



Testicular torsion as seen at Kilimanjaro Christian medical center, Moshi-Tanzania

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Abstract

Background: Testicular torsion is a common condition in both developed and developing countries. Testicular torsion is an emergency urological condition. Early diagnosis and treatment are crucial to restore perfusion and preserve testicular viability. Testicular torsion needs special attention due to its psychosocial long term impact which can be avoided if early intervention is done.

Objectives: The aim of the study was to determine the pattern of presentation and early outcome of patients with testicular torsion managed at KCMC.

Patient and method: This was a hospital based descriptive retrospective and prospective study conducted at KCMC. It involved patients presenting to urology department confirmed to have testicular torsion managed during the period of study from January 2006-January 2015.

Results: A total of 74 patients were managed for Testicular torsion during the study period of nine years as per inclusion criteria. The left side was more affected by 64.9%. None of our patients had synchronous bilateral torsion while 4(3.8%) patients had metachronous bilateral torsion. Fifty eight (78%) patients were 13 years of age with a mean age of 16.92 and a standard deviation of 6.01. Twenty two (29.7%) patients arrived at KCMC within six hours from the onset of symptoms while 48 (64.9%) patients reported to our hospital beyond six hours but less than 24 hours. Scrotal pain was the main complaint.

Fifty (68%) patients were misdiagnosed at the peripheral health facilities and treated empirically with antibiotics. Ninety six point nine percent of those with more than 360 degrees of rotation and duration of arrival to KCMC beyond six hours were found with ischemic necrotic testis compared to 52.4% of those with a degree of rotation less than 360 and less than six hours on arrival at KCMC. (p- Value 0.000).

Orchiectomy of the affected testis and fixation of the unaffected testis was the most commonly adopted treatment option by 55.4%. Eighty four percent of our patients had firm and smooth testis at follow up of three months with 16% having atrophic testis at three months in both groups (retrospective and prospective arms).

Conclusion: Testicular torsion is common in our setting affecting the young adolescent group with the left testis being more affected. The majority of patients presenting late (>6 h) require orchiectomy owing to testicular necrosis. Chances of testicular salvage after torsion are higher if patients present early. Outcome at three months for both affected and those fixed prophylactically is promising by having viable testis.

Keywords: testicular torsion

Introduction

Testicular torsion was described in the English literature by Rigby *et al*, 1902. About 10% of testicular torsions occur during prenatal life or in the perinatal period. It has been documented that very little can be done to salvage a torsion which has occurred in utero while the child born with normal testes and develops torsion thereafter need immediate exploration. The estimated annual incidence of up to one case per 4000 males below the age of 25 years has been reported (Williamson, 1976; Ransler *et al*, 1982; Ben-Chaim *et al*, 1998; Knight *et al*, 1984) [38, 27, 4, 15].

The incidence however peaks between the ages of 14 and 16 and gradually declines throughout young adulthood. This does not deny the fact that testicular torsion can occur at any age. The left testis has been reported to be more vulnerable than the right with the reflection of greater length of the spermatic

cord on the left giving a ratio of 6:4 respectively with 1% which can occur bilaterally (Knight *et al*, 1984; Skoglund *et al*, 1970; Ben-Chaim *et al*, 1992; Shafi *et al*, 2014) [15, 34, 3, 32].

Testicular torsion can occur more commonly during cold weather as the cremasteric muscle contracts to protect the testis by elevating and rotating it hence predisposing it to torsion. Testicular trauma has been postulated as predisposing factor by stimulating the cremasteric muscle contraction (Osada *et al*, 1985; Skulka *et al*, 1983; Williamson *et al*, 1982; Korke *et al*, 2012) [24, 39, 16].

Anatomical anomalies are believed to play an important etiological role in predisposing to torsion. The bell clapper deformity is well recognized whereby the testis lies horizontally since the insertion of the tunica vaginalis into spermatic cord is abnormally high hence the testis is made relatively free to rotate on a vasculomesorchium within the

tunica vaginalis (Ben-Chaim *et al*, 1998; Grushevsky *et al* 2011) [4].

Polyorchidism has been reported to predispose an individual to torsion; maldescended testes are more prone to torsion. This also can happen to an individual with intraabdominal testes especially in the presence of malignancy (Knight *et al*, 1984; Saxena *et al*, 2012) [15, 31].

Torsion of the testis around its vascular access starts with venous occlusion and then arterial occlusion leading to ischemia followed by necrosis of the testis of which its severity depends on the duration and degree of torsion (Skoglund *et al*, 1970) [34]. Moreover it has been documented that complete turns can result in irreversible gross testicular changes within two hours contrary to one turn which can be tolerated without ill effect for 12 hours but can lead to testicular infarction if sustained for 24 hours in the dog. The human testis occasionally can survive more than 10 hours of torsion (Elsaharty *et al*, 1984; Cost *et al*, 2011) [11, 8].

Clinical history is a vital for diagnosis. Patients describe a sudden onset of pain at a distinct point in time, with subsequent swelling. Physical examination may demonstrate a swollen, asymmetric scrotum with a tender high riding testicle on the affected side. Children normally have a brisk cremasteric reflex that usually is lost in the setting of torsion. The diagnosis is made by clinical history and examination, but can be supported by a Doppler ultrasound which typically shows decreased intratesticular blood flow relative to the contra lateral testis. It has been mentioned that if an ultrasound is not promptly available, timely surgical exploration should ensue if there is reasonable suspicion of torsion. However besides ruling out other pathologies, an ultrasound can rule out an associated neoplasm that would necessitate tumour serum marker evaluation and inguinal, rather a scrotal incision (Barthold *et al*, 2007; Baruga *et al*, 2013) [1, 2].

Immediate surgical exploration can salvage an ischemic testis, as it has been documented that more than 80% of testes can be salvaged if surgery is performed within 6 hours, which decreases to 20% or less as time progresses beyond 12 hours. At time of surgery, the contra lateral testis must be explored and fixed to the dartos fascia due to the possibility that the same anatomic defect allowing torsion exists on the contra lateral side. Midline or bilateral transverse scrotal incisions are made. Once the testis is detorsed, it should be assessed for viability after being given time for normal blood flow to resume. The testes are fixed to the dartos fascia with a small, nonabsorbable suture on their medial and lateral aspects, taking care to ensure that the spermatic cord is not twisted before doing so. Orchiectomy should be performed to avoid later risk of abscess formation only if the testis is clearly necrotic because overall testicular function may be improved with testicular preservation in cases of moderately delayed (15 hours) presentation (Caesar *et al*, 1994; Mansbach *et al*, 200; Makela *et al*, 2007, Cost *et al*, 2011; Molokwu *et al*, 2011) [7, 21, 20, 8, 22].

Methods

Study design

This was a descriptive; hospital based combined prospective and retrospective study that involved patients presenting to urology department confirmed to have testicular torsion managed during the period of study from January 2006-december 2014.

Only patients who consented were included in the prospective group. Those who attended follow up clinics in both groups for three months. All patients who did not consent to participate in the study for those who were in the prospective arm. Case notes with incomplete information for the retrospective group. Lost for follow up in three months.

Ethical issues;

Ethical clearance was approved by the KCMUCO Research and Publications Committee (No 682). However no patient was denied of appropriate and adequate treatment upon not consenting. All patients' information were kept confidential.

Data processing and analysis

A structured questionnaire was used to collect data from patient's case notes. Checking of the questionnaire for completeness was done and the entered into computer for analysis where SPSS version 18 was used to analyze the information. Cross-tabulations were generated, and where comparisons were made, significance was considered at p-value of less than 0.05.

Results

A total of 74 patients were managed for Testicular torsion during the study period of nine years as per inclusion criteria, of these, 43 were retrospective and 31 were prospective. The left side was affected in 48 (64.9%). Four patients (3.8%) had metachronous bilateral missed torsion presenting with infertility. Urinalysis was done in 33(44.6%) with all of them being negative while scrotal ultrasound was done only in 5(3.8%) patients. Fifty eight (78%) patients were 13 years of age with a mean age of 16.92 and a standard deviation of 6.01, the age range was between 3 and 37 years. Figure 1

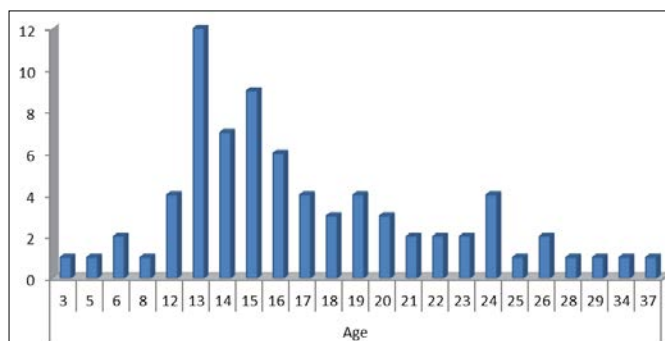


Fig 1: Age distribution of 74 patients treated for testicular torsion

Only twenty two (29.7%) patients arrived at KCMC within six hours from the onset of symptoms while 48 (64.9%) patients reported to our hospital beyond six hours but less than 24

hours. Only 4 (5.4%) reported beyond 24 hours. All of our clients in acute phase presented with hemi scrotal pain, 67 (91%) presented with elevated scrotal swelling, 33 (45%)

reported nausea and vomiting, 4(3.8%) patients presented with infertility due to missed bilateral metachronous torsion. Fig. 2

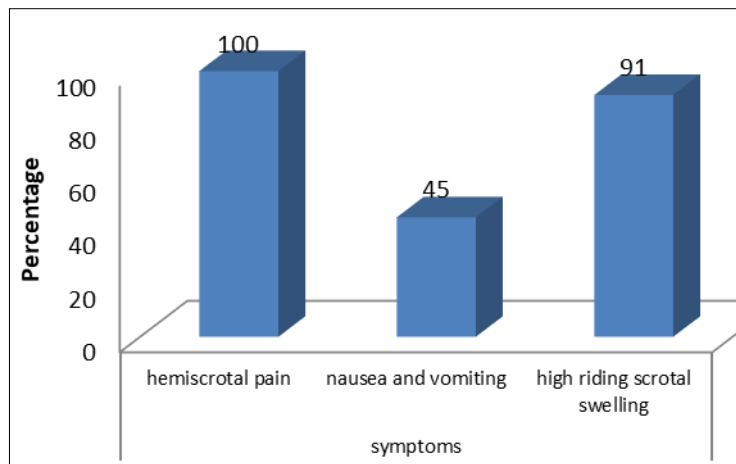


Fig 2: Symptoms/signs at presentation of study participants N=74

Fifty (68%) patients were misdiagnosed at the peripheral health facilities and treated empirically with antibiotics with 30 (41%) being a self-treatment. Figure 3

to 22(52.4%) of those with a degree of rotation less than 360 and less than six hours on arrival to KCMC.(p-value 0.000).Table 1

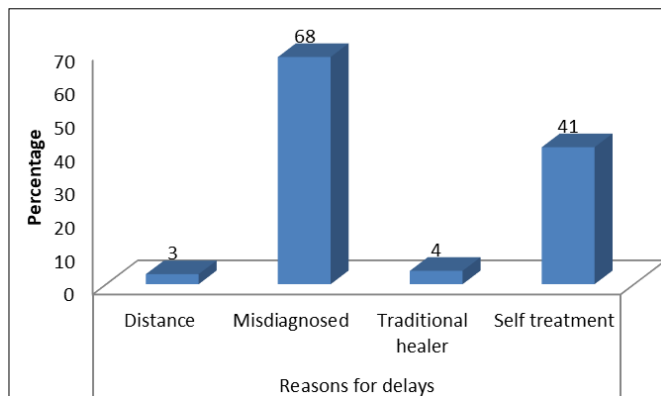


Fig 3: Reasons for delays to reach KCMC hospital N=74

All of our study subjects operated had intravaginal torsion. Fifty three (71.6%) patients had ischemic necrotic testis. Thirty one (96.9%) of those patients with more than 360 degrees of rotation and duration of arrival to KCMC beyond six hours were found with ischemic necrotic testis compared

Table 1: Relationship between degree of rotation, duration and viability N= 74

Degree of rotation and duration			
	Viable	Ischemic	p-value
<360 with ≤6hrs	20(47.6%)	22(52.4%)	
>360 with > 6hrs	1(3.1%)	31(96.9%)	0.000
Total	21(28.4%)	53(71.6%)	74 (100%)

NB; None of our patients had a degree of torsion less than 360 degrees but reaching at KCMC for treatment beyond 6 hours. Orchiectomy of the affected testis and fixation of the unaffected testis was the mostly adopted treatment option by 41(55.4%) followed by detorsion and bilateral fixation at 20 (27%). Of those who had orchiectomy only 3 specimens were sent for histopathological examination and all were necrotic. All our patients had firm and smooth testis at discharge regardless of the type of treatment option given. Eighty four percent of our patients had firm and smooth unaffected and fixed testis at follow up of three months. Table 2

Table 2: Treatment given N=74

Treatment given	Frequency	%
Detorsion and bilateral fixation	20	27%
Orchiectomy of the affected testis and fixation of the unaffected testis	41	55.4%
Fixation of the unaffected testis with preservation of affected testis	13	17.6%
Total	74	100%

NB; No patient was treated by manual detorsion.

Discussion

This study did not aim at giving the magnitude of testicular torsion in Tanzania so it will still remain unknown. But it has demonstrated some significant demography of patients presenting with testicular torsion in a single centre in

Tanzania. This study found testicular torsion affecting young adolescent male peaking at the age of 13years being more (64.9%) on the left side. This is similar to what was found by other studies whereby the incidence peaks between the ages of 14 and 16 and gradually declines throughout young adulthood,

this does not deny the fact that testicular torsion can occur at any age as the finding of this study. The left testis has been reported to be more vulnerable than the right giving a ratio of 6:4 respectively with 1% which can occur bilaterally (Pelander *et al*, 1978; Mansbach *et al*, 2005; Redman *et al*, 1995; Frank *et al*, 2002; Shafi *et al*, 2014) [25, 21, 16]. All our clients had hemiscrotal pain and majority with scrotal swelling at presentation, this is similar to what was found in most retrospective series report that boys presenting early, especially within 6 hours of onset of pain, are more likely to have testicular torsion than other intrascrotal pathology. Nausea and vomiting occurs in 10% to 60% of boys with intravaginal testicular torsion and may be more common in pubertal and post pubertal boys similarly to the findings of 45% of patients presenting with nausea and vomiting in this study. Scrotal edema and erythema may be present depending on the duration or degree of torsion. Dysuria and fever are occasionally reported although no patient reported dysuria and fever in this study (Sessions *et al*, 2003; Murphy *et al*, 2006, Lopez *et al*, 2012; Shafi *et al*, 2014) [30, 23, 18, 16]. In this study, orchiectomy of the affected testis and fixation of the non-affected was the most adopted treatment option in 55.4% followed by detorsion and bilateral fixation at 27% similarly to what was found in other studies whereby the overall frequency of orchiectomy when testes appear non-viable after surgical detorsion is 30% to 70% in large pediatric studies (Makela *et al*, 2007; Redman *et al*, 1995; Liang *et al*, 2013; Shafi *et al*, 2014) [20, 17, 16].

This study demonstrated that orchiectomy was mostly performed in those with non-viable testis, this was also recommended in other studies that orchiectomy should be performed to avoid later risk of abscess formation only if the testis is clearly necrotic because overall testicular function may be improved with testicular preservation in cases of moderately delayed (15 hours) presentation (Karmazyn *et al*, 2005; Sessions *et al*, 2003; Taskinen *et al*, 2008; Kapoor, 2008; Shafi *et al*, 2014) [14, 30, 36, 13, 16].

Some of patients who had fixation of the unaffected testis with preservation of the affected testis had atrophic affected testis at a follow up of three months. Although this study did not assess the effect of torsion on fertility contrary to other studies of which even partial testicular volume loss may reflect significant loss of spermatogenesis in the testis (Heyns, 2003; Murphy *et al*, 2006; Walddert *et al*, 2010; Filho *et al*, 2004; Kehinde *et al*, 2003; Turner *et al*, 2004; Molokwu *et al*, 2011) [37, 23, 22].

Conclusion

Testicular torsion is common in our setting affecting the young adolescent group with the left testis being more affected. The majority of patients presenting late (>6 h) require orchiectomy owing to testicular necrosis. Chances of testicular salvage after torsion are higher if patients present early. Outcome at three months for both affected and those fixed prophylactically is promising by having viable testis.

Recommendation

Greater effort in health education and direct or self-referral to hospital may reduce this delay. Moreover, the message to the national organizations may be that the male health guidelines

should be revised and earlier education about testicular health should be included.

Testicular torsion being a clinical diagnosis, Clinicians up to district level should be trained on the basic knowledge on torsion and need of urgent referral. Prospective study for assessment of quality of sperm and fertility potential post testicular torsion needs to be done.

Study limitations

Proper documentations of patients' case notes especially on the symptoms/ clinical findings at surgery and follow up clinics as of 106 case notes only 74 could fulfil all the inclusion criteria.

Competing interests

The authors declare no competing interests.

Authors' contributions

²OVN: designed the study, collected data, performed data analysis and wrote the report with a manuscript.

¹JSM, ¹BF and ³KN, participated in the study design and manuscript preparation.

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