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CLINICAL, BIOCHEMICAL AND RADIOLOGICAL STUDY OF ACUTE SCROTAL SWELLINGS

General Surgery

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ABSTRACT

Background: Acute scrotum is a common urological emergency condition requiring rapid evaluation and urgent surgical intervention and specific medical therapy if required, due to the time dependency of certain morbid but reversible conditions, such as torsion testis. Although these swellings are frequently encountered, many a time testis could not be salvaged due to late or incorrect diagnosis. **Objective**: Assessment of different acute scrotal conditions in terms of clinical findings (signs and symptoms), Relative incidence of different etiological factors, Assessment of various bio-chemical findings. **Methodology**: This is a prospective study of 80 patients of acute scrotum carried out in Department of General surgery, Patna Medical College and Hospital, Patna from September 2020 to July 2023. **Result**: Out of 80 patients included in the study, 35 patients had right side, 25 patients had left side and 19 patients had bilateral involvement of acute scrotal swellings. The mean age of study population was years. Acute epididymo-orchitis was found to be the commonest cause of acute scrotum followed by Fournier's gangrene and hematocele. It was more common among younger and middle-aged individuals and those involved in strenuous works. The maximum incidence of acute scrotal swellings was found to be present in 41-50 years age group. The most common predisposing factors of acute scrotum was found to be idiopathic. Scrotal swelling with pain was the commonest presenting symptom. All the patients of acute epididymo-orchitis were managed by conservative approach while rest all the patients were managed surgically. Post-operative complications were hematoma (2.5%), seroma (6.25%), surgical site infections (6.25%), induration (5%) and chronic groin pain (2.5%). USG scrotum was not done in patients of Fournier's gangrene and scrotal wall abscess and found to be conclusive in rest all the patients of acute scrotum except 10 cases of acute epididymo-orchitis. E. coli was the commonest organism found in urine culture. Swab culture of all the patients of Fournier's gangrene yielded polymicrobial growth (Proteus, klebsiella etc.) in 31.57% and monomicrobial growth in 68.43% cases. **Conclusion**: Any patient presenting with acute scrotum, torsion testis must be considered and evaluated. All the patients must be subjected to USG doppler of the scrotum. In patients with torsion testis presenting within 6 hours of onset of symptoms, testis can be savaged.

KEYWORDS

Acute scrotum, Torsion testis, Epididymo-orchitis, Fournier's gangrene, Polymicrobial.

INTRODUCTION

Acute scrotum is defined as "the acute onset of pain and swelling of the scrotum and its contents accompanied by local signs and generalized symptoms" [1]. It is a common urological emergency that requires either surgical intervention or specific medical therapy. It is a diagnostic dilemma because of its diverse etiologies and the extreme tenderness over the area that makes clinical examination difficult. Although these swellings are frequently encountered, many a time testis could not be savaged due to late or incorrect diagnosis.

Acute scrotal swellings are the commonest swellings that affect both children and adults. The conditions of acute scrotum can occur due to wide variety of causes.

These include torsion testis, torsion of appendix testis, acute epididymo-orchitis, Fournier's gangrene, scrotal wall abscess, hematocele, testicular tumor and some of the miscellaneous conditions like idiopathic scrotal edema, scrotal wall necrosis, Henoch Schoenlein Purpura, ischemic orchitis etc. Amongst these conditions, testicular torsion, epididymo-orchitis and Fournier's gangrene deserve special attention because of their prevalence and severity.

Knowledge of the relevant scrotal anatomy and physiology is essential in understanding the differential diagnosis and subsequent steps in evaluation of acute scrotal swellings.

The primary objective of management of acute scrotum is to avoid testicular loss. Torsion testis is an important differential diagnosis in the setting of acute scrotum that requires urgent scrotal exploration to avoid testicular loss. Testicular torsion was first described by Delasiauve in 1840 [2]. The likelihood of testicular salvage in torsion testis depends on the interval between onset of pain and surgery.

In a substantial number of cases, it is difficult to differentiate torsion testis from non-torsion conditions especially epididymo-orchitis merely based on clinical features. A reliable test is, therefore, necessary to investigate all cases of acute scrotum to correctly establish the diagnosis and to prevent the complications.

MATERIALS AND METHODS

This study was a prospective study undertaken at PATNA MEDICAL COLLEGE AND HOSPITAL (PMCH), Patna on patients of acute scrotal swellings admitted through surgical OPD and emergency. The study was conducted during the period from September 2020 to July 2023. The patients were selected based on the inclusion and exclusion criteria. A total of 80 patients (with acute scrotum) were randomly selected and included in the study.

Inclusion Criteria

All the patients presenting with acute scrotum of all age group, including those with history of trauma.

Excusion Criteria

1. Patients unwilling to participate in the study.
2. Patients on anticoagulant therapy and with bleeding disorders.

The study was conducted in accordance with the ethical Principles of Helsinki and was approved by the relevant committee of the institute. Written informed consent was taken from each patient after explaining in detail about the objective of study, risks and benefits, confidential handing of persona information and the voluntary nature of participation and the right to withdraw anywhere from the study etc.

RESULTS

This study comprised of 80 patients of acute scrotum admitted through

surgical OPD and emergency. The overall mean age of patients included in the study was 44.55 ± 0.708 years. The most common cause of acute scrotum was found to be acute epididymo-orchitis (43.75%).

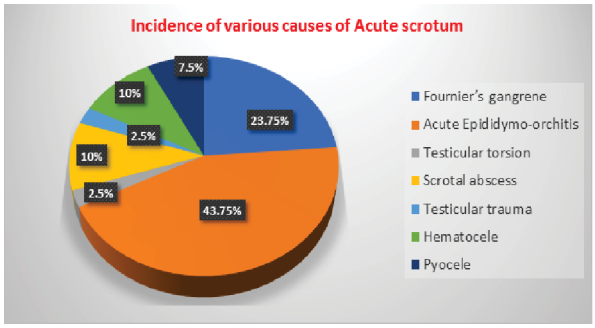

Figure: 1. Incidence of various causes of Acute scrotum

Acute scrotum was found to be more predominant on the right side of scrotum (43.75%) than the left one (31.25%).

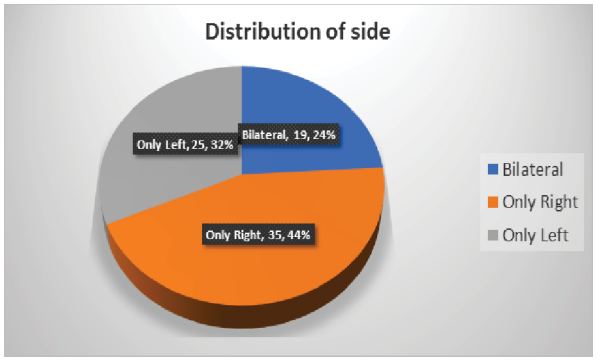

Figure: 2. Distribution of side

The most common predisposing factor for acute scrotum was found to be idiopathic (28.75%).

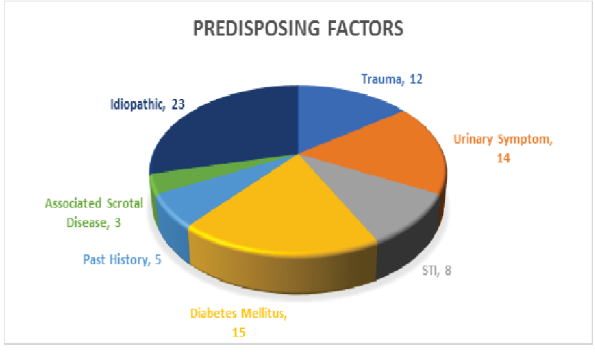

Figure: 3. Predisposing factors

The most common presenting symptoms was found to be scrotal swelling with pain (100%).

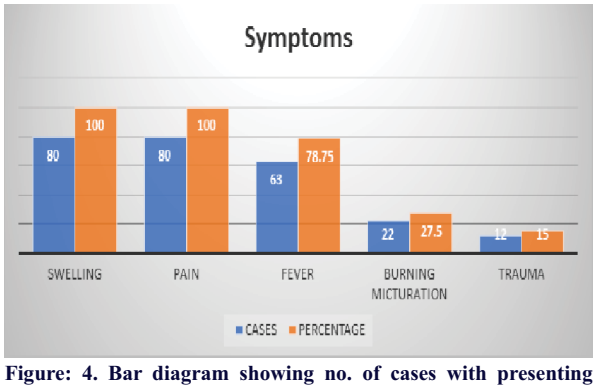

Figure: 4. Bar diagram showing no. of cases with presenting symptoms

Post-operative complications were as follows:

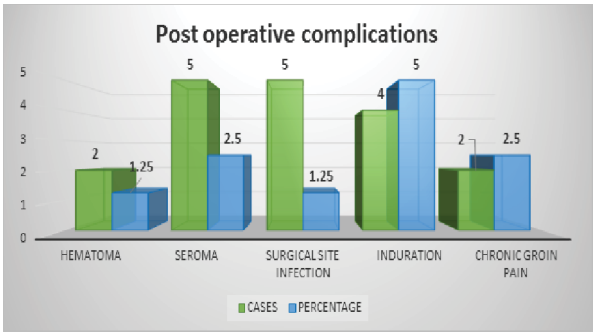

Figure: 5. Bar diagram showing post operative complications in follow-up patients

In our study, wound swab culture was done in all 19 cases of Fournier's gangrene and results was tabulated below:

GROWTH TYPE	NUMBER (N=19)	PERCENTAGE (%)	ORGANISM	NUMBER (N=19)	PERCENTAGE (%)
Mono-microbial	13	68.42	E. coli	08	61.5
			Klebsiella	02	15.38
			Pseudo-Monas	02	15.38
			Strepto-Coccus	01	7.69
			Total	13	100.00
Poly-microbial	06	31.57	Proteus, Klebsiella etc.	06	

Microbiological characteristics of wound swab culture in patients of Fournier's gangrene

DISCUSSION

The present study is based on clinical analysis with radiological findings and micro-biological study of 80 cases of acute scrotal swellings, which were admitted through surgical OPD and emergency in Patna Medical College and Hospital (PMCH) during the period from September 2020 to July 2023.

In this study, acute epididymo-orchitis was found to be the commonest cause accounting for 43.75% of total cases of acute scrotum followed by Fournier's Gangrene (23.75%), scrotal abscess (10%), hematocele (10%), pyocele (7.5%), testicular torsion (2.5%) and testicular trauma (2.5%). The rare acute conditions like scrotal fat necrosis, Henoch Schonlein Purpura, acute Idiopathic scrotal edema, testicular tumor etc. had not been encountered in the present study. So, no remarks can be made in that respect.

Incidence of various causes:

Paul S Sanjay (2016) in his prospective observational study on a total of 50 cases of acute scrotal swellings found that acute epididymo-orchitis (30%) was found to be the commonest condition followed by Fournier's gangrene (24%) and hematocele (12%) [3].

Sharath Rajkumar (2017), in his retrospective and prospective on a total of 60 patients of acute scrotum showed that acute epididymo-orchitis was found to be the commonest cause for acute scrotum accounting for 40% of total cases followed by Fournier's gangrene (16.66%) and torsion testis (11.66%) [4].

Our study was in accordance with the aforesaid study and found that the commonest cause of acute scrotum was acute epididymo-orchitis (43.75%) followed by Fournier's gangrene (23.75%). However, the incidence of torsion testis was significantly lowered in our study.

Age wise disease distribution:

Sharath Rajkumar (2017), in his retrospective and prospective study of acute scrotal swelling on a total of 60 patients found that majority of cases were in the age group of 41-60 yrs. The mean age of occurrence of epididymo-orchitis was 51 years in aforesaid study whereas N. A. Watkin (1996) found it to be 21.3 years [5].

In our study, majority of cases were in the age group of 41-50 years (37.5%) and the incidence of acute epididymo-orchitis, and Fournier's

gangrene was maximum in between 31-40 years age group and 41-50 years age group respectively, mean being 35.29 years for acute epididymo-orchitis and 45.63 years for Fournier's gangrene. In comparison with other studies, our study found that acute epididymo-orchitis and Fournier's gangrene had got an early presentation.

Duration of symptoms since presentation:
In the study done by Sharath Rajkumar (2017), the duration of symptoms varied from few hours to more than a week. The shortest duration being 3 hours and the longest duration being 12 days. The average duration of symptoms from onset till presentation was 3-6 days in case of epididymo-orchitis while that of Fournier's gangrene was 5-11 days.

Our study was in accordance with aforesaid study and found that the duration of symptoms varied from few hours to as long as 1 week. The shortest duration of symptoms in this study was 8 hours and longest duration was 1 week. The average duration of pain from onset till presentation in case of acute epididymo-orchitis was 3 days as opposed to 4 days in a study observed by Ricardo et al (2012) [6]. The average duration of symptoms from onset till presentation in case of Fournier's was 7 days in our study.

Presenting symptoms:
Paul S. Sanjay (2016) in his prospective observation study of acute scrotum on a total of 50 patients observed that all patients had swelling of scrotum associated with pain at the time of presentation. Out of 50 cases, 60% (n=30) had a history of fever, 18% (n=9) had a history of burning micturition, 14% (n=7) had a history of trauma, 2% had difficulty in micturition.

Unlike aforesaid studies, our study found that all patients had scrotal swellings associated with pain (n=80,100%) at the time of presentation. Out of 80 patients, 78.75 % (n=63) had a history of fever, 17.5% had a history of urinary symptoms and 15% had a history of trauma. History of trauma was present in all 2 cases of torsion testis and testicular injury and 4 cases of hematocele.

Predisposing factors:
In the study on a total of 50 cases of acute scrotal condition done by Paul S Sanjay (2016), there was a history of trauma in 6 cases of hematocele and in one case of testicular torsion. There was a history of urinary symptoms in 9 cases of epididymo-orchitis and in 1 case of epididymitis.

In our study, there was a history of trauma in 4 cases of hematocele, 2 cases of pyocele, 2 cases of testicular torsion and 4 cases of testicular trauma. There was history of urinary symptoms in 12 cases of epididymo-orchitis and 2 cases of scrotal abscess. Like other studies, majority of cases in our study were idiopathic in origin (n=23, 28.75%).

Distribution of side and site involvement:
Paul S Sanjay (2016) in his prospective observational study on a total of 50 cases of acute scrotal swellings found that the affection of Fournier's gangrene was mainly scrotal with perineal extension in 3 cases. It was observed that acute scrotal swelling was common on right side occurring for 52% cases as compared to left side (32%). Bilateral swellings were common in 16% of cases.

Unlike aforesaid studies, it was found that the affection of Fournier's gangrene was mainly scrotal with perineal extension in 5 cases and the acute scrotal swelling was found to be most common on right side accounting for 43.75% as compared to left side (31.25%) in our study. Bilateral swellings were found in 23.75% of cases.

Biochemical investigation:
In our study there was increase in total leucocyte count in 63 cases (78.75%), showing acute infection. In his series, Thorstein Gislason (2009) found leucocytosis to be present in 44% cases [7]. Teoman Eskitascloglu et. al (2014) reported positive bacteriologic cultures in 74 patients (92.5%) and sterile growth in 7.5%. The infection was poly-microbial in 14 cases (17.5%). E. coli was the most frequently identified microorganism (53.75%) followed by staphylococcus aureus (15%) [8].

Paul S Sanjay (2016) in his prospective observational study of acute scrotal swellings on a total of 50 cases, observed presence of mono-microbial organism in majority of cases (66.66%) as compared to poly-microbial growth (33.33%) in a wound swab culture done in 12 cases of Fournier's gangrene. Among mono-microbial organism, the most common organism in decreasing order of frequency were gram negative E. coli (37.5%), klebsiella (25%), Pseudomonas (25%) and Citrobacter (12.5%). Poly -microbial growth included growth of Proteus, Pseudomonas, Klebsiella, E. coli.

In our study of 19 patients of Fournier's gangrene, wound swab culture yielded predominantly mono -microbial growth (68.42%) in majority of cases as compared to poly-microbial growth (31.57%). There was no negative bacterial culture found in our study. Mono-microbial organism found in our study in decreasing order of frequency included E. coli (61.5%), Klebsiella (15.38) and Pseudomonas (15.38), Streptococcus (7.69%). Poly-microbial growth included growth of Proteus, Klebsiella etc. Urine culture examination revealed sterile growth in 18.75 % cases and E. coli (37.5%) was found to be the commonest bacterial growth in urine followed by klebsiella (18.75%).

Radiological investigation: .
In the retrospective and observational study done by Sharath Rajkumar (2017) on a total of 60 patients of acute scrotal swelling, found that all the patients underwent USG except for the cases of Fournier's gangrene and scrotal wall abscess. USG was found to have conclusive results in all the patients.

Unlike aforesaid studies, our study observed that USG scrotum and duplex scan was carried out in all patients except Fournier's gangrene and scrotal wall abscess. USG scrotum done in patients of acute epididymo-orchitis (n=35) was found to be inconclusive in 10 patients out of 35 patients. USG scrotum done in all the patients of pyocele, hematocele, and testicular trauma while duplex scan done in all patients of torsion testis were found to be conclusive of the disease.

CONCLUSION
Results of the study concluded that acute scrotum is a very common condition seen in the outpatient department with considerable morbidity, which requires careful examination, proper evaluation (by means of biochemical and radiological investigations) and prompt treatment. The primary objective of management of acute scrotum is to avoid testicular loss. Torsion testis is an important differential diagnosis in case of acute scrotum, which requires urgent scrotal exploration. Any young patient presenting with acute scrotum within 6 hours of onset of symptoms, torsion testis must be considered and ruled out so that testicular salvage is reached 100%. All the patients must be subjected to duplex scan.

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