

A prospective study of clinical profile and management of acute scrotum in different age groups

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Abstract

Introduction: Acute scrotum is a clinical syndrome which includes any condition of scrotum or scrotal contents requiring emergency medical or surgical intervention, because acute scrotal pathology can result in testicular infarction and necrosis, testicular atrophy, infertility, persistent testicular pain and significant morbidity. This study aims to know different causes and clinical features of acute scrotum and its management. **Methods:** The study was prospective study conducted at RCSM GMC, Kolhapur. A total of 70 patients who presented with acute scrotal pain from 8 August 2013 – 28 February 2015 were recruited for the study. **Results:** The mean age of patients in the study 37.28 years. Of the 70 patients included, 17 (24.28%) had torsion testis (TT), 4 (5.71%) had torsion of appendix of testis (T Ta), 26 (37.14%) had Epididymitis and epididymo-orchitis (E/EO), 15 (21.42%) had Fournier's gangrene (FG), 4 (5.71%) had scrotal abscess (Sab), 3 (4.28%) had scrotal hematoma (SH) and 1(1.42%) patient had obstructed inguinal hernia (OH). Most common cause of acute scrotum is epididymo-orchitis and epididymitis followed by testicular torsion, Fournier's gangrene, torsion of appendix testis, scrotal abscess, scrotal hematoma and rare causes such as obstructed inguinal hernia. In case of torsion testis, surgical exploration undertaken without delay increases the chance of testicular salvage. Epididymitis and epididymo-orchitis is most common cause of acute scrotum in young adults and middle aged men. Fournier's gangrene as a cause of acute scrotum is most common in old age group and diabetes mellitus is a major risk factor for this etiology. **Conclusions:** Acute scrotum is a common surgical emergency. Ultra sonography and colour Doppler ultrasound are imaging modality of choice in acute scrotum. In case of torsion testis, the 6 hour time limit is not fixed and even in late presentations up to 12 hours, the testicle may be salvageable if emergent scrotal exploration done. Most common pathogen causing epididymo orchitis in young adults is C. trachomatis. Epididymo-orchitis is rare in children and most common pathogen causing it in children and older age group is E. coli. Immediate surgical debridement, better facilities of hospital care, better antibiotics and supportive care decreases mortality in Fournier's gangrene cases.

Keywords: Acute scrotum, Torsion testis, Epididymitis, Epididymo-orchitis, Fournier's gangrene.

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INTRODUCTION

Term acute scrotum refers to acute scrotal pain with or without swelling and erythema. Acute scrotum is most common urological emergency, it accounts for 0.5% of total emergency department visits.^{1,2} Acute scrotum is a clinical syndrome which includes any condition of scrotum or scrotal contents requiring emergency medical or surgical intervention, because acute scrotal pathology can result in testicular infarction and necrosis, testicular atrophy, infertility, persistent testicular pain and significant morbidity. It poses one of the most

challenging clinical dilemmas in the field of surgery. Distinguishing conditions requiring emergency surgical intervention from the conditions which can be managed conservatively is the key in management of patients with acute scrotum.³ The correct diagnosis of the acute scrotum is not always obvious, but a thorough history, physical examination, use of basic laboratory studies with imaging modalities like colour doppler can aid in distinguishing conditions requiring emergency surgical intervention from others⁴. However, patients may present with atypical history and symptoms. Clinical symptoms and physical examination are often not enough for definitive diagnosis due to pain and swelling that limits an accurate palpation of the scrotal contents. Similarities in presentation and physical findings of different causes limit the accurate diagnosis. Radiological techniques are helpful but may delay diagnosis. Surgical intervention may be needed for both diagnostic and treatment purposes. This study aims to know different causes and clinical features of acute scrotum and its management.

MATERIALS AND METHODS

The study was prospective study conducted at RSCM GMC, Kolhapur. A total of 70 patients who presented with acute scrotal pain from 8 August 2013 – 28 February 2015 were recruited for the study.

Patients are divided into 4 age groups:

1. Prepubertal age group - Children <13 years of age.
2. Post pubertal age group - 13 years to 20 years of age.
3. Young adults age group - >20 years to 40 years of age.
4. Old age group - >40 years of age.

Detailed clinical examination was done. Laboratory investigations included routine blood investigations and urine analysis. Ultrasound and colour Doppler was done for all patients. Depending upon individual presentation of signs and symptoms and ultrasound, color Doppler results diagnosis confirmed and accordingly treatment given to each case. Patients with TT, FG and scrotal trauma were treated surgically immediately, scrotal exploration and debridement done respectively. Patients with E/EO treated conservatively with broad spectrum antibiotics initially and then after with specific antibiotics according to urine culture reports. All patients were followed up in outpatient department for 2 months and findings noted in terms of pain, suture line and scar status.

RESULTS

A total of 70 patients who presented with acute pain in scrotum were included in the study, the mean age of

patients in the study 37.28 years. The youngest patient was 10 months old and oldest was 77 years old. The median age was 35 years. Most patients were from the old age group i.e. 32 patients (45.71%). Out of 70 cases of Acute scrotum maximum cases were of E/EO i.e. 26(37.14%), 17 patients (24.28) had TT, 15 patients (21.42%) had FG, 4 patients (5.71%) of each TTa and Sab, 3 patients (4.28%) of SH and 1 patients (1.42%) had OH. [Table1]

Table 1: Etiology of Acute Scrotum

| Cause of Acute Scrotum | No. of Cases | % |
|------------------------|--------------|-------|
| TTa | 4 | 5.71 |
| TT | 17 | 24.28 |
| E/EO | 26 | 37.14 |
| FG | 15 | 21.42 |
| Sab | 4 | 5.71 |
| SH | 3 | 4.28 |
| OH | 1 | 1.42 |

torsion testis (TT), torsion of appendix of testis (TTa), Epididymitis and epididymo-orchitis (E/EO), Fournier's gangrene (FG), scrotal abscess (Sab), scrotal hematoma (SH) and obstructed inguinal hernia (OH).

Prepubertal Age Group

Most common cause of acute scrotum among prepubertal age group in this study is TT 8 out of 13 patients (61.54%), 4 patients (30.77%) had TTa and 1 patient (7.69%) had E/EO.

Post Pubertal Age Group

In post pubertal age group out of 7 cases 4 (51.14%) had TT and 3 (42.86%) had E/EO.

Young Adults Age Group

Of the 18 patients of acute scrotum in young adults age group 10 (55.56%) had E/EO, 3(16.67%) had TT, 2(11.11%) each had Sab and SH and 1 (5.56%) had OH.

Old Age Group

In old age group out of 32 patients of acute scrotum 15 (46.88%) had FG, 12 (37.5%) had E/EO, 2 (2.65%) each had TT and Sab and 1 (3.13%) had SH.[Table2]. All patients in the study had scrotal pain (100%). In the study a total of 60 patients. (85.71%) had scrotal swelling. 3 out of 4 patients of TTa (75%) and 17 out of 26 (65.38%) patients with E/EO had scrotal swelling. In the study 60 (88.57%) patients of acute scrotum had scrotal skin discolouration of which 46 patients had reddish discolouration (Erythema) and 14 patients had black discolouration.

Table 2: Causes of Acute scrotum in different age groups

| Diagnosis | ⇔ TTa | TT | E/EO | FG | Sab | SH | OH |
|---------------|-------|----|------|----|-----|----|----|
| Age Groups | ⇓ | | | | | | |
| Prepubertal | 4 | 8 | 1 | 0 | 0 | 0 | 0 |
| Post pubertal | 0 | 4 | 3 | 0 | 0 | 0 | 0 |
| Young adults | 0 | 3 | 10 | 0 | 2 | 2 | 1 |

old age group 0 2 12 15 2 1 0

torsion testis (TT), torsion of appendix of testis (TTa), Epididymitis and epididymo-orchitis (E/EO), Fournier's gangrene (FG), scrotal abscess (Sab), scrotal hematoma (SH) and obstructed inguinal hernia (OH). Of 26 cases of E/EO in the study 1 is in prepubertal age group with no organism growth on urine culture. In Post pubertal age group out of 3 cases 2 had E. Coli and 1 patient had no organisms grown on urine culture. In young adults age group out of 10 cases of E/EO, 8 had CT infection, 1 had EC and 1 no urinary organism. In old age group of 12 cases, 11 had EC urinary infection and 1 had CT urinary infection. All 15 cases of Fournier's gangrene in this study were mostly polymicrobial and E.coli in 7 (46.66%) patients and 4 (26.66%) respectively. SA and streptococcus isolated from 2 (13.33%) cases each. Of 15 cases of Fournier's gangrene in the study, 10 (66.66%) had DM, 7 (46.66%) had hypertension and 1 (6.66%) had paraplegia. Of 17 cases of TT in our study 4(23.52%) had undergone Orchidectomy. Overall testicular salvage rate in our study in 76.48%. Of these 17 cases 9 cases presented to hospital and underwent surgery within 6 hours of onset of pain and in these entire 9 cases testis were viable and salvaged with salvage rate of 100%, bilateral orchidopexy was performed in these cases. 6 patients presented to the hospital and undergone surgery between 6 to 12 hours of onset of symptoms, of these 2 had nonviable testes, so Orchidectomy with contra lateral orchidopexy was performed, with testicular salvage rate 66.66%. In remaining 4 patients bilateral orchidopexy was done. 2 patients of TT presented to hospital and underwent surgery after 12 hours of onset of symptoms and both these patients had non-viable testes, so both underwent Orchidectomy with contra lateral orchidopexy. In this group testicular salvage could not be achieved. [Table3]

Table 3: Duration between onset of pain and surgery and Testicular salvage rate in cases of TT in our study

| Time interval onset surgery | No. of patients | Orchidectomy | Testicular salvage rate |
|-----------------------------|-----------------|--------------|-------------------------|
| < 6 hours | 9 | 0 | 100 % |
| 6 - 12 hours | 6 | 2 | 66.67% |
| >12 hours | 2 | 2 | 0% |
| Total | 17 | 4 | 76.48% |

Of 17 cases of TT 10 cases (58.8%) had left testicular torsion and 7(41.2%) had right testicular torsion. Of 44 operated cases 11(25%) cases had postoperative complications in from of suture line infection and wound gaping

DISCUSSION

In current study maximum number of acute scrotum cases were in old age group 32 (45.71%) in young adults age

group 18 (25.72%) prepubertal age group 13 (18.57%) and post pubertal age group 7 (10%). These findings differs from study by Tajchner *et al*⁵ in which maximum number of acute scrotum cases were in prepubertal age group (39.49%), post pubertal age group (36%) Adult age group (23.6%). This variation in age distribution in these studies may be due to ethnic and regional difference as well as exclusion of some causes of acute scrotum like Fournier's gangrene in other study. In present study, Epididymo - orchitis was the commonest cause of acute scrotum in 37.14% of patients, Torsion testis is 2nd most common in 24.28% of patients, Followed by Fournier's gangrene (21.42%), Torsion of appendages of testis (5.71%), Scrotal abscess (5.71%) scrotal hematoma (4.28%) and obstructed inguinal hernia (1.42%) were other causes. Volkan Sarper ERIKCI *et al*⁶ study shows similar result with Epididymo-orchitis (44%) being most common cause of acute scrotum, strangulated inguinal hernia (32%), Testicular torsion (22%) and torsion of testicular appendage (2%). Tabari *et al*⁷ study had testicular torsion (31%) as most common cause of acute scrotum followed by incarcerated inguinal hernia (30%), torsion of testicular appendage (27%) Epididymo-orchitis (7%), Idiopathic scrotal edema (4%), scrotal hematoma (1%). Anderson *et al* [8] found testicular torsion (45%) as most common cause of acute scrotum in their study, Torsion of appendix testis (35%), Epididymo-orchitis (15%), Idiopathic scrotal edema (3%). Hence current study co-relates with some of the previous studies about incidence of etiological factors with epididymo-orchitis is being commonest cause while some studies differ on this point. This may be because of regional differences or due to exclusion of some causes in study design by some authors.

Prepubertal Age Group

In this study in prepubertal age group most common cause of acute scrotum is torsion testis 8 out of 13 cases (61.54%), There were 4 (30.77%) cases of torsion of appendix of testis and 1 (7.69%) case of epididymo-orchitis. In a study by Tajchner *et al*⁵, the most common cause of acute scrotum was torsion of cyst of morgagni (testicular appendage) (63%); torsion testis (25%), Epididymo-orchitis (3%)

Post Pubertal Age Group

In present study common causes of acute scrotum was; torsion testis (57.14%) and Epididymo-orchitis (42.86%). In study by Tajchner *et al*⁵ common causes of acute scrotum in this group were, torsion testis (46.8%) torsion of cyst of morgagni (44.6%) and epididymo-orchitis (2.12%)

Young Adults Age Group

In present study common causes of acute scrotum in this age group were, Epididymo-orchitis (55.56%), torsion

testis (16.67%) scrotal abscess (11.11%), scrotal hematoma (11.11%) and obstructed inguinal hernia (5.56%) In study by Tajchner *et al*⁵ common causes of acute scrotum in this age group were, torsion of appendix of testis (50%) torsion testis (28.6%), Epididymo-orchitis (3.57%) and scrotal hematoma (3.57%)

Old age group

In present study, common causes of acute scrotum in this age group were, Fournier's gangrene (46.88%) Epididymo-orchitis (37.5%), Torsion testis (6.25%), scrotal abscess (6.25%) and scrotal hematoma (3.13%). Hence current study co-relates with study by Tajchner about causes of acute scrotum in post pubertal age group but differ among other age groups. The reason for this difference could be due to regional, environmental and ethnic causes. Pain in scrotum, scrotal swelling, erythema, blackening of scrotal skin, fever and vomiting are common clinical features of acute scrotum. Present study results are comparable with study by Tabari *et al*⁷ to some extent. Scrotal pain present in all 70 patients, this pain is of acute onset. Scrotal swelling (100%) was mainly feature of TT, FG, Sab, SH and OH. 75% patients with TTa and 65.38 patients with EO had scrotal swelling. Erythema of scrotal skin was mainly present in TT (100%), EO (61.53%), Sab (75%) and SH (100%) while black discoloration of scrotal skin was a feature of FG (80%). Fever in patients of acute scrotum was present mainly in cases of FG (93.33%), Sab (75%) and TT (29.41%). Vomiting was observed in TT (47%), TTa (50%) and OH (100). In present study patients with EO in young adults age group had Chlamydia trachomatis (80%) as predominant micro-organism on urine culture. In post pubertal (66.66%) and old age group (91.66%) predominant micro-organism on urine culture is E.coli. These findings are consistent with previous such studies done by Manavi K. *et al*⁹ and redfern TR *et al*¹⁰. Most commonly associated condition with Fournier's gangrene was diabetes mellitus in present study and study by Tang *et al*¹¹⁻¹³. In present study, testis salvage rate when patient presented within 6 hours of onset of symptoms is 100% ; 6-12 hours of onset 66.67% and after 12 hours of onset of symptoms 0%. Overall testis salvage rate in present study was 76.48%, it is more than other studies may be due to early presentation of patients to us. In a study by Moslemi *et al*¹⁴ it was 57.5%; and Khaleghnezhad Tabari *et al*⁷ study 68%; Mahdavi *et al*¹⁵ had 70.5% Testicular salvage rate. In present study testicular torsion on left side was in 58.8% cases and 41.2% on right side; these results were comparable with previous study by Moslemi *et al*¹⁴.

CONCLUSIONS

Every case of acute scrotum should be evaluated immediately. Scrotal pain of acute onset, scrotal swelling,

scrotal skin discolouration, vomiting and fever are common modes of presentation of acute scrotum. In case of torsion testis, frequency of testicular infarction is directly proportional to the length of time the torsion is present and surgical exploration undertaken without delay increases the chance of testicular salvage. The 6 hour time limit is not fixed and even in late presentations up to 12 hours, the testicle may be salvageable if emergent scrotal exploration done. Most common pathogen causing epididymo-orchitis in young adults is C. trachomatis. Epididymo-orchitis is rare in children and most common pathogen causing it in children and older age group is E. coli. Fournier's gangrene as a cause of acute scrotum is most common in old age group and diabetes mellitus is a major risk factor for this etiology. Immediate surgical debridement, better facilities of hospital care, better antibiotics and supportive care decreases mortality in Fournier's gangrene cases. Delay in presentation and delay in referral from primary health centers and general practitioners adversely affects the morbidity and viability of testis in cases of torsion testis.

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