

A STUDY OF ACUTE SCROTUM AT RIMS TERTIARY CARE HOSPITAL

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ABSTRACT:

INTRODUCTION

Several acute scrotal conditions can present in similar way, testicular torsion is by far the most significant. Testicular torsion is a true surgical emergency because, the likelihood of testicular salvage decreases, as the duration of torsion increases. Other conditions that presents in similar way to testicular torsion include, torsion of appendix testis, epididymo-orchitis, trauma to testis, haematocele, strangulated inguinal hernia, Henoch-Schonlein purpura etc. A variety of investigations have been described in the management of acute scrotal conditions. These include an array of tests from a simple urine examination to more sophisticated forms like ultrasonography, Doppler studies and radionucleotide scanning. In case of epididymo-orchitis conservative approach yields good results and prevents complications. But ultimately for acute scrotum scrotal exploration remains as gold standard approach. Aim: To study clinical presentation, differential diagnosis and management of acute scrotum. METHODOLOGY: Prospective study, in Department of general surgery, Government General Hospital, Kadapa from 22nd december 2018 to 21st december 2020 in 100 cases. RESULTS: In present study most common condition is epididymo-orchitis with 35 cases(35%) followed by fournier's gangrene30(30%), Pyocele16(16%), haematoma 10(10%), torsion 8(8%) and scrotal wall abscess 1(1%). Symptom wise pain and swelling were the presenting complaints in all the patients involved in the study. CONCLUSION: Torsion is common in younger age group. Epididymo-orchitis is common in young and middle age groups where as fournier's gangrene was common in elderly age groups. USG colour Doppler should be done in all cases except

in clinically obvious cases of Fournier's gangrene. Conservative management is the main stay of treatment in the case of epididymo-orchitis. Thorough debridement followed later by graft cover or secondary suturing is effective treatment in case of Fournier's gangrene.

KEYWORDS: Acute Scrotum, Torsion Testis, Epididymo Orchitis, Fournier Gangrene

INTRODUCTION

Acute scrotum¹ is defined as, "the acute onset of pain and swelling of the scrotum that requires either emergency surgical intervention or specific medical therapy."

Like acute abdomen to a general surgeon, acute scrotum is for a urologist.

Several acute scrotal conditions can present in similar way, testicular torsion is by far the most significant. Testicular torsion is a true surgical emergency because, the likelihood of testicular salvage decreases, as the duration of torsion increases.

Other conditions that presents in similar way to testicular torsion include, torsion of appendix testis, epididymo-orchitis, trauma to testis, haematocele, strangulated inguinal hernia, Henoch-Schonlein purpura etc.

Disease primarily located elsewhere can present with signs and symptoms in the scrotum. Examples are haemoperitoneum and meconium peritonitis. Similarly, a torsion testis can present with abdominal pain, nausea and vomiting. This suggests that scrotum cannot be looked upon as an area isolated from the rest of the body.

In most of the patients it should be possible to establish a reasonably accurate diagnosis based on detailed history and physical examination combined with the appropriate use of imaging studies.

A variety of investigations have been described in the management of acute scrotal conditions. These include an array of tests from a simple urine examination to more sophisticated forms like ultrasonography, Doppler studies and radionucleotide scanning. In case of epididymo-orchitis conservative approach yields good results and prevents complications.

But ultimately for acute scrotum scrotal exploration remains as gold standard approach.

AIMS AND OBJECTIVES

Aim:

To study clinical presentation, differential diagnosis and management of acute scrotum.

Objectives:

1. To study the differential diagnosis for common causes of acute scrotum
2. To study clinical presentation and management of different acute scrotal conditions.

PATIENTS AND METHODS

Study design : Prospective study

Study setting : Department of general surgery

Government General Hospital, Kadapa.

Study period : 2 year from 22nd december 2018 to 21st december 2020.

Study methods: 100 patients with acute scrotum will be included in the study. At admission i will record the data of all patients, take informed consent and consent of parents in case of children and further subject the case for immediate needful management .with this i will evaluate the case as per protocol till the patient is discharged.

Statistics : Results are expressed in percentages and mean.

A) Inclusion criteria

- 1) All patients with complaints of acute pain and swelling in the scrotum between 13-80 years of age were included in the study.
- 2) Patients willing to participate in study.

B) Exclusion criteria

- 1) patients with painless scrotal swellings.
- 2) patients with chronic scrotal pain.

Ethical Consideration :

Institutional review board of research studies and Independent Ethics Committee (IEC) reviewed this study protocol and ethical clearance was obtained (Reg. No.

M187210092). Informed written consent was obtained from all the study participants after thoroughly explaining the study protocol, benefits and risks. Confidentiality of the study participants was maintained throughout the study.

OBSERVATIONS AND RESULTS

The present study was conducted at Government General hospital Kadapa for a period of 2 year from 22nd december 2018 to 21st december 2020. 100 patients satisfying the inclusion criteria were taken for the study. The following are the results and observations.

TABLE-1 : DISTRIBUTION OF CASES

DIAGNOSIS	NUMBER	PERCENTAGE
Epididymo-orchitis	35	35
Fournier's gangrene	30	30
Pyocele	16	16
Haematoma	10	10
Testicular torsion	8	8
Scrotal wall abscess	1	1
Total	100	100

In present study most common condition is epididymo-orchitis with 35 cases(35%) followed by fournier's gangrene30(30%), Pyocele16(16%), haematoma 10(10%), torsion 8(8%) and scrotal wall abscess 1(1%).

TABLE-2 : AGE DISTRIBUTION

AGE GROUP	EPIDIDYMO-ORCHITIS (n=35)	FOURNIER'S GANGRENE (n=30)	PYOCELE (n=16)	HAEMATOMA (n=10)	TESTICULAR TORSION (n=8)	SCROTAL WALL ABSCESS (n=1)	TOTAL (n=100)
13-20	1(2.85%)	0	0	0	4(50%)	0	5(5%)
21-30	15(42.85%)	1(3.33%)	0	2(20%)	3(37.5%)	0	21(21%)
31-40	8(22.85%)	1(3.33%)	3(18.75%)	7(70%)	1(12.5%)	0	20(20%)
41-50	8(22.85%)	12(40%)	7(43.5%)	1(10%)	0	0	28(28%)
51-60	1(2.85%)	8(26.66%)	4(25%)	0	0	1(100%)	14(14%)
61-70	1(2.85%)	3(10%)	2(12.5%)	0	0	0	6(6%)
>70	1(2.85%)	5(16.66%)	0	0	0	0	6(6%)

Torsion is common in younger patients. Epididymo-orchitis and Fournier's gangrene are common in middle and elder age groups respectively. Epididymo-orchitis was more common in the 21-30 years age group (42.85%). Out of 100 cases in the present study, 28(28%) cases (maximum number of cases) are in 41-50 years age group. Next to this 21(21%) cases are in 21-30 years age group.

TABLE -3 : INCIDENCE OF OCCUPATION

OCCUPATION	EPIDIDYMO-ORCHITIS (n=35)	FOURNIER'S GANGRENE (n=30)	PYOCELE (n=16)	HAEMATOMA (n=10)	TESTICULAR TORSION (n=8)	SCROTAL WALL ABSCESS (n=1)	TOTAL (n=100)
MANUAL LABOURER (agricultural, coolie, driver, porter etc.,)	20(57.14%)	23(76.66%)	13(81.25%)	6(60%)	2(25%)	1(100%)	65(65%)
SEDENTARY (officers, students, software, etc.,)	15(42.85%)	7(23.33%)	3(18.75%)	4(40%)	6(75%)	0	35(35%)

Acute scrotum is common in manual labourers i.e., people who are involved in strenuous work like agricultural labourers, coolies, porters etc. In the present study out of 100 patients, 65 patients are manual labourers (65%) and 35 patients (35%) have sedentary life style like students, officers, software job holders. Particularly Fournier's gangrene is more common in the manual labourers with 23 cases (76.66%). But testicular torsion is more common with sedentary life style with 6 cases (75%).

TABLE-4 : PRESENTING COMPLAINTS

	EPIDIDYMO-ORCHITIS (n=35)	FOURNIER'S GANGRENE (n=30)	PYOCELE (n=16)	HAEMATOMA (n=10)	TESTICULAR TORSION (n=8)	SCROTAL WALL ABSCESS (n=1)	TOTAL (n=100)
SWELLING	35(100%)	30(100%)	16(100%)	10(100%)	8(100%)	1(100%)	100(100%)
PAIN	35(100%)	30(100%)	16(100%)	10(100%)	8(100%)	1(100%)	100(100%)
FEVER	15(42.85%)	16(53.33%)	16(100%)	8(80%)	8(100%)	1(100%)	64(64%)
BURNING MICTURITION	2(5.71%)	6(20%)	3(18.75%)	0	0	0	11(11%)
TRAUMA	2(5.71%)	0	0	10(100%)	0	0	12(12%)

Symptom wise pain and swelling were the presenting complaints in all the patients involved in the study. Fever was present in 64 cases(64%),burning micturition was present in 11cases (11%) and trauma in 12 cases(12%). Fever was present in all cases of Pyocele, torsion, scrotal wall abscess (100%) and in 8 cases of haematoma(80%),16 cases of fournier's gangrene(53.33%) and 15 cases of epididymo-orchitis(42.85%). Burning micturition was present in 11 cases(11%). Burning micturition was present in 6 cases(20%) of fournier's gangrene,3 cases(18.75%)of Pyocele and 2 cases(5.71%) of epididymo-orchitis. History of trauma is present in all cases of haematoma(100%) and in 2 cases of epididymo-orchitis(2%).

TABLE-5 : DURATION OF SYMPTOMS

TIME	EPIDIDYMO-ORCHITIS (n=35)	FOURNIER'S GANGRENE (n=30)	PYOCELE (n=16)	HAEMATOMA (n=10)	TESTICULAR TORSION (n=8)	SCROTAL WALL ABSCESS (n=1)	TOTAL (n=100)
< 6 HRS	0	0	0	0	1(12.5%)	0	1(1%)
6-23 HRS	0	0	0	2(20%)	4(50%)	0	6(6%)
1-2 DAYS	21(60%)	0	2(12.5%)	8(80%)	3(37.5%)	1(100%)	35(35%)
3-4 DAYS	10(28.57%)	19(63.33%)	5(31.25%)	0	0	0	34(34%)
5-6 DAYS	3(8.57%)	9(30%)	5(31.25%)	0	0	0	17(17%)
>=7 DAYS	1(2.85%)	2(6.66%)	4(25%)	0	0	0	7(7%)

Most of the patients of torsion and some cases of trauma presented to casualty within few hours whereas other conditions presented within 1-8 days after onset of the symptoms. 50% of testicular torsion patients came to casualty between 6-23 hours after onset of symptoms. Majority of the fournier's gangrene patients 19(63.33%) present to casualty 3-4 days after the onset of symptoms. Overall most of the patients of acute scrotum 35(35%) in the present study have symptom duration of 1-2 days. 34 cases(34%) present to the casualty between 3-4 days after the onset of symptoms.

TABLE –6 : DISTRIBUTION OF SYMPTOMS IN CASES

SIDE	EPIDIDYMO-ORCHITIS (n=35)	FOURNIER'S GANGRENE (n=30)	PYOCELE (n=16)	HAEMATOMA (n=10)	TESTICULAR TORSION (n=8)	SCROTAL WALL ABSCESS (n=1)	TOTAL (n=100)
RIGHT	17(48.57%)	0	7(43.75%)	3(30%)	4(50%)	0	31(31%)
LEFT	15(42.85%)	0	9(56.25%)	5(50%)	4(50%)	1(100%)	34(34%)
BILATERAL	3(8.57%)	30(100%)	0	2(20%)	0	0	35(35%)

Fournier's gangrene was bilateral in all cases(100%). In epididymo-orchitis 17 cases were on right side, 15 on left and in 3 cases there was bilateral involvement. In pyocele 7 cases were on right side and 9 on left side. In haematoma 3 cases were on right side, 5 cases were on left side and in 2 cases there is bilateral involvement. Torsion was distributed equally on both sides. Scrotal wall abscess was present on left side.

TABLE-7 : DIABETES MELLITUS

	EPIDIDYMO-ORCHITIS (n=35)	FOURNIER'S GANGRENE (n=30)	PYOCELE (n=16)	HAEMATOMA (n=10)	TESTICULAR TORSION (n=8)	SCROTAL WALL ABSCESS (n=1)	TOTAL
DIABETES	5(14.28%)	9(30%)	3(18.75%)	0	0	0	17(17%)

Out of 100 cases diabetes was predisposing factor in 17 cases(17%). It was present in 9 cases(30%) of Fournier's gangrene, 3 cases(18.7%) of Pyocele and in 5 cases(14.28%) of epididymo-orchitis. Diabetes was not present in patients with haematoma, testicular torsion and scrotal wall abscess.

TABLE-8 : SIGNS IN ACUTE SCROTUM

	EPIDIDYMO-ORCHITIS (n=35)	FOURNIER'S GANGRENE (n=30)	PYOCELE (n=16)	HAEMATOMA (n=10)	TESTICULAR TORSION (n=8)	SCROTAL WALL ABSCESS (n=1)

CREMASTERIC REFLEX(present)	35(100%)	NOT ELICITED	16(100%)	10(100%)	0	NOT ELICITED
PREHN'S SIGN(present)	35(100%)	NOT ELICITED	16(100%)	10(100%)	0	NOT ELICITED

Cremasteric reflex and prehn's sign were absent in all cases of testicular torsion. They were not elicited in fournier's gangrene and scrotal wall abscess. They were present in rest of all cases.

TABLE-9 :VASCULARITY OF TESTIS ON DOPPLER

VASCULARITY	EPIDIDYMO-ORCHITIS (n=35)	FOURNIER'S GANGRENE (n=30)	PYOCELE (n=16)	HAEMATOMA (n=10)	TESTICULAR TORSION (n=8)	SCROTAL WALLABSCESS (n=1)	TOTAL (n=100)
NORMAL	0	0	8(50%)	8(80%)	0	1(100%)	17(17%)
ABSENT	0	0	8(50%)	2(20%)	8(100%)	0	18(18%)
INCREASED	35(100%)	0	0	0	0	0	35(35%)
NOT DONE	0	30(100%)	0	0	0	0	30(30%)

On Doppler vascularity was absent in all cases of torsion (100%) and increased in all cases of epididymo-orchitis (100%). Vascularity was absent in half of the cases of Pyocele(50%) and 2 cases(20%) of haematoma. In 17 cases it is normal (17%). It was not done in fournier's gangrene as all cases were clinically obvious.

TABLE -10 : TREATMENT GIVEN FOR DIFFERENT CASES

TREATMENT	EPIDIDYMO-ORCHITIS (n=35)	FOURNIER'S GANGRENE (n=30)	PYOCELE (n=16)	HAEMATOMA (n=10)	TESTICULAR TORSION (n=8)	SCROTAL WALLABSCESS (n=1)	TOTAL (n=100)

CONSERVATIVE	35(100%)	0	0	0	0	0	35(35%)
DEBRIDEMENT	0	30(100%)	0	0	0	0	30(30%)
ORCHIDECTOMY UNILATERAL	0	0	8(50%)	2(20%)	0	0	10(10%)
EXPLORATION AND EVACUATION OF HAEMATOMA	0	0	0	8(80%)	0	0	8(8%)
UNILATERAL ORCHIDECTOMY & CONTRALATERAL ORCHIDOPEXY	0	0	0	0	6(75%)	0	6(6%)
BILATERAL ORCHIDOPEXY	0	0	0	0	2(25%)	0	2(2%)
INCISION AND DRAINAGE	0	0	8(50%)	0	0	1(100%)	9(9%)

All cases of epididymo-orchitis were treated conservatively with antibiotics, analgesics and scrotal support. All the patients recovered well and were discharged within a week. All cases of fournier's gangrene underwent meticulous debridement followed by secondary suturing in 8 patients and split thickness skin grafting in 22 patients. 8 cases of pyocele underwent unilateral orchidectomy and other 8 cases were treated by incision and drainage.

8 cases of haematoma were treated by exploration and evacuation and 2 cases were treated by orchidectomy because of non viability of the testis on the affected side. 6 cases of testicular torsion underwent unilateral orchidectomy and contralateral orchidopexy. 2 cases underwent bilateral orchidopexy. Scrotal wall abscess was treated by incision and drainage.

DISCUSSION

TABLE -11 : COMPARISION WITH OTHER STUDIES

STUDY	EPIDIDYMO-ORCHITIS	FOURNIER'S GANGRENE	PYOCELE	HAEMATOMA	TESTICULAR TORSION	SCROTAL WALL ABSCESS
V. Shashikanth et al ²	33.30%	13.3%	13.3%	10%	21.70%	3.40%
Cass et al ³	72.50%	-	-	-	20.67%	-
N. H. Moharib et al., ⁴	8.92%				33.92%	
Present study	35%	30%	16%	10%	8%	1%

V. Shashikanth et al⁵, study showed acute epididymo-orchitis was the commonest cause for acute scrotum accounting for 33.3% of total cases, followed by torsion of testis which accounted for 21.7%, Fournier's gangrene (13.3%), Pyocele (13.3%), hematocele (10%), Torsion of appendix of testis (5%), scrotal wall abscess (3.4%).

A case study by **Cass et al.,³** showed the incidence of epididymitis of about 72.5% when compared to torsion of testis which was about 20.67%.

Another study conducted by **N. H. Moharib et al.,⁴** showed that testicular torsion (33.92%) was the most common cause for acute scrotal pathology followed by epididymitis which accounted for 8.92%.

TABLE -12 : EPIDIDYMO-ORCHITIS INCIDENCE IN OTHER STUDIES

STUDY	EPIDIDYMO-ORCHITIS
V. Shashikanth et al²	33.30%
N. H. Moharib et al⁴	8.92%
N. A. Watkin et al⁶	15%
Cass et al³	72.50%
PRESENT STUDY	35%

The study by **N. A. Watkin et al.**,³ showed that torsion of the testis was the most frequent cause (39.5%) followed by torsion of appendages of testis/epididymis which was found to be 29% of the cases and 15% of the patients had epididymo- orchitis. The rest of the cases were haematocele, pyocele which was about 16%. In the present study there are 35 cases of epididymo-orchitis(35%),30 cases of fournier's gangrene(30%),16 cases of Pyocele(16%),10 cases of haematoma(10%),8 cases of testicular torsion(8%) and 1 case of scrotal wall abscess(1%).

This study is in par with studies conducted by **V. Shashikanth et al.**,⁹ **Cass et al.**,³² in having epididymo-orchitis as the leading cause of acute scrotum.

But it differs from studies by **N. H. Moharib et al.**,⁴ **N. A. Watkin et al.**,⁶ as they have testicular torsion as the leading cause of acute scrotum.

In the present study of the total 100 patients, most of the patients were of younger and middle age groups. Majority of the cases were between 21-40 years(41%),41-50(28%).

In the study conducted by **Thorsteinn et al.**,⁷ the shortest duration of symptoms was 3 hours and the longest was 21 days whereas, **in present study** shortest duration of symptoms was 4 hours and longest duration was 8 days.

It was not possible to diagnose all cases of acute scrotum just by clinical profile because in majority of conditions of acute scrotum there is overlapping of symptoms and similarity between the presentations.

This is in par with the studies conducted by **Murphy et al** ⁸, and **Sidler et al**⁹.

The symptoms pain and swelling are present in all cases of present study. The presence of Pain as common presenting symptom was in par with the study conducted by **Ibrahim et al**¹⁰.

Kass et al.,¹¹ studied 77 cases and found that there is no necessity for routine surgical exploration of all with acute scrotum. But in one-third of cases, the differential diagnosis of acute scrotum by history and physical examination is difficult and requires a rapid diagnostic

tool.

In the present study, all the patients underwent ultrasonography except cases of Fournier's gangrene.

Agrawal AM et al.,¹² showed in their study that colour Doppler had 100% sensitivity and specificity and 100% PPV and NPV in diagnosing torsion testis. In another study by **Yagil Y et al.,¹³** sensitivity was 94% and specificity was 96% and PPV and NPV was 89.4% and 98% respectively.

In present study sensitivity, specificity, PPV and NPV are 100%. All cases were diagnosed correctly by sonography and colour Doppler.

TABLE-13 : COLOUR DOPPLER FOR TORSION

Color Doppler for Torsion	Sensitivity	Specificity	PPV	NPV
Agrawal AM et al.,¹²	100%	100%	100%	100%
Yagil Y et al.,¹³	94%	96%	89.40%	98%
Present study	100%	100%	100%	100%

High frequency real time sonography is 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.

Khaleghnezhad-Tabari and Baghaeipouret al¹⁴ In their studies of over 83 children found that testicular torsion occurred in 37% and appendage torsion in 17%. In the first study, orchidectomy was done in 10 cases (32%) and testicular appendectomy in 14 cases (17%). Of those cases, 80% presented more than 8 hours after the onset of symptoms. The testis preservation rate was 68%, while it was 25% in our study. In the **present study** out of 100 cases, 35 cases (35%) were managed conservatively, all were diagnosed to have epididymo-orchitis. All the other 65 cases (65%) were managed surgically.

Most of the patients who were treated surgically had uneventful postoperative period except in one case (haematoma) where wound infection occurred.

Duration of hospital stay was longer in cases of Fournier's gangrene when compared to other conditions. All patients were followed up for 1- 6 months. None of them had any complications after getting discharged from the hospital.

According to a study conducted by **Street et al¹⁵** early diagnosis and management are essential, in epididymo-orchitis as serious complications can occur like abscess formation, testicular infarction and infertility. Recent epidemiological evidence suggests that selection of fluoroquinolone antibiotics with anti-Chlamydial activity is more appropriate in the management of sexually active men in the over 35 years age group.

In present study, all patients of epididymo-orchitis recovered well from conservative treatment of antibiotics, analgesics, scrotal support and bed rest and discharged within 7- 10 days. None of them developed complications. It concludes that prompt treatment of acute epididymo-orchitis prevents complications.

Kelalis PP et al¹⁶(1976) study, an acute disorder of the scrotum in a child without previous urologic history must be viewed as torsion until proved otherwise by surgical exploration. No deleterious effects have been reported from such an approach, which requires a minimal period of hospitalization and little discomfort to the child. The shorter the interval between the onset of symptoms and surgical exploration, the greater the likelihood that the testicle will be viable later.

The diagnosis of epididymo-orchitis in a healthy child without a history of urologic abnormality or evidence of lower urinary tract infection has no place in the differential diagnosis of the child with the painful scrotum.

Fournier's gangrene is a type of necrotising fasciitis around scrotum and perineum. Because of its aggressive nature, patients should be treated with broad- spectrum antibiotics and emergency radical debridement during the acute phase. After recovering from the acute

phase, reconstruction of the scrotal and perineal soft tissue defects is needed and is often challenging.

Traditionally, various reconstruction methods have been used, including skin grafts, fascio-cutaneous flaps and musculo-cutaneous flaps, each with its pros and cons.

Han HH et al¹⁷ covered a wide scrotal defect using a superficial circumflex iliac artery perforator flap, which has not been previously reported for this indication.

Prehn's sign, cremastic reflex helps in differentiating torsion from epididymo-orchitis clinically. However USG colour Doppler is the best investigation to differentiate between the two.

Dakum and coworkers¹⁸ showed only four patients(13.9%) presented within the first 24 hours of illness (all explored within 6 hours) and 14 patients(48.3%) in 1-5 days. Thirteen patients(44.6%) underwent orchidopexy while 7 (24.2%) patients underwent orchidectomy due to testicular torsion (five) and intrascrotal abscesses (two). All cases of epididymo-orchitis managed conservatively with antibiotics responded well to the treatment.

Testicular salvage rate was 72% in patients with testicular torsion which differs from present study 25%. In the present study 5 patients presented within first 24 hours and out of them only 1 patient presented within 4 hours. Testicular salvage was possible only in 2 patients who presented early(4hrs,7hrs). Orchidectomy was done in rest of the patients on the affected side and orchidopexy was done on contralateral side to prevent future torsion.

Testicular torsion is often a challenging diagnosis to make, yet it is one that must be actively excluded in every presentation of acute scrotal pain¹⁹. It would be prudent to consider torsion in any patient that presents with one or more of nausea and vomiting, acute scrotal pain of less than 24 hours, a high position of the testis or an abnormal cremasteric reflex.

"Intermittent" testicular torsion is a well recognized entity in which a classic torsion history is obtained, but physical examination and ultrasound findings are normal. In such

cases, it is reasonable to offer an elective bilateral scrotal orchidopexy for the possibility of intermittent symptoms becoming full fledged torsion.

Individually, clinical features are not effective enough in identifying testicular torsion. Because most of the features are also present in other conditions of acute scrotum.

Sometimes in case of torsion of appendages conservative management can be followed if testicular torsion is ruled out successfully.

In the present study all Pyocele cases i.e., collection of pus between the layers of tunica vaginalis were treated by either incision and drainage or orchidectomy if there is absence of vascularity to the testis on USG colour Doppler study.

Oberlin DT et al²⁰ have done percutaneous aspiration for pyocele in a 12 dayold full term boy and treated it successfully. The study concludes that percutaneous image guided aspiration as an effective management for pediatric pyocele in selected cases as it can be performed under local anaesthesia and it avoids the risks of general anaesthesia and scrotal exploration.

Rare causes of acute scrotum like Henoch-schonlein purpura, torsion of testicular/epididymal appendages, etc., were not encountered in the present study.

Other scrotal conditions that are chronic in nature can also present with acute symptoms and include testicular neoplasms, spermatocele and hydrocele. In the case of testis tumors, patients may only become aware of the mass after it has been present for many months, after it affects the appearance of the scrotum. However, testicular tumors can present precipitously if they undergo hemorrhage or necrosis, and produce swelling, pain and soreness. In this case, a scrotal physical examination reveals a firm, intratesticular mass and scrotal ultrasound demonstrates a solid intratesticular mass which has a > 90% likelihood of being a germ cell tumor.

The suspicion of tumor is important for the approach to exploratory surgery in the acute scrotum, as the correct surgical approach to testicular cancer is through an inguinal incision and not transscrotally. In addition, the testis and its investments are dissected out intact, to minimize tumor spillage during surgery and spermatic cord ligation is done in the inguinal region to further contain the spread of cancer.

Other chronic scrotal lesions which can present acutely include hydroceles (increased fluid within the tunical vaginalis space) and spermatoceles (cystic dilation of the fine ducts that lead from the rete testis to the epididymal head) that hemorrhage after trauma, or become infected.

In addition, a scrotal varicocele, a condition characterized by dilated pampiniform plexus veins and that occurs in 15% of men at puberty, can be present for years but become acutely symptomatic. These dilated veins surround the spermatic cord.

If the varicocele has acute onset, is only right-sided, or persists in the supine position, then inferior vena caval (IVC) obstruction must be excluded (i.e., IVC thrombus, abdominal mass, etc).

No conclusions can be made regarding the rare causes of scrotum as they were not encountered in the study. A careful history, physical examination and ultrasound examination is usually sufficient to diagnose these usually benign acute or chronic events. Urgent surgical intervention is rarely needed for drainage of a loculated infection or for a persistent hemorrhage associated with hydroceles or spermatoceles.

In general, scrotal exploration is a procedure of low morbidity. A negative exploration seldom results in long term complications.

When weighing conservative treatment with the loss of a potentially salvageable testis, it is best to err on the side of exploration. In cases of "late torsion" or "established torsion" exploration generally reveals a hemorrhagic, frankly necrotic testis for which

orchidectomy should be performed.

Once the diagnosis of acute scrotum is made, it can be treated either surgically or conservatively depending on the condition. The difficulty lies in use of history taking, clinical examination and investigations in a short interval of time to arrive at a final diagnosis .No single feature is pathognomic of acute scrotum.Because often in most of the cases there is overlapping of the symptoms.

So the triad of history taking, clinical examination and investigations plays a key role in the diagnosis of acute scrotum.

LIMITATIONS OF THE STUDY

- The present study does not represent a large group of population as the study was conducted at the tertiary care hospital and it includes limited sections of people.
- Subjects of Age group less than 13 years were not included in the study.
- Rare causes of acute scrotum like Henoch-schonlein purpura, torsion of appendages, mumps orchitis etc., were not encountered.

CONCLUSION

- Acute scrotum is a common condition encountered in casualty with most common cause being epididymo-orchitis.
- Torsion is common in younger age group. Epididymo-orchitis is common in young and middle age groups where as fournier's gangrene was common in elderly age groups.
- USG colour Doppler should be done in all cases except in clinically obvious cases of Fournier's gangrene.
- Conservative management is the main stay of treatment in the case of epididymo-

orchitis. Thorough debridement followed later by graft cover or secondary suturing is effective treatment in case of Fournier's gangrene.

- Testicular salvage can be done in case of torsion if the presenting duration is less than 6 hours. Early exploration is gold standard treatment for torsion.
- In case of doubtful diagnosis of acute scrotum emergency exploration is better as it helps in testicular salvage.

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