

A five-year review of presentation and management outcome of acute testicular torsion in two Nigerian referral centres

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Background: Acute testicular torsion (ATT) is a urological emergency that should be ruled out in patients presenting with acute testicular pain, particularly among teens and young adults. The aim of this study was to assess the pattern of presentation and management outcome of ATT in two Nigerian referral health facilities.

Methods: This was a retrospective study. Patients who were managed for ATT between January 2017 and December 2021 at the urology units of two hospitals in Nigeria were studied. During this period, 31 patients were treated for ATT. Twenty-two of them had complete medical records and were evaluated.

Results: The ages of the patients ranged from 12 to 30 years with a mean of 19.77 years. Approximately half of the patients ($n = 10$; 45.5%) presented after 24 hours of the onset of symptoms with the left testis being the most affected ($n = 17$; 77.3%). All patients presented with a history of testicular pain and had scrotal exploration. The intraoperative findings revealed a viable testis in 13 (59.1%) and nonviable testis in nine (40.9%) patients. Seven patients had a predisposing factor.

Conclusion: ATT is a time-dependent vascular accident commonly involving the left testis. Prior history of intermittent testicular pain is an important diagnostic marker in patients with equivocal clinical features. Immediate scrotal exploration, urgent testicular detorsion, and orchidopexy is the gold-standard treatment. Local anaesthesia is sufficient and time-saving. The testicular salvage rate is low due to delays in presentation and intervention.

Keywords: testicular torsion, testicular salvage, spermatic cord, scrotal exploration, urological emergency

Introduction

Acute testicular torsion (ATT) is a urological emergency involving the twisting of the spermatic cord on its axis.¹ Testicular torsion compromises testicular blood supply and may lead to testicular ischaemia and subsequent testicular loss if presentation and intervention are delayed.²

With a reported prevalence rate of one in 4 000 in males younger than 25 years, testicular torsion has been noted to have a bimodal incidence, with the first peak manifesting in the first year of life and the second peak occurring in adolescents aged 12–18 years.³

The aetiology of ATT is not clear. While torsion can occur in normal testis, it has been shown that individuals with cryptorchidism, bell clapper deformity, a transverse lie of the testis, and a rapid increase in testicular volume as seen in adolescents and in malignant diseases of the testes have a higher predisposition for the development of testicular torsion.^{1,2,4} Other documented predisposing factors include trauma, cold weather, sexual activity, sleep, and physical exertion.⁵⁻⁷

The clinical features of ATT range from scrotal pain of sudden onset, testicular swelling, nausea, vomiting to scrotal erythema, and a high riding testis.^{2,3,5} The diagnosis of testicular torsion is often clinical. Doppler ultrasound scan will, however, show decreased or absent testicular blood flow.¹ The surgical management of ATT entails scrotal exploration, detorsion, and orchidopexy or orchidectomy.^{2,4}

Late presentation to health facilities and delay in the surgical intervention is responsible for testicular infarction and loss.^{4,5} This study analyses the varied presentation, surgical management, and outcome of ATT in order to have an early presentation, timely intervention, and good outcome.

Materials and methods

This was a retrospective study of patients who had surgery for ATT between January 2017 and December 2021 at two referral centres in the north-central and south-south regions of Nigeria. Patients who had epididymo-orchitis and torsion of the testicular appendage were excluded from this study. The ward records, the urology clinics, and the operating theatre data were used to identify the patients. Thirty-four patients were managed for ATT in this period. Of these, 22 patients had complete records and these form the study population. Data on patients' age, clinical characteristics, type of anaesthesia, the operative procedure performed, the intraoperative findings, complications of the surgery, duration of hospital stay, and the postoperative outcomes were collected and analysed using Statistical Package for Social Sciences (SPSS version 22, SPSS Inc. Chicago IL, USA). The diagnosis of ATT was made clinically in 21 (95.5%) patients. One (4.5%) patient had testicular torsion diagnosed (or confirmed) using scrotal doppler ultrasound, while one (4.5%) patient had ATT diagnosed after an urgent scrotal ultrasound scan was done. All patients had either orchidopexy or orchidectomy in accordance with the testicular

viability. After detorsion, a pinkish testis with bright bleeding on pin prick showed a viable testis orchiopexy was done. A dark-coloured testis with absent bright bleeding after wrapping with warm saline-soaked gauze for 10 minutes was regarded as nonviable, and an orchidectomy was performed.

Results

A total of 22 out of 34 patients who had surgery for ATT had complete medical records and were included in this study. The age range was between 12 and 30 years with a mean age of 19.77 years (SD $\pm$ 5.18). Figure 1 depicts the frequency distribution of the age of the patients.

The majority of the patients (86.4%) were between 12 and 25 years of age (Table I).

Table I: Age distribution of the patients with acute testicular torsion

Age group (years)	Frequency (n)	Percentage (%)
10–15	6	27.3
16–20	7	31.8
21–25	6	27.3
26–30	3	13.6
Total	22	100

All patients had scrotal pain with accompanying scrotal swelling in five (22.5%) patients. Other associated symptoms were inguinal pain ($n = 7$; 31.8%), abdominal pain ($n = 3$; 13.6%), nausea/vomiting ($n = 2$; 9.0%), and trauma ($n = 1$; 4.5%). Eleven (50%) patients had a history of intermittent testicular pain of varying severity. Transverse lie of the testis ($n = 11$; 50.0%), high riding testis ($n = 10$; 45.5%) or a combination of both transverse lie and high riding testis ($n = 1$; 4.5%) were common clinical examination findings. The details of other history and examination findings are shown in Table II.

The diagnosis of ATT was clinically made in 21 (95.5%) patients, with urgent scrotal ultrasound scan done before diagnosis in only one (4.5%) patient. The majority of the patients presented late as only a few ($n = 3$; 13.6%) presented within six hours of onset of symptoms. In addition, some delay was also noted between the time of presentation and surgical intervention. Of the 22 patients, the vast majority (68.2%) had surgical intervention after two hours of presentation to the health facilities (Table III).

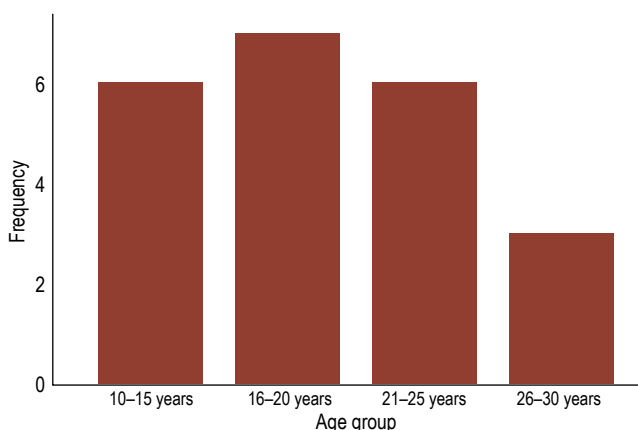


Figure 1: Frequency of testicular torsion in the various age groups

Table II: Some key history and examination findings of the patients

Variable	Subdivisions	Frequency (n)	Percentage (%)
Past history of testicular pain	No	11	50
	Yes	11	50
Site of torsion	Right	5	22.7
	Left	17	77.3
Examination findings	High riding testis	10	45.5
	Transverse lie	11	50.0
	High riding testis and transverse lie	1	4.5
Predisposing factors	Bell clapper deformity	3	13.6
	Long mesochium	3	13.6
	Undescended testis	1	4.5
	None	15	68.2

Table III: Time intervals of onset of symptoms to presentation, surgical intervention, and discharge, as well as intraoperative findings

Variable	Subdivisions	Frequency	Percentage
Duration of symptoms before presentation	< 6 hours	3	13.6
	6–12 hours	7	31.8
	13–24 hours	2	9.1
	25–36 hours	0	0
	37–48 hours	3	13.6
	3–4 days	3	13.6
Time between presentation and surgery	5–7 days	4	18.1
	< 2 hours	7	31.8
	2–4 hours	11	50.0
	5–6 hours	4	18.2
Intraoperative findings	Viable testis	13	59.1
	Nonviable testis	9	40.9
Duration of hospital stay	0–2 days	13	59.1
	3–5 days	9	40.9

Scrotal exploration was carried out for all the patients. Most of the patients ($n = 19$; 86.4%) had local anaesthesia administered. Two patients (9.1%) had surgery under general anaesthesia, while subarachnoid block was used in one patient (4.5%).

One of the patients had surgical site infection resulting in a longer hospital stay. The follow-up was poor as only 40% returned for follow-up after six weeks of discharge. No recurrent torsion was observed with testicular atrophy observed only in one patient.

Discussion

ATT is a common urological emergency that involves twisting of the spermatic cord with resultant loss of blood supply to the testis and subsequent testicular cord infarction.^{1,8} Testicular torsion is a preventable cause of testicular loss. In spite of this, the rate of testicular loss from torsion is still high in the West African sub-region due to delayed presentation, misdiagnosis, and delay in surgical intervention.^{9,10} This study looked at the varied patterns of presentation, clinical findings, and management outcomes of patients with ATT in two referral health facilities in Nigeria over a five-year period.

The mean age of 19.77 ($\pm$ 5.18) years in this study is basically similar to the mean age of 22.7 years reported by Ugwu et al.⁵ in the north-central and 22.6 years by Obi et al.⁴ in the southeastern region of

Nigeria. This mean age was, however, lower than the mean age of 27 years reported by Ugwumba et al.² The majority of the patients in this study (86.4%) were younger than 25 years of age with a peak incidence in the age group of 16–20 years. This finding of a single peak incidence is in tandem with the finding of Ugwumba et al.² who reported a similar peak incidence of 16–20 years. Obi et al.⁴ however, noted two peak age groups of 14–19 years and 20–25 years. The other peak incidence generally reported in the neonatal age group may not obtain for the West African patients as this study does not report any torsion in the first decade of life. This study however noted a sharp rise in the second decade of life and a gradual fall subsequently.

All patients in this study had testicular pain of sudden onset. This finding is in conformity with similar research works which report testicular pain as the commonest symptom in patients with ATT.^{1,4,9} Therefore, in patients with acute testicular pain, ATT should be considered the topmost differential diagnosis, especially in adolescents and young adults who are predominantly affected by this pathology. Atypical presentation such as isolated abdominal pain and genitourinary symptoms in patients with testicular torsion are typically very rare.^{11,12} Intermittent testicular pain was found in 11 (50%) patients. Obi et al.⁴ reported a prevalence of 48.4% and noted the importance of the past history of intermittent testicular torsion as a diagnostic tool in individuals with indeterminate clinical features. We suggest active surgical management of intermittent testicular torsion in order to reduce the high rate of testicular loss from ATT.

In this study, ATT was predominantly more on the left side ($n = 17$; 77.3%) than on the right side ($n = 5$; 22.7%). The majority of similar works in the West African sub-region reported similar findings of the left-sided prevalence of ATT.^{13,14} A handful, however, reported a right-sided preponderance.^{2,5} The predominance of testicular torsion on the left side has been ascribed to the anatomically longer length of the left spermatic cord making it more prone to torsion.⁴ The predisposing factors noted in this study include long mesorchium, undescended testes, and bell clapper deformity. The 31.8% prevalence of predisposing factors recorded in this study is much higher than the 23.5% reported by Ugwumba et al. in Enugu, southeastern Nigeria but markedly lower than the 60% reported by Ugwu et al. in Jos, Nigeria.

The high rate of testicular loss has been attributed to delayed presentation, missed diagnosis by the first contact health providers, unnecessary imaging, and poor examination of the genitourinary system.^{15–17}

Late presentation was the norm in this study as only three (13.6%) patients were seen within six hours of the onset of symptoms. Other related studies within^{2,4,5} and outside^{8,10} the West African sub-region have reported a similar trend of delayed presentation. This brings to the fore the need for awareness and sensitisation campaigns among adolescents and young adults who are the most vulnerable group, as well as the parents. This intervention is critical considering that most delays occur outside the hospital¹⁰ and the rate of testicular salvage is inversely related to the duration of testicular torsion.¹⁸



Figure 2: A high-riding right testis in a patient with acute testicular torsion

The diagnosis of ATT is often clinical and frequently made after a thorough clinical examination. An examination of the external genitalia will often reveal swelling of the testis, testicular tenderness, a high-riding testis (Figure 2), a transverse lie of one or both testes, and absent cremasteric reflex.

Twenty-one of the 22 patients in this study had ATT clinically diagnosed. Only one patient had testicular torsion diagnosed with colour doppler ultrasound scan. Colour doppler scan shows reduced or absent blood flow to the affected testis in patients with ATT. Ultrasound scan is non-invasive, accessible, and has no radiation. It has high sensitivity and specificity.¹⁹ It has, however, been reported to delay surgical intervention with a resultant higher orchidectomy rate.²⁰ Though reliance on clinical findings alone may lead to a high rate of misdiagnosis,²¹ unnecessary imaging investigations that may result in delay in surgical intervention should be avoided. When both history and physical examination findings are suggestive of testicular torsion, prompt exploration without any confirmatory investigation is recommended.²² In neglected cases of testicular torsion, testicular atrophy may occur.

All patients in this study had scrotal exploration with bilateral orchidopexy or orchidectomy with contralateral orchidopexy where indicated. The majority of the patients had surgery under local anaesthesia. Local anaesthesia has been noted to limit the unnecessary delays associated with arranging spinal or general anaesthesia.²³ The exploration of both hemiscrotum was done with a median raphe incision. The nonviable testes were removed while the indeterminate ones were enwrapped in warm saline-soaked gauze for approximately seven to ten minutes and then re-examined for viability. The viable testes were detorsed (Figure 3) and fixed to the dartos with nonabsorbable sutures at three points. The contralateral testes were also fixed at three points.

The orchidectomy rate of 40.9% reported in this study may be attributable to the delay in presentation and the relative time lag in



Figure 3: A viable right testis after detorsion showing a high investment of the tunica vaginalis

intervention. This rate is comparable to the rate of 41.7% reported by Ugwumba et al.² but higher than the rate of 12.9% reported by Obi et al.⁴

The limitations of this study were the retrospective nature and the limited number of patients who were managed for ATT. Additional evaluations of a larger number of patients with testicular torsion are warranted.

Conclusion

There is a need to maintain a high index of suspicion and lower threshold toward the exploration of acute scrotal pain especially among adolescents and young adults. Immediate scrotal exploration should be the first line of management of acute scrotum in this age group.

Delayed presentation and surgical intervention remain important causes of serious morbidity in this environment. A transverse lie of the testis was the commonest predisposing factor in this study. The rate of testicular loss is high in this study due to the high rate of late presenters and the time lag between presentation and surgical intervention. Delay in presentation and treatment is common and needs to be addressed by public health enlightenment campaigns, comprehensive health insurance, and more efficiently run theatres.

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Conflict of interest

There are no conflicts of interest.

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Ethical approval

This study was carried out in accordance with the principles outlined in the Declaration of Helsinki. We do not have any functional research

ethics units in our respective institutions, hence the challenge in providing the ethical approval letter for this retrospective study.

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