
Research Article,

“Study of Etiology of Acute Scrotum and Its Management”

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Abstract:

Introduction: Acute Scrotum is an emergency with vast number of differential diagnoses. Among these; testicular torsion and epididymo-orchitis are most common with potential to have short and long term complications. Low salvage rates are often secondary to misdiagnosis and delayed presentation. Late presentation remains the greatest cause of orchiectomy. Many studies had been conducted, on whether every patient of acute scrotum should be explored or not on solely clinical grounds. So whether to explore every patient of acute scrotum or not is no longer a question of debate.

Aim and objectives: The purpose of this study was to study the etiology, age incidence, the differential diagnosis and complications, of patients presenting with acute scrotum in emergency department at a government hospital.

Material and methods: This prospective observational study was carried out at a tertiary care centre from August 2015 to November 2017. In this study, 102 patients were included who were diagnosed and admitted for acute scrotum. A proforma was used to collect the details.

Observation and results: Out of 102 patients with acute scrotum, we had 74 (72.54%) patients with epididymitis and/or orchitis, 6 (5.88%) patients with testicular torsion, 20 (18.6%) patients with pyocele. In final diagnosis, we got 20 patients of pyocele but only 17 patients were diagnosed clinically, while 3 patients were earlier diagnosed as epididymo-orchitis. Out of 20 patients of pyocele, only 9 patients were confirmed on ultrasonography. Out of 6 patients of testicular torsion, in 3 patients we were able to save testis and bilateral orchiopexy was done. In 3 patients, simultaneous orchiectomy and contralateral orchiopexy were done. Out of 20 patients of pyocele, 3 patients were complication of epididymo-orchitis and 2 of testicular torsion. In 8 patients, we found gangrenous testis, hence, orchiectomy was performed. In 12 patients of pyocele, only incision and drainage was adequate.

Conclusion: Overlap exists between testicular torsion and other conditions of acute scrotum which present mainly in the younger population. The clinical manifestations, physical examination findings, and laboratory test results are helpful in distinguishing the etiology; however, ultrasonography and color Doppler prove to be of utmost help in the diagnosis and immediate treatment for testicular torsion. Conservative treatment given in the form of rest, scrotal support, antibiotics and analgesics for epididymo-orchitis and hematoma showed a favorable response while emergency surgical exploration undertaken without delay maximizes chances of testicular salvage in testicular torsion and pyocele.

Key words: acute, scrotum, testicular, torsion, epididymitis, varicocele

Introduction:

Acute Scrotum is an emergency wherein there is an acute painful swelling of the scrotum or its contents, accompanied by local signs and general symptoms.[1] It includes vast number of differential diagnosis, torsion of the testis, appendiceal torsion, testicular infarction due to other vascular insult, testicular rupture, intratesticular hematoma, testicular contusion, hematocele, infectious conditions like acute epididymitis, acute epididymo-orchitis, acute orchitis, insect bites, abscess, gangrenous infections (Fournier's gangrene), inflammatory conditions: Henoch-Schonlein Purpura (HSP) vasculitis of scrotal wall, incarcerated, strangulated inguinal hernia, with or without associated testicular, ischemia, acute on chronic events like spermatocele, hemorrhage or infection, testicular tumor with rupture, hemorrhage, varicocele.[2] Among these, testicular torsion and epididymo-orchitis are most common.[3] Patients with acute scrotal pain seen in the emergency department often present a diagnostic dilemma. Physical examination alone is not enough to differentiate between several of these etiologies. Differentiation between testicular torsion and other causes of pain is of critical importance because timely surgical exploration is indicated in cases of testicular torsion to preserve the affected testicle. Low salvage rates are often secondary to misdiagnosis and delayed presentation. Late presentation remains the greatest cause of orchietomy. Unfortunately, the clinical signs of acute epididymitis, torsion of appendix testis, and testicular torsion overlap and clinical differentiation are extremely difficult in many cases.[4] High Resolution Ultra-Sonography (HRUS) and Color Doppler Ultra-Sonography (CDUS) are excellent tools to differentiate surgical and non-surgical emergencies of scrotum.[5] This study was conducted to evaluate the differential diagnosis and outcome of operative and conservative management with its complication, of patients presenting with acute scrotum.

Material and methods:

This prospective observational study was carried out in an emergency department at a tertiary care center (Government Medical College, Aurangabad) in India from August 2015 to November 2017. All patients with complaints of acute scrotal pain, irrespective of age, were included in study. Patients with inguinal hernia,

Fournier's gangrene, refusing treatment or surgical management, were excluded. Institutional Ethics Committee permission was obtained prior to initiation of the study. Written informed consent was obtained from the patient or legally acceptable representative. Medical history was collected according to pre-structured proforma. Demographic data, clinical presentation, involved side, types of surgical procedure performed outcomes and complications were captured. Routine blood and urine investigations along with radiological investigations, ultrasonography and Doppler study of scrotum were performed.

Broad spectrum antibiotics and analgesics were started after final clinical and radiological diagnosis of epididymitis and/or orchitis. Scrotal support and magnesium sulfate dressing were given. In case of testicular torsion and pyocoele, surgical procedures were carried out urgently. Change in size, tenderness of scrotal swelling and further investigations done in non-operated cases and accordingly decision was taken for scrotal exploration. Operated cases were daily examined till discharge. Follow up was done in outpatient department for 3 months. Data from the proforma was transcribed in a Microsoft excel sheet and analyzed using SPSS version 21 software. Descriptive statistics were represented as frequencies and percentages for categorical variables. Association between the categorical variables was evaluated using Chi square test. The level of significance in the study was <0.05.

Observation and results:

During the study period, 102 patients were diagnosed for acute scrotum initially on clinical grounds and admitted in General surgery department. On final diagnosis, there were 74 (72.54%) cases of epididymitis and/or orchitis, 6 (5.88%) of testicular torsion, 20 (18.6%) of pyocoele and 2 (1.96%) due to other reasons including a hematoma and adverse drug reaction.

Table 1. Age wise distribution of different entities of acute scrotum.

Age groups	Epididymitis /Orchitis (n=74)	Testicular torsion (n=6)	Pyocoele (n=20)	Others (n=2)	Total
≤ 20 year	10(13.5%)	2 (33.3%)	1(5.0%)	0	13(12.74%)
21 - 30	13 (17.6%)	3 (50.0%)	2(10.0%)	0	18(17.65%)
31 - 40	16(21.6%)	0	3(15.0%)	0	19(18.62%)
41 - 50	14(18.9%)	1(16.7%)	4(20.0%)	1(50.0%)	20(19.61%)
51 - 60	14(18.9%)	0	4(20.0%)	1 (50.0%)	19(18.62%)
61 - 70	6 (8.1%)	0	2(10.0%)	0	08(7.84%)
>70 year	1(1.35%)	0	4(20.0%)	0	05(4.90%)

Epididymitis/orchitis was seen commonly in 21 to 60 years of age group with almost 60% of all cases, with mean age 39.96± 16.29 years. Testicular torsion was seen below 30 years (83.3%) with mean age 26.33± 11.20 years. Pyocoele was seen in most patients after 40 years of age (70%) with mean age 47.65± 15.3 years. (Table 1)

Table 2: Symptoms among various entities of acute scrotum.

	Epididymitis /Orchitis [n=74]	Testicular torsion [n=6]	Pyocoele [n=20]	Others [n=2]	Total [n=102]
Pain in scrotum	53 (71.6%)	5 (83.3%)	12 (60%)	1 (50.0%)	71 (69.6%)
Swelling of scrotum	52 (70.3%)	2 (33.3%)	19 (95%)	2 (100%)	75 (73.5%)
Pain in abdomen	9 (12.2%)	1 (16.7%)	4 (20%)	0	14 (13.7%)
Nausea/vomiting	3 (4.05%)	2 (33.3%)	0	0	5 (4.9%)
Burning micturition	3 (4.05%)	0	1 (5%)	0	4 (3.9%)
Hematuria	0	0	1 (5%)	0	1 (0.98%)
Fever	17 (22.9%)	0	9 (45%)	0	26 (25.5%)

Epididymitis/orchitis cases presented with variable symptoms as pain in scrotum, swelling of scrotum

or both or with only abdominal pain and few with nausea/vomiting, burning micturition and fever. Fever and burning micturition were observed in infective conditions (epididymitis/orchitis and pyocoele); whereas fever and burning micturition was absent in testicular torsion and other non-infective conditions like hematoma and others. (Table 2)

Table 3: Signs among various entities under acute scrotum.

Signs	Epididymitis /Orchitis	Testicular torsion	Pyocoele	Others
Swelling	40 (54.1%)	2 (33.3%)	20 (100%)	1 (50%)
Erythema	28 (37.8%)	1 (16.7%)	13 (65%)	0
Raised temperature	45 (60.8%)	0	15 (75%)	0
Tenderness	62 (83.8%)	6 (100%)	20 (100%)	2 (100%)

In infective conditions, erythema and raised temperature were commonly found; whereas erythema was seen in only 1 case of testicular torsion. Tenderness was found as universal feature of pyocoele, testicular torsion and others but in epididymitis/orchitis it was present in 62 (83.8%) cases. (Table 3)

Leukocytosis was found in 16 (27.1%) cases out of 59 investigated cases of epididymitis/orchitis. In pyocoele it was found in 9 (52.9%) cases out of 17 investigated cases. Leukocytosis was not found in testicular torsion and others.

Positive urine analysis was found in 9 (26.5%) cases out of 34 investigated cases of epididymitis/orchitis and 1 (33.3%) case out of 3 cases of testicular torsion. In pyocoele it was found in 2 (22.2%) cases out of 9 investigated cases. Urine analysis was negative in others.

Table 4: Diagnosis of patients presenting as acute scrotum

No. of cases	Epididymitis /Orchitis	Testicular torsion	Pyocoele	Others	Total
Clinical diagnosis	77	6	17	2	102
Radiological diagnosis	63	5	9	1	78
Final diagnosis	74	6	20	2	102

Initially, 77 cases of epididymo-orchitis were diagnosed on clinical basis but with due course of time, 3 cases progressed to pyocoele and successively explored. Out of 6 cases of testicular torsion, only 1 case presented with short duration of time that is 90 minute so he was taken directly to surgery without doing radiological investigations but was proven to be testicular torsion intra-operatively, and testis was salvaged. In final diagnosis, we got 20 cases of pyocoele but only 17 cases were diagnosed clinically, rest 3 cases were earlier diagnosed as epididymo-orchitis. Out of 20 cases of pyocoele, only 9 cases were confirmed on ultrasonography. (Table 4)

Table 5: Surgical procedures required

Surgical procedure	Epididymitis / Orchitis	Testicular torsion	Pyocoele	Others
Scrotal exploration	2 (2.7%)	0	0	0
Bilateral Orchidopexy	0	3 (50%)	0	0
Orchiectomy	0	0	8 (40%)	0
Orchiectomy with contralateral orchidopexy	0	3 (50%)	0	0
Incision & drainage	0	0	12 (60%)	0

Out of 6 cases of testicular torsion, in 3 cases we were able to save testis and bilateral orchiopexy was done. In 3 cases, simultaneous orchiectomy and contralateral orchiopexy were done. Out of 20 cases of pyocoele, 3 cases were complication of epididymo-orchitis and 2 of testicular torsion. In 8 cases, we found gangrenous testis, hence, orchiectomy was performed. In 12 cases of pyocoele, only incision and drainage was adequate. (Table 5)

Discussion:

The definitive diagnosis of the acute scrotum is important. Owing to varied differential diagnosis, the condition may be misdiagnosed and have significant implications for the patient. This study was conducted to understand the various aspects of acute scrotum from presentation to outcome. In the present study, epididymitis/orchitis was commonly seen in 21 to 60 years age group which is almost 60% of all cases and low occurrence in extremes of age groups; whereas testicular torsion was predominantly seen below 30 years (83.3%), and pyocoele after 40 years of age (70%). This is similar to other Indian studies.[6,7] Hazarika et al

reported maximum incidence of acute epididymo-orchitis in the 20-30 age group (30.77%).[6] Ingale et al reported 47% patients in the age group of 21-40 years.[7] Presence of comorbidities is an important factor as it may predispose a patient to certain types of acute scrotum. Comorbidities such as diabetes mellitus may contribute to reduced immunity of the patient. Diabetes mellitus was found in 2 cases of pyocoele in the present study, while retroviral disease found in one case of epididymo-orchitis. Balasubrahmanya et al reported diabetes mellitus in 24% patients, with 8% having Fournier's gangrene and 4% with scrotal abscess.[8] The duration from presenting symptom to hospital intervention may determine the outcome of the emergency condition. In present study, two cases (33.33%) of testicular torsion out of 6 cases presented before 24 hours; whereas all other cases of acute scrotum presented after 24 hours. It was possible to salvage the testis in 2 cases presenting within 24 hours, it was possible to save the testis. The prognosis has been reported to be good in patients of testicular torsion presenting within a short duration.[6] In another study, 41.72% patients presented in <6 hours while 19.42% presented between 6-12 hours of symptoms onset.[9] In a developing country like India, the time taken scrotal exploration may be severely affected, especially in areas with lack of infrastructure. Present study along with other studies emphasizes the importance of time factor and early scrotal exploration in suspected cases of torsion testis.

Conditions with acute scrotum may have more or less clinical presentation. In the present study, epididymitis/orchitis cases presented with variable symptoms such as pain in scrotum (71.6%), swelling of scrotum (70.3%) or both or with only abdominal pain (12.2%) and few with nausea/vomiting (4.05%), burning micturition (4.05%) and fever (22.9%). In case of infective conditions like epididymitis/orchitis and pyocoele, erythema and raised temperature were commonly encountered. Erythema was seen in only 1 case of testicular torsion and absent in other 5 cases. Temperature was found normal in all cases of testicular torsion and other non-infective conditions. The present study findings are similar to that reported in literature.[7,8] A preponderance of the side of testis has been reported earlier. Cavusoglu et al reported that the right testis was affected more in 67% cases of epididymo-orchitis, and the left side was affected in 33%, while in cases of testicular appendiceal torsion, the right

side was affected in 62% cases, and the left side was affected in 38% and in testicular torsion, the left testis was affected in 68% cases, and the right side was affected in 32%.[10] Hazarika et al reported, acute scrotal swelling common on right side (46.67%) as compared to left side (34.44%) and bilateral swellings in 18.89% cases.[6] In our study, testicular torsion (66.67%) and pyocoele (55%) were found more commonly on the right side and epididymitis/orchitis (59.4%) and others (100%) were more common on left side of scrotum. This finding was similar to other studies for testicular torsion and pyocoele, but not for epididymo-orchitis and others. Ultrasound has been documented to improve the accuracy of diagnosis of scrotal diseases. Although there is some variability regarding findings on color Doppler ultrasound, absent testicular flow, heterogeneous echotexture, enlarged scrotum, and decreased epididymal flow were shown to be good imaging indicators in our study. Balasubrahmanya et al observed that Color Doppler sonography yielded a positive and negative predictive value of 100% each for torsion, whereas, 93.9 and 70.6% for epididymo-orchitis, respectively; a sensitivity and specificity of 100% for torsion, whereas, for epididymo-orchitis it was found to be 86.1% and 85.7%, respectively.[8] High frequency real time sonography was clearly superior to clinical diagnosis. Color Doppler sonography is highly sensitive in diagnosing acute scrotal pathology and accurately differentiates testicular ischemia/torsion from acute inflammatory diseases.

The final diagnosis of acute scrotum cases is critical. In our study, 74 (72.54%) were epididymitis and/or orchitis, 6 (5.88%) were testicular torsion, 20 (18.6%) were pyocoele and 2 (1.96%) were others. Others include one case of left side orchitis related to adverse drug reaction and second was scrotal hematoma in operated case of left inguinal hernia. Initially, 77 cases of epididymo-orchitis were diagnosed on clinical basis, but with due course of time, 3 cases progressed to pyocoele and were successively explored and confirmed. So finally, there were 74 cases of epididymo-orchitis; out of them 63 were also having similar radiological diagnosis. In final diagnosis, there were 20 cases of pyocoele but only 17 cases were diagnosed clinically, rest 3 cases were earlier diagnosed as epididymo-orchitis but in spite of anti-inflammatory and antibiotics treatment these progressed to pyocoele. Ingale et al observed that acute epididymo-orchitis (44%) was the commonest cause for acute scrotal pathology

followed by Fournier's gangrene (30%), incidence of scrotal cellulitis, hematocele, pyocoele, torsion was 8%, 6%, 6% and 4% respectively and two cases of testicular abscess were also found.[7] Hazarika et al observed acute epididymo-orchitis (43.33%) as the commonest cause for acute scrotal pathology followed by testicular torsion (21.11%) and Fournier's gangrene (16.67%).[6] Cavusoglu et al found epididymo-orchitis in 37.4%, testicular appendages torsion in 32.3% and testicular torsion in 29.2%.[10] Beni-Israel et al found most common cause of acute scrotum as epididymitis (32.3%), scrotal pain of unknown etiology (34%) trauma (9%), torsion of appendix of testis (7%) and testicular torsion only in 3.3% cases.[11] Hegele et al found testicular torsion as most common cause in 53% patients, followed by torsion of the testis appendages in 25%, acute epididymo-orchitis in 13% and other etiologies in 9%.[12] The incidence of testicular torsion in the current study was lower than in previous reports. This may be as all age groups and not only pediatric cases were included, unlike most of other studies. Our study included all patients presenting with acute scrotal symptoms, including those presenting with testicular pain with no abnormalities on physical examination. The setting in which the study was conducted is another possible explanation for the relatively low incidence of testicular torsion. Studies conducted in the surgical or urologic wards reported a very high incidence of testicular torsion. The patient population in those studies does not represent the typical patient presenting to emergency department with immediate onset of scrotal symptoms. Indeed, studies conducted in the emergency department setting reported lower incidences of testicular torsion, although still higher than the current study. Surgical procedures were performed in most of patients. In cases of testicular torsion, in 50% cases bilateral orchiopexy was done, while in remaining 50% simultaneous orchiectomy and contralateral orchiopexy were done. Most of pyocoele cases were managed using incision and drainage. In conditions showing gangrenous testis, orchiectomy was performed.

Conclusion:

Overlap exists between testicular torsion and other conditions of acute scrotum which present mainly in the younger population. The clinical manifestations, physical examination findings, and laboratory test results are helpful in distinguishing the etiology; however, ultrasonography and colour Doppler prove to be of utmost help in the diagnosis

and immediate treatment for testicular torsion. Conservative treatment given in the form of rest, scrotal support, antibiotics and analgesics for epididymo-orchitis and hematoma showed a favorable response. Surgical exploration undertaken without delay maximizes chances of testicular salvage in testicular torsion and pyocele.

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