



## Study of Clinical Profile and Management of Patient with Tender Testis at Tertiary Care Hospital

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### ABSTRACT

**Background:** Testicular tenderness is a common yet critical symptom that can indicate conditions ranging from benign inflammation to surgical emergencies such as testicular torsion. Early diagnosis and appropriate management are essential to prevent complications like infertility, abscess formation, or testicular loss. This study aimed to evaluate the clinical profile, etiologies, and management outcomes among patients presenting with tender testis at a tertiary care hospital.

**Methods:** A prospective observational study was conducted in the Department of General Surgery, C.U. Shah Medical College and Hospital, Surendranagar, from September 2023 to September 2024. Fifty male patients presenting with testicular pain and tenderness were enrolled based on defined inclusion and exclusion criteria. Detailed clinical evaluation, laboratory tests (CBC, CRP), and scrotal ultrasound with Doppler were performed. Patients were managed either medically or surgically, depending on the underlying etiology. Data were analyzed using SPSS version 26.0, with Chi-square test applied to determine associations between diagnosis, management, and hospitalization status.

**Results:** The majority of patients (56%) were  $\leq 40$  years old, and right-sided involvement (58%) predominated. Elevated WBC counts ( $>10,000$  cells/mm<sup>3</sup>) were observed in 82%, and raised CRP levels ( $>10$  mg/L) in 74%. Epididymo-orchitis was the most common diagnosis (62%), followed by testicular torsion (14%) and varicocele (8%). Medical management was required in 72% of cases, while 28% underwent surgery. Statistically significant associations were noted between diagnosis and management ( $p < 0.001$ ), and between diagnosis and hospitalization ( $p = 0.009$ ).

**Conclusion:** Epididymo-orchitis remains the leading cause of tender testis, managed primarily with conservative therapy, while torsion and abscesses require prompt surgical intervention. Early clinical assessment and Doppler imaging are pivotal for accurate diagnosis and improved testicular salvage.

**Keywords:** Tender testis, Epididymo-orchitis, Testicular torsion, Scrotal ultrasound, Surgical management.

### INTRODUCTION

Testicular tenderness represents a critical clinical symptom requiring prompt evaluation to differentiate between benign conditions and surgical emergencies. The testis plays vital roles in both reproductive function and endocrine regulation, making accurate diagnosis essential to prevent complications including infertility, chronic pain, or testicular loss.<sup>1</sup>

Testicular torsion constitutes the most critical cause of testicular tenderness and represents a true urological emergency. This condition involves twisting of the spermatic cord, leading to ischemia and potential necrosis. Classic features include acute onset of severe pain, high-riding testis, and absence of the cremasteric reflex.<sup>1</sup> While the cremasteric reflex absence has been reported in testicular torsion, it is not completely reliable as the reflex can occasionally persist despite confirmed torsion.<sup>2</sup> Testicular salvage rates are time-dependent, with studies showing 90.4% salvage within the first 12 hours, declining to 54% between 13-24 hours.<sup>3</sup> Immediate surgical exploration is recommended without delay for imaging, as early intervention significantly improves outcomes. Contralateral orchiopexy is performed concurrently to prevent future torsion.<sup>3</sup>

Epididymo-orchitis represents another common cause, typically presenting with more insidious onset of pain, scrotal erythema, and urinary symptoms.<sup>4</sup> In sexually active males under 35 years, Chlamydia trachomatis and Neisseria gonorrhoeae are the predominant pathogens, while Escherichia coli predominates in older adults.<sup>4,5</sup> Unlike testicular torsion, the cremasteric reflex remains intact, and Doppler ultrasound reveals increased blood flow. Management involves empirical antibiotic therapy with ceftriaxone and doxycycline for young males, along with analgesia and scrotal elevation.<sup>4</sup>

Testicular trauma may cause acute tenderness ranging from minor contusions to testicular rupture. Scrotal ultrasound is essential for assessing injury extent, with significant ruptures requiring surgical exploration to repair the tunica albuginea.

Torsion of testicular appendages mimics testicular torsion but is typically less severe and characterized by the "blue dot sign." This self-limiting condition requires only supportive care with analgesia and scrotal support.

A systematic approach incorporating detailed history, thorough physical examination, and judicious imaging allows accurate diagnosis.<sup>6</sup> Distinguishing emergent causes like testicular torsion from non-emergent conditions is crucial. While surgical emergencies demand immediate



action, infectious or minor traumatic causes can be managed conservatively. Maintaining high clinical suspicion and applying evidence-based management principles optimize patient outcomes and preserve testicular function.<sup>6</sup>

## MATERIALS AND METHODS

### Study Design and Setting:

This prospective observational study was conducted in the Department of General Surgery, C.U. Shah Medical College and Hospital, Surendranagar, a tertiary care teaching hospital with advanced diagnostic and surgical facilities. The study aimed to evaluate the clinical profile, etiologies, and management outcomes of patients presenting with tender testis.

### Study Duration:

The study was carried out over 12 months, from September 2023 to September 2024, ensuring comprehensive data collection and adequate follow-up.

### Study Population and Sampling:

All male patients presenting with testicular pain and tenderness in the Surgery OPD, IPD, or Casualty Department during the study period were considered. Consecutive sampling using a non-probability convenient method was adopted, appropriate for this observational hospital-based study.

### Sample Size:

A total of 50 patients were included, based on average patient inflow and comparable studies from tertiary centers, ensuring reliability and feasibility of follow-up.

### Inclusion Criteria:

- Patients with acute or subacute testicular pain and swelling.
- Those who underwent relevant investigations and management (medical or surgical).
- Patients providing informed written consent.

### Exclusion Criteria:

- History of testicular surgery within 6 months.
- Known testicular malignancy prior to presentation.
- Refusal to consent or incomplete clinical data.

### Study Methodology:

Eligible patients underwent thorough evaluation including detailed history, physical examination, and investigations such as CBC, CRP, and scrotal ultrasound with Doppler. Based on findings, patients were managed either medically (antibiotics, analgesics, scrotal support) or surgically (exploration, abscess drainage, or orchidectomy in cases of torsion, abscess, or trauma).

### Study Variables:

Recorded parameters included demographic data, laterality, addictions, comorbidities, WBC count, CRP, diagnosis, management modality, hospitalization status, surgical details, and hospital stay duration.

### Data Collection and Analysis:

Data were recorded using a structured Case Record Form documenting clinical, laboratory, and radiological findings, management, and outcomes. Data were compiled in Microsoft Excel and analyzed using SPSS version 26.0. Descriptive statistics (frequency, percentage) were applied to categorical variables, while Chi-square test assessed associations between diagnosis and management or hospitalization. A p-value < 0.05 was considered statistically significant.

### Ethical Considerations:

Institutional Ethics Committee approval was obtained [Ref. No. CUSMC/IEC(HR)/DI/53/2023/Final Approval/303/2023]. Written informed consent was taken from all participants after explaining study details. Confidentiality was maintained, participation was voluntary, and no additional financial or procedural burden was imposed. The study adhered to the Declaration of Helsinki and institutional ethical standards.

## RESULTS AND OBSERVATIONS

**Table 1:** Demographic and Clinical Characteristics (n = 50)

Parameter	Category	Frequency (n)	Percentage (%)
Age Group (years)	≤30	15	30 %
	31–40	13	26 %
	41–50	4	8 %
	51–60	5	10 %
	61–70	10	20 %
	71–80	3	6 %
	>80	0	0 %
Side of Tender Testis	Right	29	58 %
	Left	20	40 %
	Bilateral	1	2 %
Addiction Type	None	26	52 %
	Tobacco Chewing	13	26 %
	Bidi Smoking	11	22 %
Comorbidity	None	39	78 %
	Diabetes Mellitus	6	12 %
	Hypertension	3	6 %
	Benign Prostatic Hyperplasia	2	4 %

As shown in Table 1, the majority of patients (30 %) were ≤30 years old, followed by 26 % aged 31–40 years, suggesting higher incidence among young and middle-aged males. Right-sided involvement (58 %) predominated. More than half (52 %) reported no addictions, while 48 % had tobacco-related habits. Most patients (78 %) were free of



comorbidities; diabetes mellitus (12 %) was the leading associated condition.

**Table 2:** Laboratory Profile and Diagnosis Distribution

Parameter	Category	Frequency (n)	Percentage (%)
<b>WBC Count (cells/mm<sup>3</sup>)</b>	≤10 000	5	10 %
	10 001–15 000	27	54 %
	15 001–20 000	14	28 %
	>20 000	4	8 %
<b>CRP (mg/L)</b>	≤10	4	8 %
	11–30	19	38 %
	31–50	10	20 %
	>50	8	16 %
<b>Diagnosis</b>	Epididymoorchitis	31	62 %
	Testicular Torsion	7	14 %
	Varicocele	4	8 %
	Blunt Scrotal Trauma	3	6 %
	Testicular Abscess	2	4 %
	Scrotal Abscess	2	4 %
	Scrotal Wall Abscess	1	2 %

Table 2 demonstrates that 82 % of patients exhibited elevated WBC counts (>10 000 cells/mm<sup>3</sup>) and 74 % had raised CRP (>10 mg/L), confirming inflammatory or infective etiology. Epididymoorchitis constituted the majority (62 %), followed by testicular torsion (14 %) and varicocele (8 %). Abscesses together accounted for 10 %, emphasizing the dominance of infectious causes in tender-testis presentations.

**Table 3:** Management Pattern, Hospitalization, and Surgical Profile

Parameter	Category	Frequency (n)	Percentage (%)
<b>Type of Management</b>	Medical	36	72 %
	Surgical	14	28 %
<b>Hospitalization Status</b>	Hospitalized	26	52 %
	Not Hospitalized	24	48 %
<b>Type of Surgery (n = 14)</b>	Right Orchiectomy + Left Orchidopexy	4	28.6 %
	Incision and Drainage	3	21.4 %
	Bilateral Orchidopexy	3	21.4 %
	Left Orchiectomy	2	14.3 %
	Left Orchiectomy + Right Orchidopexy	1	7.1 %
	Scrotal Exploration + Left Orchiectomy + Right Orchidopexy	1	7.1 %
<b>Hospital Stay Duration</b>	≤3 Days	12	24 %
	4–6 Days	14	28 %
	>6 Days	0	0 %

Medical management predominated (72 %), mainly for epididymoorchitis and varicocele. Surgical intervention (28 %) was reserved for torsion and abscesses. Hospitalization was required in 52 %, mostly for acute or complicated cases. Right orchiectomy + left orchidopexy (28.6 %) was the most frequent procedure, followed by incision and drainage or bilateral orchidopexy (21.4 % each). Hospital stay was short in all cases (≤6 days), reflecting efficient management and favorable recovery.

**Table 4:** Association Between Diagnosis, Management Modality, and Hospitalization Status

Diagnosis	Management Modality		Hospitalization Status	
	Medical	Surgical	Not Hospitalized	Hospitalized
	n (%)	n (%)	n (%)	n (%)
Epididymoorchitis	30 (96.8 %)	1 (3.2 %)	18 (58.1 %)	13 (41.9 %)
Testicular Torsion	0 (0 %)	7 (100 %)	0 (0 %)	7 (100 %)
Varicocele	4 (100 %)	0 (0 %)	4 (100 %)	0 (0 %)
Blunt Scrotal Trauma	2 (66.7 %)	1 (33.3 %)	2 (66.7 %)	1 (33.3 %)
Testicular Abscess	0 (0 %)	2 (100 %)	0 (0 %)	2 (100 %)
Scrotal Abscess	0 (0 %)	2 (100 %)	0 (0 %)	2 (100 %)
Scrotal Wall Abscess	0 (0 %)	1 (100 %)	0 (0 %)	1 (100 %)
<b>Diagnosis vs Management: <math>\chi^2 = 37.27</math>, <math>p &lt; 0.001</math> (Highly significant)</b>				
<b>Diagnosis vs Hospitalization: <math>\chi^2 = 13.40</math>, <math>p = 0.009</math> (Significant)</b>				

A strong correlation exists between diagnosis and treatment strategy ( $p < 0.001$ ) as well as hospitalization status ( $p = 0.009$ ). Epididymoorchitis and varicocele were almost exclusively treated medically and often as outpatients. In contrast, testicular torsion and all abscesses required surgical intervention and inpatient management. Blunt trauma displayed a mixed approach depending on severity. These statistically significant associations underscore that

disease severity and etiology decisively influence both management modality and the need for hospitalization.

**DISCUSSION**

This prospective observational study provides valuable insights into the clinical profile, aetiologies, and management outcomes of 50 patients presenting with



tender testis at C.U. Shah Medical College and Hospital from September 2023 to September 2024.

The study cohort predominantly comprised younger and middle-aged individuals, with 30% (n=15) aged ≤30 years and 26% (n=13) aged 31–40 years. This aligns with the epidemiology of testicular tenderness, where conditions like testicular torsion and epididymo-orchitis are more prevalent in younger populations.<sup>4,7</sup> Epididymo-orchitis demonstrated a bimodal age distribution, with peak incidence occurring in men 16-30 years and 51-70 years of age.<sup>4</sup> The inclusion of older age groups (20% aged 61–70 years) reflects the broader spectrum of aetiologies, with urinary tract pathogens predominating in older men.<sup>7</sup>

Epididymo-orchitis emerged as the leading cause of tender testis (62%, n=31), consistent with the literature where it is the most common cause of acute scrotal pain in adults.<sup>4,8</sup> In sexually active males under 35 years, Chlamydia trachomatis and Neisseria gonorrhoeae account for approximately 50% of cases, while Escherichia coli predominates in older adults.<sup>[7,8]</sup> This distribution was reflected in the current study, with high rates of medical management (96.77%) for epididymo-orchitis.

Testicular torsion accounted for 14% of cases, all requiring surgical intervention. This prevalence is consistent with the bimodal age distribution of torsion, with peaks in the neonatal period and early adolescence (12-18 years).<sup>9,10</sup> The annual incidence of testicular torsion is approximately 3.8 per 100,000 males younger than 18 years, with an orchiectomy rate of 41.9% in boys undergoing surgery.<sup>9</sup> The lower incidence compared to epididymo-orchitis may reflect the broader age range and tertiary care setting of this study.

The diagnostic protocol relied heavily on scrotal ultrasound with Doppler, which is the gold standard for evaluating testicular pain.<sup>11,12</sup> Doppler ultrasound demonstrated high sensitivity (94-100%) and specificity (96-100%) for testicular torsion, with excellent positive and negative predictive values.<sup>12,13</sup> The elevated WBC counts (54% in 10,001-15,000 range) and CRP levels (38% in 11-30 mg/L) corroborated inflammatory aetiologies, consistent with previous studies.<sup>14</sup>

Management was predominantly medical (72%, n=36), reflecting the high prevalence of epididymo-orchitis and varicocele. Surgical intervention was reserved for testicular torsion (100%), abscesses (100%), and select trauma cases (33.33%), consistent with guidelines emphasizing urgent surgery for torsion.<sup>10,15</sup> The significant association between diagnosis and management ( $p < 0.001$ ) underscores the distinct treatment pathways. The high hospitalization rate for torsion and abscesses (100%) versus outpatient management for varicocele (100%) highlights the varying severity of conditions.

## CONCLUSION

In this prospective study of 50 patients with tender testis, epididymo-orchitis was the predominant diagnosis (62%), while testicular torsion and abscesses necessitated urgent surgery. Elevated WBC and CRP supported inflammatory etiologies. Most patients were young adults, right-sided involvement prevailed, and medical management succeeded in the majority (72%), whereas 28% required operative intervention. Significant associations between diagnosis and both management ( $p < 0.001$ ) and hospitalization ( $p = 0.009$ ) underscore the importance of rapid, accurate triage. Prompt clinical assessment and timely Doppler ultrasound facilitate appropriate treatment, improving testicular salvage and minimizing morbidity. Early antibiotics for infections and prompt surgical exploration for torsion improve outcomes markedly.

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