

A PROSPECTIVE STUDYE OF EVALUATION & MANAGEMENT OF ACUTE SCROTAL SWELLINGS IN RURAL SOUTH INDIA

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Received : 20/07/2022
Received in revised form : 09/09/2022
Accepted : 19/09/2022

Keywords:

Acute scrotum,
Epididymo-Orchitis,
Torsion of Testis,
Fournier's Gangrene.

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DOI: 10.47009/jamp.2022.4.4.79

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2022; 4 (4); 400-405



Abstract

Background: One definition of acute scrotum states that it is characterised by "the acute development of pain and swelling of the scrotum that necessitates either emergency surgical intervention or particular medicinal therapy". There are a wide variety of possible diagnoses, and there are both immediate and long-term consequences. Misdiagnosis and delayed presentation are major contributors to low salvage rates. The most common reason for testis removal is still a late appearance. **Materials and Methods:** This prospective study was included patients between the ages of 7y and 80y exhibiting symptoms of acute pain and swelling in the scrotum, trauma, urine symptoms, and fever. Ultra sound scrotum and colour Doppler was carried out on all the subjects. The options for treatment were either surgical or conservative. All patients were followed up for a period of one month. **Result:** Scrotal abscess and epididymo-orchitis were identified in 24 of 68 individuals. Epididymo-orchitis was most common between the ages of 31 and 48, while Scrotal abscess was most common between the ages of 48 and 58. Epididymo-orchitis was frequently associated with variables such recent trauma, urinary symptoms, and urethral instrumentation. Among all the study subjects 68% were treated with conservative treatment and 38% were treated with surgical modality. Doppler ultrasonography showed sensitivity of 94.5% and specificity 99%. Due to septicemia, one patient who had surgery for Fournier's gangrene died afterward. **Conclusion:** Middle aged manual labourers with diabeteses are more prone for scrotal abscess and Fournier's gangrene. Ultrasonography and colour Doppler are of utmost aid in the diagnosis and rapid treatment of testicular torsion, however the clinical signs, physical examination findings, and laboratory test results are useful in differentiating the aetiology.

INTRODUCTION

Scrotal pain and swelling that develops suddenly and need prompt medical attention or emergency surgical intervention is what's meant by the term "acute scrotum." There is a wide range of possible triggers for acute scrotum problems. Testicular torsion, appendiceal torsion, epididymo-orchitis, scrotal wall abscess, Fournier's gangrene, scrotal haematoma, pyocele, and various other conditions such as idiopathic scrotal oedema, scrotal fat necrosis, Henoch Schonleinpurpura, ischemic orchitis, etc.^[1]

Torsion of Testis

Delasiauve initially characterised torsion of the testes in 1840.^[2] A true surgical emergency, torsion of the testis or spermatic cord cuts off blood flow to the testes, leading to their death and atrophy. In youngsters, scrotal swelling of sudden onset suggests testicular torsion unless otherwise established. About two-thirds of patients can be correctly diagnosed based on patient history and physical alone.^[3] Torsion of the testicles can occur for two main reasons. Torsion of the spermatic cord (testicle) occurs intravaginally when the testis twists within the tunica vaginalis; torsion of the testis occurs extravaginally in the perinatal period prior to fixation of the tunica vaginalis within the scrotum.^[4]

Some cases of testicular torsion have been documented in infants.^[5] However, the age range of 10–25 years is when the condition is most frequently observed. If the torsion is released within 4 hours of the incident, the testis will be completely viable; between 4 and 16 hours, 89% of testes will be salvageable; and after 16 hours, just 25% will be. These testicular viability values show that surgery is always an absolute last resort.^[6]

Acute epididymitis, Acute epididymo-orchitis and Orchitis: Epididymo-orchitis has been defined as an inflammatory process affecting both the epididymis and the testes.^[7] This clinical condition typically presents unexpectedly and results in excruciating pain and edoema. It can be caused by uropathogens that spread from the urinary system or by sexually transmitted illnesses that go up the urethra. Epididymo-orchitis was estimated to have a 65% prevalence in a retrospective assessment of 65 children referred within 5 hours with acute scrotal pain by Klin et al. From all the men checked, 42 (65%) had epididymitis, 5 (8%), torsion of the appendix testis, and 12 (18%) had torsion of the testis.^[8] The results of a surgical examination of the scrotum in 70 children and adolescents with acute pain were described by Ben Chaim et al. Torsion of the testicles accounted for 34% of all cases, with acute inflammation accounting for the remaining 66%. Thirteen of the 46 cases in which bending the gonad appendages had an effect on inflammation showed improvement, while the other 13 showed the opposite.^[9] Potential TB symptoms include focal epididymitis, a draining sinus, and the classic beading of the vas deferens with systemic involvement.^[10]

Fournier's Gangrene

Necrotizing infection, or "gangrene," affects the deep and superficial fascia of the male genitalia in Fournier's syndrome. Studying 51 people (49 men and 2 women), Yan-Dong Li et al.^[11] found that the average age of onset for FG is 51.6 years (Range: 17-80 years). Although FG is more common in men, the disease has been documented in women at a 10:1 ratio.^[12]

Even while scrotal abscess is more common in children with appendicitis, a patent processus vaginalis peritonei can occur at any age. A thorough patient history and physical, supplemented by pertinent imaging studies, should allow for a correct diagnosis in the vast majority of cases.

The diagnosis and treatment of acute scrotal diseases have been documented using a wide range of diagnostic techniques. The tests range from the straightforward urine analysis to the more complex ultrasonography and Color Doppler examinations.^[13,14,15]

Aims & Objectives

- To ascertain various types of acute scrotal swellings.

- To study the differential diagnosis for common causes of painful scrotum.
- To study clinical presentation.
- To make early diagnosis.
- To manage appropriately.
- Prevent morbidity and mortality.

MATERIALS AND METHODS

Place of Study

Department of General surgery, Dr SMCSI Medical college, Karakonam village, Trivandrum (District), Kerala.

Duration of study

Two years of study from April 2020 to May 2022.

Study Design: A prospective study.

Source of Data

Patients who reported acute pain and swelling in the scrotum and who were seen in the surgical outpatient department of General Surgery, Dr. SMCSI Medical College between April 2020 and May 2022 were included in the study and analysed thoroughly according to the proforma. A total of 68 people were analysed in this study.

Method of Collection of Data

All of the patient's clinical data, including signs and symptoms, diagnostic workup, operational findings, postoperative complications, and death rates, were put into a standardised data entry form for analysis. When necessary, patients were followed up with for more than a month.

Inclusion Criteria

Patients of any age who reported acute scrotal pain and swelling were included in the study.

Exclusion Criteria

Patients with painless scrotal swelling and chronic scrotal pain were excluded from the study.

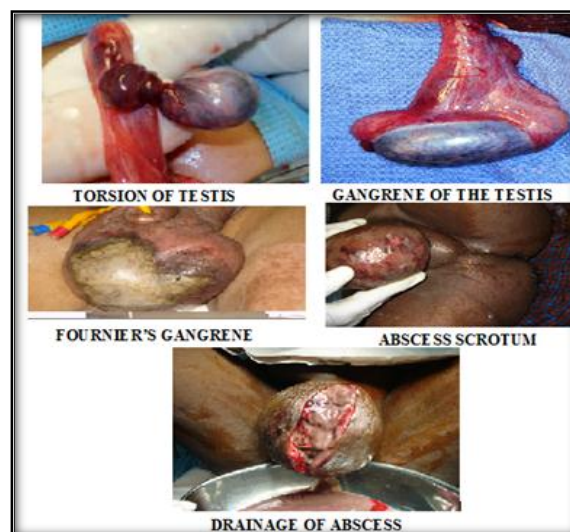


Figure 1: Scrotal swellings

RESULTS

1) Incidence of various types of lesions:
Abul F, Al-Sayer H, Arun N in a review of 40 acute patients hospitalized for acute scrotum showed that the most common etiology of acute scrotal swelling

was epididymitis (60%). This was followed by testicular torsion, torsion of the appendages and acute idiopathic scrotal swelling in 27.5%, 10%, and 2.5%, respectively. In our study incidence of lesions as follows.

Table 1: Incidence of lesions

Si No	Lesions	No Of Cases	Percentage
1	Epididymo-orchitis	24	35.29%
2	Epididymitis	4	5.88%
3	Orchitis	9	13.23%
4	Fournier's Gangrene	6	8.82%
5	Torsion of testis	5	7.35%
6	Cellulitis of scrotum	5	7.35%
7	Pyocele	1	1.47%
8	Scrotal abscess	11	16.17%
9	Traumatic Scrotal Hematoma	3	4.41%

In our study Acuteepididymo-orchitis being the commonest cause for the acute scrotal pathology followed by Scrotal abscess and Orchitis. Epididymo-orchitis was seen in 35.29% cases, scrotal abscess was in 16.17% cases, orchitis was in 13.23% cases. Torsion of testis was seen in 5 cases (7.35%) and Fournier's gangrene in 6 cases (8.82%).

Table 2: Distribution of Age

Age in Year	No Of Cases	Percentage
0-10	1	1.47%
11-20	5	7.35%
21-30	8	11.76%
31-40	6	8.82%
41-50	15	22.05%
51-60	16	23.52%
61-70	7	10.29%
71-80	9	13.23%

The overall age incidence is shown in table. The maximum incidence of acute scrotal swellings occurred between the age group of 51-60 years. In our study the age incidence for acute epididymo - orchitis was maximum in the 41 – 50 group (45.37%).

Table 3: Duration of Symptoms

Duration	No cases	Percentage
0-24hrs	6	8.82%
1-7 days	56	82.35%
8-16days	4	5.88%
16-30days	2	2.94%
>30 days		
Total		100%

Duration of symptoms varied from 1day to as long as 1 month. The shortest duration of symptoms in this study was 20hrs & longest duration was one month.

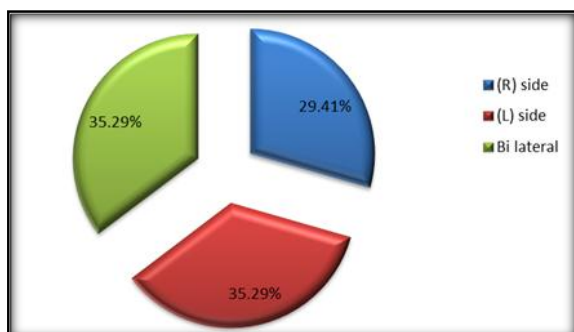


Figure 2: Distribution of Symptoms

After analysing 68 instances, researchers found that acute scrotal edoema was more common on the left side (35.29% of cases) than on the right (29.41%). In 35.29 percent of instances, both sides were affected by the swelling.

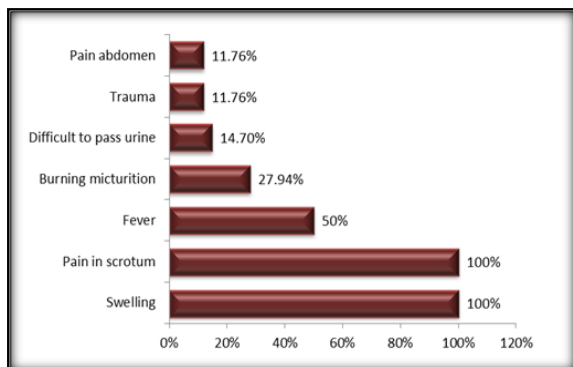


Figure 3: Presentation of Symptoms

At presentation, there was enlargement of the scrotum and discomfort in all instances. Fever was reported by 50% of patients, and burning micturition was reported by 29%. About 15% of people experienced trouble urinating. Both trauma and abdominal pain were reported by 11.76 percent of people.

The scrotum swelled in all cases, and the patients were in pain. Fever was reported by 50% of patients, and burning micturition was reported by 29%. Urinary retention affected 14.70% of the population. In 11.76 percent of people, there was trauma and in 11.76 percent there was abdominal pain.

Seventy-one percent of patients with epididymo-orchitis and six-sixty-six percent of patients with Fournier's gangrene experienced fever". Thirty-seven percent of epididymo-orchitis cases were accompanied by urinary symptoms. Among the four instances with scrotal hematoma, two had a history of trauma, as did two of the epididymo-orchitis cases.

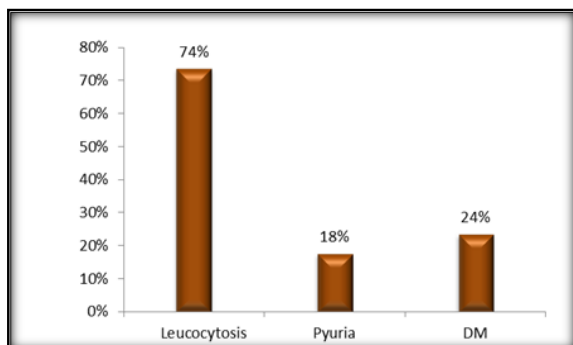


Figure 4: Investigations

Haemogram, urine analysis, blood sugar, and Doppler ultrasound were performed on all 68 patients.

Urine microscopy revealed pyuria in 12 of our 50 cases and leucocytosis in 50. In 16 instances, the blood sugar was high. Uncontrolled Diabetes was associated with Scrotal abscess and Fourniers gangrene. Doppler USG of the scrotum was performed in every patient, and its sensitivity was 94.5% and its specificity was 99%. When ultrasonography was used to diagnose acute epididymo-orchitis, the testis was seen to be hypoechoic and enlarged all throughout. Swelling

and increased echoic activity in the epididymis. Pyocele was characterised by heterogeneous echogenicity around the testis, indicating purulent accumulation within a swollen scrotal sac. Haematocele exhibited a pattern similar to this. The ultrasonic diagnosis of haematocele versus pyocele is challenging in this case.

Only 12% of the 68 instances had normal urine output. In 81% of the samples, *E. coli* thrived; in 8%, *Klebsiella* did; in 5%, *Pseudomonas* did; and in 3%, *Proteus mirabilis* did.

The bacteriology of pus cultures was available in 16 of 68 cases. Sixty-seven percent of the time, *Staph aureus* thrived, compared to *Pseudomonas* at 21% and *Klebsiella* and *E. coli* at 8% and 4%, respectively. Fifty of the patients in our research had signs of acute infection, including an increase in total leucocyte count. Thorsteinn Gislason found leucocytosis in 44% of his series, but we found it in 70% of ours.^[15] Positive bacterial culture was observed in 33.3%, as reported by Teoman Eskitaşolu et al. [2014]. In contrast to earlier studies, ours found that *E. coli* was the most commonly isolated mono-microbial organism.

Antibiotic treatment was completed within 7 days in 76% of patients and beyond 7 days in 24% of cases in this study.

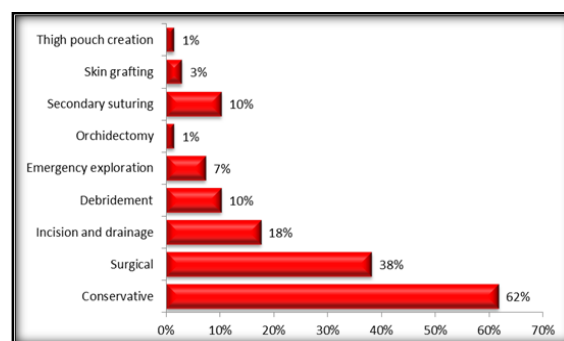


Figure 5: Treatment Given

Conservative Treatment

42 patients (61.76%) out of 68 received only conservative care. Twenty-four cases of epididymo-orchitis, four cases of epididymitis, nine cases of orchitis, and five cases of cellulites of the scrotum were all treated conservatively with rest, scrotal support, antibiotics, analgesics, and surgical removal in three cases. The recommended period of confinement ranged from seventeen to twenty-one days.

Surgical Treatment

Scrotal abscesses and pyoceles were surgically treated by incision and drainage on seven patients. Six patients were diagnosed with Fournier's gangrene, although only five underwent debridement. Seven patients required secondary suturing, and two patients required skin grafting. Five individuals underwent scrotal examination, with testes being saved in four of those cases. In one patient, an orchidectomy was necessary.

Results of Treatment

Patients who responded well to conservative care improved significantly. Twenty-eight of the thirty patients who had surgery recovered without any complications, while two others were hospitalised with wound infections.

Patients receiving non-surgical care spent an average of 3.8 days in the hospital. The median length of hospitalisation for patients with Fournier's gangrene is 10.11 days.

Follow up

Each individual was tracked for a full month. There were two cases of problems, both of which were treated with antibiotics and painkillers.

Ninety-three percent of the patients in this study had a full recovery without any complications; six percent made a partial recovery with complications; and one percent of the patients with Fournier's gangrene and septicemia died.

DISCUSSION

Prognostic Factors

1. Age

Acute scrotal swellings were most common between the ages of 51 and 60. The highest prevalence of acute epididymo-orchitis in our study occurred between the ages of 41 and 50 (45.37%). Particularly among the elderly, necrotizing scrotal infections pose a serious threat of morbidity and mortality. Even though the recovery was slightly delayed in this group, all patients responded well to the treatment. As a result, age shouldn't be a factor in whether or not active management is provided.

2. Diabetes Mellitus

In the past, diabetes mellitus was seen as a very negative indicator of health. The mortality rate can be lowered by early diagnosis, rigorous first surgical debridement, and tight control of diabetes. Our study found that only one percent of diabetics with necrotizing scrotal infection died from their condition. Moreover, we found no statistically significant difference in hospitalisation duration between diabetics and non-diabetics. It follows that the presence of diabetes mellitus alone does not alter the fate of patients with necrotizing scrotal infections provided the concepts of early diagnosis, substantial initial debridement, meticulous daily wound care, and rigorous diabetic control are adhered to correctly.

3. Native Medicines and Local Massage

Our research shows that the severity of an illness is directly related to the frequency with which patients engage in self-medication strategies including excessive usage of non-steroidal anti-inflammatory drugs (NSAIDs) and steroids to alleviate their symptoms. Patients whose condition worsened after

they massaged oil into the affected area on multiple occasions were more likely to have widespread disease. It is likely that applying oils and massaging the damaged and inflamed area increases the area of ischemia and contributes in spreading the infections along the fascial planes, leading to significant skin necrosis and associated septic consequences.

4. Delayed Presentation

Patients who presented late that are more than 2 days, they recovered late than the patients who presented early, the fact which was evident from this study.

5. Extensive Disease

In most cases, a urethral catheter is used to divert urine. If the bladder can't be drained via the urethra, a suprapubiccystostomy may be performed. Sometimes the testicles will survive the necrotizing process. Orchidectomy should be performed if the testicle is at risk or if its viability is in question.

6. Comorbid Conditions

The results of this study showed that patients with various co-morbid illnesses, such as diabetes, renal failure, hepatic dysfunction, and a history of self-medication, had a longer mean hospital stay of 11 days before reaching a stable condition.

7. Recurrent UTI

It was noticed from the study that, patients who had recurrent UTI, developed epididymo-orchitis more frequently than non-UTI patients.

8. Urethral Instrumentation

Patients who had recent instrumentation had developed epididymo- orchitis more frequently.

9. Sexually Transmitted Disease

In this study it was also noticed that, patients who had Sexually transmitted diseases has developed acute scrotum more.

10. Filarial Endemic Zone

Patients who are from kanyakumari and Trivandrum districts which are a filarial endemic zone according to WHO,17 had acute scrotum in 12 cases out of 46 cases of acute scrotum.

11. Nutrition

Necrotizing perianal infections are more likely to occur in those who are malnourished. As well as making malnourished and diabetic patients more susceptible to infection, impaired immune function also increases morbidity by extending the time it takes for patients to recover.

12. Antibiotics

Adjuvant antibiotic medication is administered, but early surgical debridement is what really saves lives. Injectable antibiotics are the treatment of choice. Our research showed that E. coli was the most common pathogen in urine and pus cultures,

followed by *Klebsiella* and *staphylococcus*. Antibiotics need to be effective against a wide variety of bacteria, thus they must be able to combat both anaerobic and aerobic strains. Before receiving the culture and sensitivity results, the selection of antimicrobial drugs might be aided by knowledge of the bacteriology of infection in a specific region and a study of the gramme stain. Patients who are not experiencing septicemia are given antibiotics targeted at that organism, while those who are experiencing septicemia are given broad range antibiotics. Carbapenems (Imipenem, meropenem, ertapenem) and Piperacillin-tazobactam are currently recommended by new clinical guidelines. More people can use these modern medications because of their wider dispersion and lower kidney toxicity contrasted with aminoglycosides.

CONCLUSION

Our research reveals that scrotal abscesses are the second most common ailment after acute epididymo-orchitis. Middle aged labourers with Diabetes are more prone for scrotal abscess and Fournier's gangrene. Until otherwise demonstrated, acute scrotal enlargement in children and young adolescents should be considered to be due to torsion of the testis, necessitating a thorough examination, accurate evaluation, and speedy treatment with early surgical surgery.

Scrotal abscesses and Fournier's gangrene cannot be cured with antibiotics alone; surgical debridement is also required.

An individual's age, delay in seeking treatment, the existence of various co-morbid illnesses, the occurrence of recurrent UTIs, the use of urethral instruments, and the severity of the disease all play a role in prognosis.

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