary fluid was done. One patient in the operated group (with pre - operative doppler ultrasound showing inguinal hernia) was found to have Incarcerated inguinal hernia with healthy testis. Herniotomy was performed in this patient. One patient in the operated group with testicular trauma (with pre – operative Doppler ultrasound showing large hematocele) underwent evacuation of the hematocele. Testis was found to be healthy and was preserved.

Conservative management was undertaken in 23 patients. This group comprised 20 patients with epididymo-orchitis, 2 patients with torsion of testicular appendages, and one patient of idiopathic scrotal edema. All 20 patients of epididymo-orchitis and 2 patients of torsion of testicular appendages were managed conservatively with rest, scrotal support, NSAIDS, and antibiotics. One patient of idiopathic scrotal edema was managed with rest, support, NSAIDS and antihistaminics. Mean hospital stay in the operated group of patients was 5+1 days for cases with testicular torsion, 4 days for TTA, 3 days for incarcerated inguinal hernia, and 3 days for testicular hematocele. Mean hospital stay in the conservative group was 5 days for epididymo- orchitis, 4+1 days for TTA, and 2 days for idiopathic scrotal edema. This is in agreement with most of the authors and we believe that it is representative of the experience of most of the hospitals.

Follow up of the patients was carried out at one week and 3 week intervals. All patients in the operated group were symptom free at one and three week follow up visits. In all the patients who had undergone prophylactic orchiopexy, testes were of normal size and non-tender. In the conservative group of patients, all the patients were healthy and symptom free at one and three week follow up visits. Tenderness was not present in any patient. We believe that follow up of patients with acute scrotum should be undertaken for every patient for at least one month after discharge from hospital, as has been pointed out by most authors.

Conclusion

Acute scrotum is not so uncommon urological emergency. Strong clinical vigilance and timely intervention when required salvages the testis.

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