A RETROSPECTIVE STUDY OF TORSION OF TESTIS - PRESENTATION AND ITS MANAGEMENT IN OUR INSTITUTION

C. T. Karthikeyan¹, Syed Mohamed Ashiq², Magesh Kumar J³, P. Suresh Babu⁴, K. S. Ravishankar⁵, R. N. M. Francis⁶

¹Assistant Professor, Department of General Surgery, Sree Balaji Medical College and Hospital, Chromepet, Chennai.

²Postgraduate Student, Department of General Surgery, Sree Balaji Medical College and Hospital, Chromepet, Chennai.

³Postgraduate Student, Department of General Surgery, Sree Balaji Medical College and Hospital, Chromepet, Chennai.

⁴Associate Professor, Department of General Surgery, Sree Balaji Medical College and Hospital, Chromepet, Chennai.

⁵Professor, Department of General Surgery, Sree Balaji Medical College and Hospital, Chromepet, Chennai.

⁶Professor, Department of General Surgery, Sree Balaji Medical College and Hospital, Chromepet, Chennai.

ABSTRACT

BACKGROUND

Testicular torsion is a surgical emergency, which requires early diagnosis and prompt surgical management to avoid testicular damage. The aim of this study is to survey the clinical findings and outcome of the patients treated for testicular torsion in our Institution, Sree Balaji Medical College and Hospital, Chennai - 44. In this cross-sectional study, a retrospective survey of all cases presenting with acute scrotum and primarily diagnosed as testicular torsion was conducted during 2012 and 2015 in our Institution. All 32 cases were reviewed and several clinical data including duration of symptoms and operative findings were collected. Misdiagnosing testicular torsion can lead to organ loss, cosmetic deformity and compromised fertility. The differential diagnosis of the acutely painful scrotum includes testicular torsion, trauma, epididymitis/orchitis, incarcerated hernia, varicocele, idiopathic scrotal oedema and torsion of the appendix testis.

The aim of this study is to survey the clinical findings and outcome of the patients treated for testicular torsion in our Institution, Sree Balaji Medical College and Hospital, Chennai-44. In this cross-sectional study, a retrospective survey of all cases presenting with acute scrotum and primarily diagnosed as testicular torsion was conducted.

MATERIALS AND METHODS

All acute scrotal pain with proven torsion testis. Incarcerated hernia, scrotal oedema, varicocele were excluded from the study. In this cross-sectional study, a retrospective survey of all cases presenting with acute scrotum and primarily diagnosed as testicular torsion was conducted during 2012 and 2015 in our Institution. All 32 cases were reviewed and several clinical data including duration of symptoms and operative findings were collected. Findings of 29 patients who presented to the Emergency Department with acute scrotum, the median age of the cases was 16.0 years; 14.2% of the patients presented to emergency unit less than 6 hours from symptom exposure. Pain (95.1%) was the major symptom in all patients. There were significant differences between orchiectomised versus non-orchiectomised torsion cases on affected side, symptom presentation to operation time. According to our results, more than half of the cases presented more than in the golden time. Late presentation to hospital was the major cause of delay leading to orchidectomy in patients with testicular torsion.

RESULTS

In total 29 patients were evaluated based on the hospital records during the 3 years period of study. All these patients had undergone surgery. The mean age of patients was 17.71 ± 6.36 with the median age of 16 years (range 6 to 45 years old). Eleven (34.3%) patients were affected on the right side and 21 (65.6%) on the left. Pain (95.1%) was the major symptom among our cases and swelling (35.9%), nausea/vomiting (15.5%) and erythema (10.7%) were declared respectively; 5 (15.6%) patients were operated on within one hour of their presentation to the emergency ward and 27 (84.7%) cases more than this time; 5 (15.6%) of the patients presented into emergency unit less than 6 hours from symptom exposure and 27 (84.7%) individuals more than 6 hours.

CONCLUSION

In conclusion as determined in our study, 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. The message to patients should be that scrotal pain, especially severe pain requires immediate evaluation. Moreover, the message to the national organisations may be that the male health guidelines should be revised and earlier education about testicular health should be included.

KEYWORDS

Torsion, Testis.

HOW TO CITE THIS ARTICLE: Karthikeyan CT, Ashiq SM, Kumar MJ, et al. A retrospective study of torsion of testis - presentation and its management in our Institution. J. Evolution Med. Dent. Sci. 2016;5(104):7668-7672, DOI: 10.14260/Jemds/2016/1730

Financial or Other, Competing Interest: None.

Submission 31-10-2016, Peer Review 18-12-2016,

Acceptance 22-12-2016, Published 29-12-2016.

Corresponding Author:

Dr. Magesh Kumar J,

Room No. S21, Resident Quarters, Block-E,

Sree Balaji Medical College and Hospital,

Chrompet, Chennai-44.

E-mail: magesh.jeeva7@gmail.com

DOI: 10.14260/Jemds/2016/1730

BACKGROUND

Testicular torsion is a common acute surgical emergency with the annual incidence of 1 in 4000 males younger than 25 years.^[1] It has two peaks in age distribution occurring in the perinatal and early adolescent age groups.^[2] As a matter of fact, any male in the peripubertal age presenting with acute scrotal pain should be presumed to have testicular torsion and diagnostic evaluation should be utilised until otherwise confirmed.^[3] Evaluation of acute scrotal pathology should begin with a thorough history followed by a detailed examination of the abdomen, testes, epididymis, cord, scrotal

skin and inguinal region. In equivocal acute scrotal cases, colour Doppler ultrasonography is the diagnostic choice. Age, sudden onset and worsening scrotal pain, nausea/vomiting, absence of ipsilateral cremasteric reflex, horizontal or high riding testicular position and scrotal skin changes have been shown to be predictive of torsion. Misdiagnosing testicular torsion can lead to organ loss, cosmetic deformity and compromised fertility.^{[4][5]} The differential diagnosis of the acutely painful scrotum includes: testicular torsion, trauma, epididymitis/orchitis, incarcerated hernia, varicocele, idiopathic scrotal oedema and torsion of the appendix testis.^[6]

According to pathological aspect, testicular torsion is an acute vascular event that results in rotation of the testicular vascular pedicle resulting in testicular ischaemia and ultimately infarction. Irreversible parenchymal damage will develop if a testicle is twisted. It could cause immediate circulatory changes and long-term sequelae such as testicular function and fertility.^{[7][8]} A rapid diagnosis of torsion of the cord if present is essential and emergency surgical exploration must be performed whenever testicular torsion is clinically suspected. If left untreated, irreversible ischaemia starts appearing in 6 hours. Beyond the six hours, the chances of saving the testis reduce over the next 48 hours.^[9] The ideal treatment is surgical exploration and orchidectomy with contralateral orchidopexy or bilateral orchidopexy depending on the condition of the affected testis. If surgical options are delayed, then manual detorsion should be attempted.^[10] Thus, the aim of this study is to survey the clinical findings and outcome of the patients treated for testicular torsion in Sree Balaji Medical College and Hospital, Chennai-44.

Patients and Methods

Retrospective single-centre review of male primarily treated as testicular torsion was performed. We included all the patients who were presenting with acute scrotal pain to our institution for a period of three years with the primary diagnosis of testicular torsion. Surgical and Emergency Department records consisted of age, clinical symptoms, time from symptom occurred to hospital presentation, time from admission to operating surgery, Doppler ultrasonography, surgical and pathological findings were recorded. In all the cases, surgery was performed.

MATERIALS AND METHODS

In this cross-sectional study, a retrospective survey of all cases presenting with acute scrotum and primarily diagnosed as testicular torsion was conducted during 2012 and 2015 in our Institution. All 32 cases were reviewed and several clinical data including duration of symptoms and operative findings were collected. Findings: Of 29 patients who presented to the Emergency Department with acute scrotum, the median age of the cases was 16.0 years; 14.2% of the patients presented to emergency unit less than 6 hours from symptom exposure. Pain (95.1%) was the major symptom in all patients. There were significant differences between orchiectomised versus non-orchiectomised torsion cases in affected side, symptom presentation to operation time. Conclusion: According to our results more than half of the

cases presented more than in the golden time. Late presentation to hospital was the major cause of delay leading to orchidectomy in patients with testicular torsion.

RESULTS

In total 29 patients were evaluated based on the hospital records during the 3 years' period of study. All these patients had undergone surgery. The mean age of patients was 17.71 ± 6.36 with the median age of 16 years (range 6 to 45 years old).

Eleven (34.3%) patients were affected on the right side and 21 (65.6%) on the left.

Pain (95.1%) was the major symptom among our cases and swelling (35.9%), nausea/vomiting (15.5%) and erythema (10.7%) were declared respectively.

5 (15.6%) patients were operated on within one hour of their presentation to the emergency ward and 27 (84.7%) cases more than this time.

5 (15.6%) of the patients presented into emergency unit less than 6 hours from symptom exposure and 27 (84.7%) individuals more than 6 hours.

Doppler ultrasonography was utilised to confirm the diagnosis as early as possible; 23 (71.8%) patients underwent orchiectomy (19/23 cases was performed contralateral orchidopexy) for a necrotic torsed testis which in their pathological reports, mostly haemorrhagic infarction had been stated. On the other hand, 9 patients were performed detorsion (8/9 cases was performed contralateral orchidopexy). Among those who were orchiectomised, 19 orchidopexy was performed on 23 cases. Post-operative follow-up of our patients indicated no atrophy progress in those patients with confirmed viable and lasting testes during surgery. According to Mann-Whitney test, there was no significant difference between the age of patients diagnosed as testicular torsion and others ($p = 0.177$). After classification of age into two groups (Adults and adolescents (less than 18 yrs.)), there was no significant difference between diagnosis of torsion and other differential diagnosis. Also, there was no significant difference between season and occurrence of torsion.

Sl. No	Variables		Orchiectomised Group (n = 23)	Non Orchiectomised (n = 9)
1	Age Group	Adolescents	14 (60%)	5 (55%)
		Adults	9 (40%)	4 (45%)
2	Side	Left	8 (34.7%)	3 (33.33%)
		Right	15 (65.2%)	6 (66.6%)
3	Presentation Time	Less than 6 hours	0	5 (55%)
		More than 6 hours	23 (100%)	4 (45%)

Figure 1. High Investment of Tunica Vaginalis

Figure 2. Twisted Cord

Figure 3. USG Scrotum - Shows No Vascularity

DISCUSSION

Predisposing Factors

- Inversion of testis.
- Long mesorchium - body of testis only rotates without involving spermatic cord.
- High investment of tunica vaginalis, which acts like mesentery through which the testis rotates - clapper in a bell.
- Voluminous tunica vaginalis.
- Epididymis separation from testis - torsion of testis on the pedicle.
- Undescended and ectopic testis - 7% undergo torsion.
- Injury - sports like football, rugby, cricket ball injury - 5% cases injury preceded the onset of torsion.
- Ambient temperature - more common during cold months - Winter Syndrome.

Types and Initiating Factors

Extravaginal

The testicle and both layers of tunica vaginalis rotate more common in neonatal and prenatal period.

Vanishing Testis

Develops but disappears before birth - prenatal torsion.

Intravaginal

The testicle and the inner layer of the tunica vaginalis rotates more common in children and young adults.

Initiating Factors

Spasm of cremaster muscle, which inserts on the cord obliquely.

Pathology

- Torsion occurs from without inwards.
- Left testis rotates anti-clockwise.
- Right testis rotates clockwise.
- Vascular occlusion - oedema of testis and cord-gangrene of testis and epididymis.
- Mean duration of torsion to non-viable testis was 36 hours.

Signs

Deming Sign

Affected testis is positioned high because of twisting of cord and spasm of cremaster muscle.

Angell's Sign

Opposite testis lies horizontally because of the presence of mesorchium.

Prehn's Sign

Elevation of scrotum relieves pain of epididymo-orchitis, but aggravates in case of torsion.

Cremasteric Reflex

Absent on the affected side.

Emergent evaluation of patients presented with acute scrotal pain should begin with a thorough history taking, detailed physical examination of the abdomen, testes, epididymis, cord, scrotal skin and inguinal region, and noting paraclinical findings such as complete blood count, urinalysis. Extra-attention should be paid to the onset, quality and duration of the pain, swelling and other symptoms that may matter.

On the other hand history of previous perineal trauma, presence of urinary tract infection and sexual exposure or habits should be mentioned. In equivocal acute scrotal cases, colour Doppler ultrasonography as an initial imaging modality is the diagnostic choice, because of well specificity and greater availability. Although radionuclide testicular scintigraphy can be a diagnostic tool when past the acute phase in helping to make or exclude the diagnosis. Once the diagnosis of testicular torsion is confirmed, the rapid restoration of the blood flow to the testis is critical. This can be accomplished by manual detorsion through a surgery or in the case of necrosis orchiectomy.^{[11]-[14]}

According to our findings most of the cases were affected on the left side and bilateral involvement was rare, but in an African study with the similar range of age to our study only 36% presented with testicular torsion with the more frequency on the right side (41.3%). In 23.3% cases both testicles were involved.^[15] Pain (95.1%) was the most prevalent symptom in our study population and almost all the patients declared this as a chief complaint. Besides swelling, nausea and erythema were on the next ranks respectively. Liang T. et al reported that sudden-onset scrotal pain (88%), abnormal position (86%) and absent cremasteric reflex. In a single-centre review of 94 boys presentation included pain (76%), scrotal swelling (65%) and abdominal symptoms (22%).^[16] Yu et al revealed that pain duration and left side manifestation are independent risk factors of testicular torsion.^[8] Altogether, concentration to the pain symptom and its pattern of presentation is a crucial point in diagnosis of acute scrotal pathology. Several authors agree that adolescent patients presenting with testicular swelling, while those above this age range appeared as orchitis.^{[10][17]} The range of age in our study population covers both adolescents and adults. Our results indicated that there was no significant difference between age groups versus diagnosis. Besides, this non-significant difference was consistent in the outcome of surgery between young and adults, which was similar to the findings of Grushevsky et al.^[18] In a 9-year retrospective study by Cummings et al, they demonstrated that males aged 21 to 34 years had more orchiectomies than those aged 8 to 20 years and time to presentation was the key factor for testicular salvage. Despite the higher frequency of orchiectomy among adults, there was no statistically significant difference between the adults and adolescents groups in the time presentation and outcome of surgery.^[19] Previous studies of the seasonality of testicular torsion have yielded conflicting results.^[20] Although, the autumn and winter were prevalent seasons for torsion occurrence; but the difference versus first six months of year was not significant in our study, so as the same report of Cost et al. In contrast, Grushevsky et al in USA, determined that testicular torsion occurrence were more likely in the winter compared with the summer.^[18] This finding was similar to two decades study of Korkes et al in Brazil. It was also demonstrated that temperature and humidity correlated the risk of testicular torsion according to findings of Srinivasan et al.^[5] The main causes of testicular necrosis after torsion are late presentation of the patient to the hospital, incorrect initial diagnosis and delay in treatment at referral hospital. Our findings indicated the high rate of 85.4%, which presented for more than 6 hrs. golden time. This is a questionable and worrying rate. We found significant difference between the duration of symptom presentation and hospital referral and surgery operation (door to OR time) in those whose testis preserving approach was performed and those who underwent orchiectomy. It was previously mentioned in literatures that duration of symptoms for more than golden time and a higher age of patients are described to be risk factors for testicular loss. Ringdahl and Teague indicated that the salvage rates in patients with testicular torsion were 90%, 50% and less than 10% in those seeking medical attention within 6, 12 and 24 hours after the onset of

pain, respectively. In a follow-up study in paediatric centre in Denmark, loss of testicular tissue was significantly associated with long preoperative duration of symptoms and with low postoperative sperm counts. The most probable explanation that could be offered is the fact that on the clinical aspect the symptom occurrence may not be essentially caused by full occlusion of perfusion. In an imaging study, 26% of the patients were detected to have some intra-testicular circulation despite clinical testicular torsion. According to our findings, 15 patients underwent orchiectomy and 6 patients were performed detorsion and others remained underwent orchiopexy, exclusively. Among those who were orchiectomised, 15 orchiopexy was performed 13 cases.

CONCLUSION

In conclusion as determined in our study, 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. The message to patients should be that scrotal pain, especially severe pain requires immediate evaluation. Moreover, the message to the national organisations may be that the male health guidelines should be revised and earlier education about testicular health should be included.

REFERENCES

- [1] Liang T, Metcalfe P, Sevcik W, et al. Retrospective review of diagnosis and treatment in children presenting to the pediatric department with acute scrotum. *American Journal of Roentgenology* 2013;200(5):W444-9.
- [2] Lopez RN, Beasley SW. Testicular torsion: potential pitfalls in its diagnosis and management. *Journal of Paediatrics and Child Health* 2012;48(2):E30-2.
- [3] Mansbach JM, Forbes P, Peters C. Testicular torsion and risk factors for orchiectomy. *Archives of Pediatrics and Adolescent Medicine* 2005;159(12):1167-71.
- [4] Blaivas M, Brannam L. Testicular ultrasound. *Emergency Medicine Clinics of North America* 2004;22(3):723-48.
- [5] Srinivasan A, Cinman N, Feber KM, et al. History and physical examination findings predictive of testicular torsion: an attempt to promote clinical diagnosis by house staff. *Journal of Pediatric Urology* 2011;7(4):470-4.
- [6] Edelsberg JS, Surh YS. The acute scrotum. *Emergency Medicine Clinics of North America* 1988;6(3):521-46.
- [7] Pentyala S, Lee J, Yalamanchili P, et al. Testicular torsion: a review. *Journal of Lower Genital Tract Disease* 2001;5(1):38-47.
- [8] Yu KJ, Wang TM, Chen HW, et al. The dilemma in the diagnosis of acute scrotum: clinical clues for differentiating between testicular torsion and epididymo-orchitis. *Chang Gung Medical Journal* 2012;35(1):38-45.
- [9] Visser AJ, Heyns CF. Testicular function after torsion of the spermatic cord. *BJU International* 2003;92(3):200-3.
- [10] Kapoor S. Testicular torsion: a race against time. *International Journal of Clinical Practice* 2008;62(5):821-7.
- [11] Karmazyn B, Steinberg R, Kornreich L, et al. Clinical and sonographic criteria of acute scrotum in children: a retrospective study of 172 boys. *Pediatric Radiology* 2005;35(3):302-10.
- [12] Slijper N, Sukhotnik I, Toubi A, et al. Critical validation of ultrasound doppler in the diagnosis of torsion of undescended testis. *Israel Medical Association Journal* 2007;9(2):99-101.
- [13] Prando D. Torsion of the spermatic cord: the main gray-scale and doppler sonographic signs. *Abdominal Imaging* 2009;34(5):648-61.
- [14] Lavalley ME, Cash J. Testicular torsion: evaluation and management. *Current Sports Medicine Reports* 2005;4(2):102-4.
- [15] Baruga E, Munabi IG. Case series on testicular torsion: an educational emergency for sub-saharan Africa. *Pan African Medical Journal* 2013;14:18.
- [16] Saxena AK, Castellani C, Ruttenstock EM, et al. Testicular torsion: a 15-year single-centre clinical and histological analysis. *Acta Paediatrica* 2012;101(7):e282-6.
- [17] Shergill IS, Gupta S, Arya M, et al. Testicular torsion: a twist to the tale. *International Journal of Clinical Practice* 2003;57(4):353.
- [18] Grushevsky A, Allegra JR, Eskin B, et al. The seasonality of testicular torsion. *Pediatric Emergency Care* 2011;27(12):1146-7.
- [19] Cummings JM, Boullier JA, Sekhon D, et al. Adult testicular torsion. *The Journal of Urology* 2002;167(5):2109-10.
- [20] Molokwu CN, Somani BK, Goodman CM. Outcomes of scrotal exploration for acute scrotal pain suspicious of testicular torsion: a consecutive case series of 173 patients. *BJU International* 2011;107(6):990-3.