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Original Article

Testicular Salvage Rate among Patients with Testicular Torsion in Abuja, Nigeria

***Muftau Jimoh Bioku[1,4], Rahman Abiodun Nasiru[2], Ayoleke Ogunrinde[3], Amina Modupe Muhammed[1], Ahmed Saad[3,4]**

[1]Department of Surgery, Federal Medical Centre, Abuja, [2]Department of Surgery, Kubwa General Hospital, Abuja, [3]Department of Anatomic Pathology, Federal Medical Centre, Abuja, [4]Baze University

Abstract

Background: Testicular torsion (TT) represents a critical urological emergency characterized by the twisting of the spermatic cord necessitating immediate surgical intervention to prevent irreversible ischemic damage to the testis. The testicular salvage rate (TSR) is influenced by demographic, logistical, and institutional factors. However, there is a paucity of data on this subject in our setting. The study aims to determine the TSR among patients who had TT at Federal Medical Centre, Abuja, and to clinically review the presentations and outcomes of surgical intervention of this urologic emergency.

Methodology: We retrospectively reviewed the electronic medical records (EMRs) of all patients who had emergency scrotal exploration for testicular torsion between December 2022 and November 2025. The demographics, clinical presentation, intraoperative findings, procedures performed, and surgical outcomes were documented and analyzed.

Results: A total of 46 patients with TT had scrotal exploration within the study period. Their mean age was 20.3 ± 6.5 years, with an age range of 5- 39 years. The peak age group was 11-20 years. The right-to-left laterality ratio was 1.6: 1. No statistically significant difference was found in the monthly incidence of torsion. Only 13(28.3%) presented within the 6 hours of onset of symptoms, while long mesorchium was the most common anatomic predisposing factor identified (n=21, 45.7%). The commonest associated symptom was abdominal pain (32.6%). Of the 18 patients who had orchidectomy, 12 had ≥540-degree twist of their spermatic cords and gangrene of testes. The testicular salvage rate was 67.4%. Median hospital stay was 1 day (range 1-4 days)

Conclusion: Despite more than 70% of our patients presenting with delays, prompt surgical intervention achieved a salvage rate of 67.4%. Further research is necessary to investigate the long-term outcomes for patients post-salvage and evaluate the functional efficacy of the preserved tissue.

Keywords: Testicular torsion, salvage rate, orchidopexy, orchidectomy.

***Correspondence:** Dr. Bioku M.J, Urology Unit, Department of Surgery, Federal Medical Centre, Abuja, Email: mbioku@gmail.com

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Introduction

Testicular torsion is a urological emergency that occurs when the spermatic cord becomes twisted, impairing blood flow to the testis. This condition predominantly affects adolescents and young adults, resulting in severe pain and potentially irreversible damage if not urgently addressed [1]. The incidence of testicular torsion is estimated to be approximately 3 to 5 per 100,000 males per year, with the peak occurrence observed in individuals aged 12 to 18 years [2-4]. Delay in diagnosis and treatment can lead to testicular necrosis, with reports indicating that the likelihood of salvaging the affected testis diminishes significantly after 6 hours of symptom onset [5].

The testicular salvage rate (TSR) is a critical measure of clinical outcome following surgical intervention for testicular torsion. It quantifies the proportion of testes successfully retained through surgical procedures such as detorsion and/or orchidopexy [6]. Factors influencing TSR encompass demographic variables such as age and duration of symptoms, as well as logistical issues, including the accessibility of medical facilities and the timing of surgical intervention [7].

Despite the well-documented implications of testicular torsion, there remains a significant gap in the literature regarding the TSR within various geographic and institutional contexts, particularly in developing regions like Abuja, Nigeria. Studies in other settings have identified a range of TSR from as low as 31% to as high as 92%, reflecting disparities in healthcare access, public awareness, and the promptness of medical responses [3,4,8 -12]. As such, this study aims to evaluate the testicular salvage rates among patients with testicular torsion in Abuja, Nigeria, to provide critical data that could enhance clinical practices and improve outcomes for affected patients.

Methodology

This was a retrospective study conducted at the Federal Medical Centre, Abuja, on all patients who had emergency scrotal exploration for testicular torsion over three years from December 2022 to November 2025. Patients whose testicular torsion was not confirmed intra-operatively were excluded. The final cohort consisted of 46 patients.

The data were collected from the hospital's Electronic Medical Records (EMRs) system. We extracted relevant information, which included Demographics, Clinical Presentation, Duration of symptoms before presentation, clinical signs, and any relevant laboratory findings, intra-operative findings, details regarding the degree of testicular torsion, condition of the affected testis, presence of associated anatomical abnormalities, and any concomitant procedures performed, duration of the surgery, and any complications that arose during the procedure.

The diagnosis of testicular torsion was made clinically from a history of sudden onset of scrotal pain with or without associated symptoms and physical examination findings of tenderness in the hemiscrotum with or without Prehn's test, high-riding testis, or twisted spermatic cord. Emergency scrotal ultrasonography, urinalysis, full blood count, and viral screening were carried out. Doppler ultrasonography was not done in cases with a high index of suspicion, so as to reduce unnecessary delay to surgery.

Intra-operatively, torsed testes were detorsed and, if viable, fixed with nonabsorbable suture or excised if nonviable. The testicular viability was assessed by observing the return of pinkish coloration of the testis, arterial pulsation in the cord, and active bleeding on incision of the tunica albuginea. The contralateral testes were also fixed. We fixed the testicular tunica albuginea to the dartos fascia in three positions, upper and lower poles, as well as at the mid-point.

Typically, patients are discharged to the Urology clinic for follow-up one day after surgery.

In the data analysis, descriptive statistics were used to summarize the demographic and clinical characteristics of the patients. Continuous variables were reported as means with standard deviations, while categorical variables were presented as frequencies and percentages. Appropriate statistical tests were employed to compare groups, including age categories and the monthly frequency of torsion using Chi-square. A p-value of less than 0.05 was considered statistically significant. The testicular salvage rate was expressed as the percentage of testes preserved via detorsion and orchidopexy versus the total number of patients with testicular torsion.

Ethical approval was obtained from the Health Research Ethics Committee of the hospital before initiating data collection (FMCABJ/HREC/2026/302). Informed consent was waived due to the retrospective nature of the study, but patient confidentiality was strictly maintained throughout the research process.

Results

In this study, we evaluated a total of 46 patients diagnosed with testicular torsion who underwent scrotal exploration during the study period. The mean age of the cohort was 20.3 ± 6.5 years with an age range spanning from 5 to 39 years. Notably, the predominant age group affected was between 11 and 20 years, highlighting a critical demographic for awareness and preventive measures regarding this condition, as shown in Figure 1.

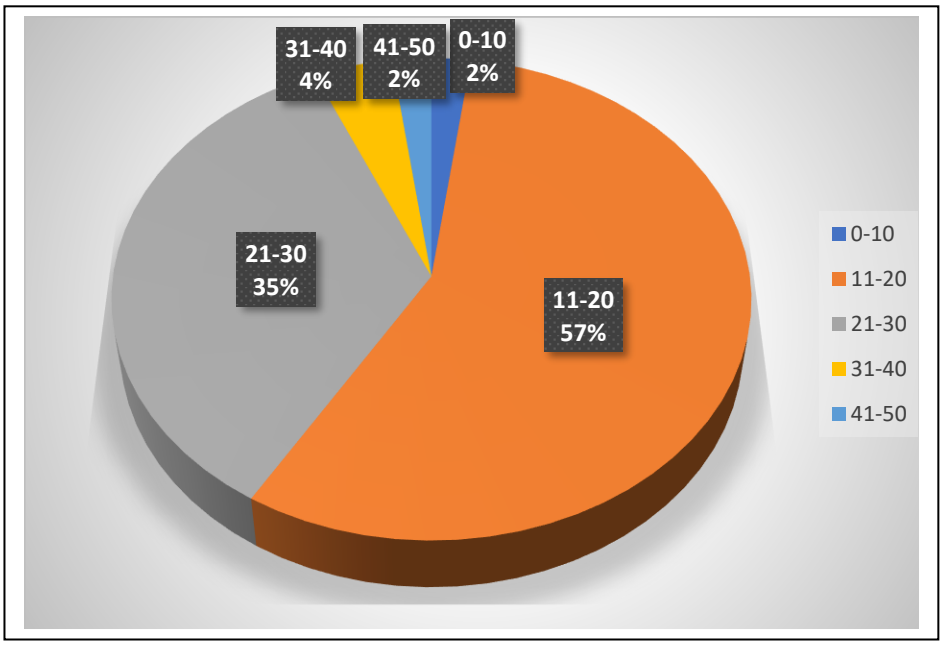

Figure 1: Bar chart depicting the frequency of testicular torsion in different age-group

Analysis of laterality revealed a right-to-left torsion ratio of 1.6:1, indicating a higher frequency of right-sided occurrences. The month of July emerged as the month with the highest incidence of testicular torsion incidents, although statistical analysis yielded no significant differences in the monthly distribution of cases throughout the year (p-value >0.05) (Figure 2).

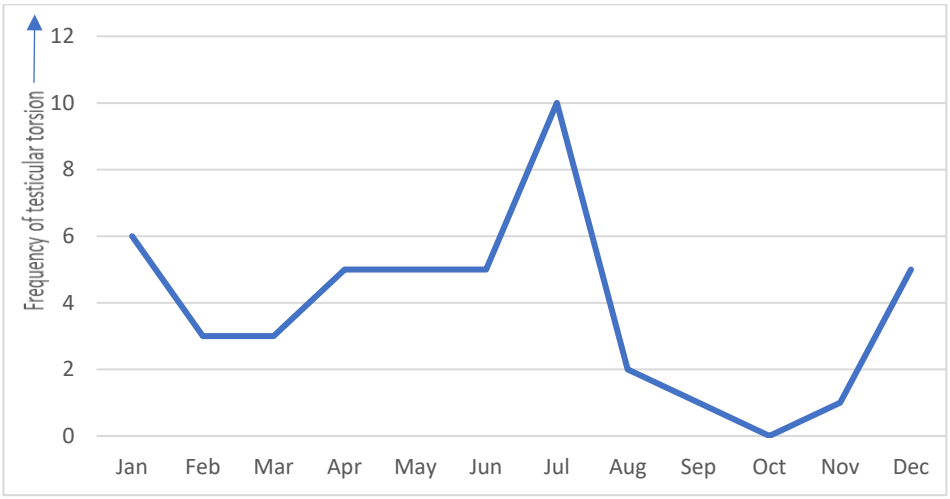

Figure 2: Line graph showing the monthly frequency of testicular torsion

Table 1 details the timing of presentation in the hospital; only 13 patients (28.3%) sought medical attention within the critical 6-hour window following the onset of symptoms, underscoring a significant delay in diagnosis. Aside from scrotal pain, which was present in all cases, the commonest associated symptom was abdominal pain reported in 32.6% of patients, followed by vomiting and nausea in 23.9% and (17.4%) of cases, respectively.

S/N	Time of presentation (Hours)	Frequency(n)
1	< 6	13
2	6-12	8
3	13-24	4
4	>24	18
5	Not documented	3
	TOTAL	46

Table 1: Showing the timing of presentation to the hospital

Anatomical predisposition was depicted in Table 2. We found out that long mesorchium was identified as the most common anatomic risk factor, present in 21 patients (45.7%), potentially contributing to increased susceptibility to torsion.

Anatomic intraoperative findings	Ipsilateral testis N (%)	Contralateral testis N (%)

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Long mesorchium	21 (45.6)	18 (39.1)
Transverse lie	12 (26.1)	9 (19.6)
Polar inversion	1 (2.2)	1 (2.2)
Clapper bell deformity	9 (19.6)	8 (17.4)
Not documented	3 (6.5)	10 (21.7)
TOTAL	46 (100)	46 (100)

Table 2: Testicular anatomic anomalies observed at surgery

All patients had operative intervention within 1.5 hours of presentation. Median hospital stay was 1 day (range 1-4 days). In terms of treatment outcomes, the overall testicular salvage rate in our cohort was observed to be 67.4%.

Discussion

Testicular torsion is a critical surgical emergency that requires prompt diagnosis and intervention to preserve testicular viability. In our study involving 46 patients, the mean age of 20.3 years, with a peak incidence in the 11–20-year age group, aligns with existing literature that commonly identifies adolescent and young adult males as the most affected demographic [3,4,13]. This is pertinent since the age group exhibits higher incidences due to anatomical variations and increased physical activity. Also, the rapid growth of the orchid and its attachments during puberty can lead to instability and twisting.

Our findings indicate a right-to-left laterality ratio of 1.6:1, which corroborates previous studies suggesting a propensity for right-sided torsion [14,15]. Conversely, some literature has reported a predominance of left-sided torsion [16 -18]. Additionally, July emerges as the month with the highest incidence of torsion, potentially correlating with seasonal patterns in physical activity among younger males. This time of the year often sees increased rates of trauma and vigorous exercise [19]. In the context of Abuja and its surrounding areas, July coincides with the peak of the rainy season, which is typically associated with cooler temperatures. This climatic condition may stimulate the cremasteric reflex, contributing to the risk of testicular torsion. However, it is important to note that conflicting evidence exists in other studies [20-22].

The primary anatomical risk factor identified in this study was a prolonged mesorchium, observed in 45.6% of cases, a finding that aligns with existing literature, which frequently attributes this anatomical variation to an increased susceptibility for testicular torsion [23]. The second most prevalent risk factor was a transverse lie, with an occurrence rate of 20.1%. Notably, the transverse lie has emerged as the most common anomaly in several studies [4,24,25]. The recognition of these risk factors underscores the imperative for the development and implementation of preventive strategies, as well as surgical interventions, for individuals identified as being at heightened risk.

Abdominal pain is the most frequently reported symptom associated with testicular torsion in our patients and holds significant clinical relevance, as it indicates that presentations may be atypical, thereby increasing the risk of misdiagnosis. This emphasizes the necessity for heightened awareness among healthcare professionals regarding the varied manifestations of testicular torsion. Other studies [15,17] have also confirmed the presence of gastrointestinal tract (GIT) symptoms in cases of testicular torsion. These GIT symptoms arise due to the innervation of the testes by the celiac plexus, which also supplies autonomic innervation to the duodenum, colon, liver, and pancreas.

A concerning observation from the study is that only 28.3% of patients sought surgical intervention within the critical 6-hour window following the onset of symptoms. The timing of presentation is crucial, as it significantly influences the testicular salvage rate. Research indicates that delays exceeding 6 hours markedly diminish the likelihood of preserving testicular function [26]. Within this cohort, an overall salvage rate of 67.4% was achieved. Our salvage rate exceeded that reported in studies conducted in Lagos [3,11], yet was inferior to findings from Ibadan [18] and Ebonyi [4], where salvage rates of 32%, 56.1%, 81.1%, and 87.1% were documented, respectively. Notably, an alarming statistic emerged: 13 out of 18 patients who underwent orchidectomy exhibited a spermatic cord twist of ≥540 degrees. Clinical researches [17,25,27,28] of acute testicular torsion in children have shown that the degree of twist is an important prognostic factor predicting testicular non-salvage with a twist of approximately **530 degrees** frequently used as a, or near, the cutoff value for predicting high-risk cases of non-salvageable testes.

Timely intervention is critical for enhancing the testicular salvage rate in cases of acute scrotal conditions. Urologists must prioritize the elevation of public awareness and health education to mitigate delays in hospital presentations and ensure expedited surgical interventions. This advocacy is particularly vital within educational institutions, where students should be informed about the potential consequences of postponing treatment for scrotal pain.

Furthermore, it is essential to provide comprehensive education for healthcare professionals across various hospital service points, including imaging units. These personnel should be trained to urgently refer adolescent patients exhibiting acute scrotal symptoms to urological surgeons, thus facilitating prompt operative intervention.

In addition to these educational and advocacy efforts, several institutional measures are crucial for improving testicular salvage rates. The establishment of a standardized protocol for immediate scrotal exploration in suspected torsion cases is necessary, along with the provision of rapid diagnostic capabilities within hospitals. The presence of functional operating theatres and the availability of ultrasound machines in all emergency departments should be regarded as fundamental requirements in this context.

Conclusion

The study emphasizes the critical role of timely diagnosis and intervention in the management of testicular torsion, which is essential for improving salvage rates and reducing complications. It is imperative to educate the community on recognizing the symptoms of testicular torsion and the importance of seeking immediate medical evaluation. Despite more than 70% of our patients presenting with delays, prompt surgical intervention achieved a salvage rate of 67.4%. Further research is necessary to investigate the long-term outcomes for patients post-salvage to evaluate the functional efficacy of the preserved testes.

Limitations

The retrospective design of this study may introduce selection bias, as the conclusions drawn are dependent on the completeness and accuracy of the electronic medical records (EMRs). Furthermore, given that the research was carried out at a single institution, the findings may have limited generalizability to other populations. Additionally, the study lacks a long-term follow-up regarding testicular function, which is typically assessed through hormonal profiles and fertility outcomes.

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