Testicular Torsion: A Perspective from the Middle East

A.A. Al-Hunayan A.M. Hanafy E.O. Kehinde K.A. Al-Awadi Y.M. Ali
A.R. Al-Twheed H. Abdulhalim

Department of Surgery (Division of Urology), Mubarak Al-Kabeer, Faculty of Medicine, Kuwait University, Kuwait

Key Words

Spermatic cord torsion, incidence · Middle East · Testis · Seasons · Testicular atrophy

Abstract

Objective: To report our experience in the management of testicular torsion with emphasis on seasonal variation, salvage rate and the status of the torsted testis 3–6 months after orchidopexy. **Subjects and Methods:** Seventy-five patients with a presumptive diagnosis of testicular torsion, who presented to our hospital between January 1999 and December 2002, were included in the study. Following scrotal exploration, 63 patients were found to have testicular torsion. Of these, 11 with nonviable testes had orchiectomy while 52 with viable testes had orchidopexy. Both groups of patients had simultaneous contralateral orchidopexy. Patients who had orchidopexy were followed up 3-monthly by testicular ultrasound to assess the volume of the affected testis. **Results:** Sixty-three patients were confirmed to have testicular torsion. The average number of new cases in the winter was 6.7 compared to 4 in the summer. Fifty-two patients underwent orchidopexy to give an operative salvage rate of 82.5%. Of 51 patients in whom the duration of torsion was less than 24 h, 1 (2.0%) had a nonviable

testis, whereas of 12 patients in whom the duration of torsion was more than 24 h, 10 (83.3%) had a nonviable testis. After a minimum follow-up of 3 months for patients who had orchidopexy, 7 (13.5%) developed testicular atrophy. The incidence rate was estimated to be 7.9 cases per 100,000 population. **Conclusion:** The highest incidence was during the cold season. The outcome of surgical management of testicular torsion was dependent on the duration of torsion.

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Introduction

Over the years, the care of patients with acute scrotal pain has shifted from the field of psychiatry to surgery [1]. Testicular torsion is an important and a frequent cause of acute scrotal pain. In the United Kingdom, it is estimated that the incidence of testicular torsion is 1 case per 4,000 below the age of 25 [2] and about 400 boys a year will lose a testis in this way [3]. In addition, epidemiological data show a rise in the hospital discharge rate for torsion of the testis from 10.7 per 100,000 in 1968 to 27.0 per 100,000 in 1980 [4]. The rise in admissions could be due to a greater awareness of the diagnosis among general practitioners, leading to increased referral of early cases. Ambient tem-

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Dr. Adel A. Al-Hunayan, FRCS (C)
Department of Surgery (Section of Urology)
Faculty of Medicine, Kuwait University, PO Box 24923
13110 Safat (Kuwait)
Tel. +965 5319475, Fax +965 5319597, E-Mail alhunayan@hsc.kuniv.edu.kw

Fig. 1. Seasonality of testicular torsion in Kuwait (1999–2002). Mean temperature: summer (May–September), 40.7°C (range 36–55); fall (October–November), 28.7°C (range 15–32); winter (December–February), 18.2°C (range 5–19); spring (March–April), 26.6°C (range 13–30).

peratures may have a role in the incidence and etiology of testicular torsion as more cases are diagnosed during the cold months of the year [5]. Thus, testicular torsion is a common condition with a documented seasonal variation in its incidence. Prompt diagnosis and treatment are indicated to ensure viability of the organ. The viability of the twisted gonad or the condition of the testis after orchidopexy is directly related to the time elapsed between the onset of symptoms and scrotal exploration. A delay in diagnosis and treatment may lead to irreversible damage (infarction) or decrease in testis volume (atrophy) after orchidopexy and, to some extent, contralateral testicular dysfunction [6].

In this paper we report our experience in the management of testicular torsion in a very busy urology unit of a teaching hospital in Kuwait, with emphasis on seasonal variation, salvage rate and the status of the torqued testis 3–6 months after orchidopexy.

Subjects and Methods

Seventy-five patients with a presumptive diagnosis of testicular torsion who presented to the Urology Unit of Mubarak Al-Kabeer, Kuwait, from January 1999 through December 2002 were included in this prospective study. All the patients were Arabs from the Middle East and were drawn from a total population served by the above

hospital with an average annual number of 20,000 males, 10–45 years old. They all underwent immediate scrotal exploration. Patients with a doubtful clinical diagnosis of testicular torsion and or delayed presentation underwent testicular Doppler study and or testicular nuclear scan after intravenous administration of technetium-99m pertechnetate. The decision to explore the testes in these doubtful cases was aided by the findings of these radiological imaging techniques. Of the 75 patients, 63 patients were found to have testicular torsion and were included in the analysis while 12 patients who had other testicular disorders such as torsion of the morgagnian cyst or epididymo-orchitis were excluded. The age of the patient, the side of the affected testis, the month of year on presentation and the duration of torsion (time elapsed from onset of symptoms till scrotal exploration) were recorded in a data sheet specifically designed for this study. Intraoperative diagnosis of acute testicular torsion was made when the affected spermatic cord was found to be twisted within the tunica vaginalis, the testis was congested and the tunica vaginalis showed high investment with or without reactive secondary hydrocele. Following intraoperative detorsion, the surgeon's judgment of testicular viability was recorded. Fifty-two patients with viable testis had bilateral orchidopexy while 11 with a nonviable testis had ipsilateral orchiectomy and contralateral orchidopexy. After collection, the data were entered into a SPSS computer program (version 10) for analysis. All patients were followed up 1, 3, 6, 9 and 12 months postoperatively, with ultrasonographic assessment of the volume of both testes to determine the relative testicular volume. Testicular atrophy was defined as a reduction in the volume of the affected testis corresponding to more than 50% the size of the contralateral normal testis (i.e. <33% split relative volume).

We also studied the effect of ambient temperatures on the incidence of testicular torsion in Kuwait by comparing the number of new cases seen during the four seasons of the year.

Results

Of the 75 patients who underwent scrotal exploration, 63 (84%) had testicular torsion. Of the remaining 12 (16.0%), who did not have testicular torsion, 6 (8%) had epididymo-orchitis and a similar number had torsion of the morgagnian cyst. Of the remaining 63 (84.0%) patients, the mean age on presentation was 18.3 (range 11–45) years. Fifty-three (84.1%) patients were between 11 and 20 years, 6 (9.5%) were between 21 and 30 years and 4 (6.4%) >31 years. The average annual incidence rate was estimated to be 7.9 cases per 100,000 population. The torsion was unilateral in all cases, being left- and right-sided in 43 (68.3%) and 20 (31.7%) patients, respectively. Two (3.2%) patients gave a history of ipsilateral previous recurrent scrotal pain prior to admission for torsion of the testis. None of the patients developed recurrent torsion after orchidopexy. Figure 1 shows that the average number of new cases of testicular torsion per month is higher during the cold seasons of the year in Kuwait.

The overall mean duration of torsion was 18.8 h (range 2–168). The mean duration of torsion in patients who had a viable testis at exploration was 5.8 h (range 2–48) compared to 63.7 h (range 12–168) for patients who had a nonviable testis. This difference was statistically significant ($p < 0.001$).

At scrotal exploration, the affected testis was untwisted and observed for viability with an overall operative salvage rate of 82.5% (table 1), while the remaining 11 (17.4%) patients were subjected to orchiectomy for gangrenous testes. In 2 patients, the testes were found to be viable 48 h after the onset of symptoms. However, the extent of the cord twist in these 2 patients did not exceed 360° and probably they had some degree of intermittent torsion. One patient had a twisted cord of more than 1,080° and the testicle was found to be infarcted, although the duration of the torsion was about 12 h. Only 1 out of 51 (2.0%) patients in whom the duration of torsion was less than 24 h had nonviable testis, while 10 out of 12 (83.3%) patients in whom the duration of torsion was more than 24 h had a nonviable testis (table 1). This difference was statistically significant ($p < 0.001$).

After a minimum follow-up of 3 months, 7 of 26 (26.9%) affected testicles were atrophic when the duration of testicular torsion was between 4 and 24 h (table 1). There was no atrophy when the duration of testicular torsion was less than 4 h (24 testicles). In the affected testes, reduction of testicular volume started to be noted after 3 months of follow-up. No further reduction in the testicular volume was detected after 6 months of follow-up. Forty-five (71.4%) patients, including the 2 patients who presented after 48 h from the onset of the symptoms and who were found to have less than a 360° spermatic cord twist and who underwent orchidopexy for a viable testis, had normal testes after a minimum of 3 months of follow-up (table 1). Seven out of 52 (13.5%) patients who underwent orchidopexy had some degree of testicular atrophy. When the duration of torsion was less than 24 h, no patient lost his testis unless the spermatic cord torsion was more than 3 twists. Beyond 24 h of testicular torsion, no patient had a viable testicle unless the spermatic cord twist was less than 360°.

Discussion

Testicular torsion is a urologic emergency; failure to correctly diagnose or manage it appropriately often leads to loss of the testis on the affected side. This is a common medicolegal issue for the urologist [7]. Anderson and Wil-

Table 1. Testicular viability at scrotal exploration and the condition of the affected testes at least 3 months after orchidopexy in relation to duration of torsion

	Duration of torsion			Total (%)
	<4 h	4–24 h	>24 h	
At exploration				
Viable	24	26	2	52 (82.5)
Nonviable	0	1	10	11 (17.5)
Total (%)	24 (38.1)	27 (42.9)	12 (19)	63 (100)
At 3 months				
Atrophic	0	7	0	7 (11.1)
Nonatrophic	24	19	2	45 (71.4)
Orchiectomy	0	1	10	11 (17.5)
Total (%)	24 (38.1)	27 (42.9)	12 (19)	63 (100)

The outcome of treatment of torsion of the testis depends on the duration of torsion.

liamson [8] clearly reported the symptoms and signs of testicular torsion. History of acute onset of severe ipsilateral testicular pain and swelling were seen in 89% of the patients. Urinary symptoms of dysuria and frequency were noted in only 5% and vomiting in 39%. Horizontal lie of the testis on the contralateral side suggests bell-clapper deformity in 25% and indicates a high probability of contralateral torsion. On the affected side, the testis is tender, swollen, and rides high in the scrotum, with a thickened cord and a secondary hydrocele in 52% of patients [8]. Careful consideration of these facts in any young man presenting with testicular pain could probably reduce misdiagnosis.

In our series, the overall mean duration of torsion was 18.8 h (range 2–168). About a third of all patients had either orchiectomy or developed testicular atrophy following orchidopexy. Even prompt intervention on presentation could still put this group of patients at risk. The lag period from the onset of symptoms until presentation to the hospital must shorten and this can only be accomplished through greater efforts in health education of the primary care physicians and the public, as emphasized by Rampaul and Hosking [9].

In our series the average age at presentation was 18.17 years, which is slightly higher than in other series that have included pediatric patients, which have reported mean ages from 14.4 to 16.7 years [8, 10]. This could be a factor in our low (19.6%) orchiectomy rate compared to other series that reported rates as high as 38–62% [8, 11].

Older patients are better at giving a clear history of the disease and are more cooperative during examination. In addition, as Barada et al. [12] reported, adult males 18 years or older present early compared to younger patients. These facts combined may mean that older patients are at a lesser risk for testicular loss after torsion.

Ambient temperature has been associated with variations in the incidence of testicular torsion [5, 8, 13–15]. The effect of ambient temperatures on the incidence of testicular torsion in Kuwait was studied by calculating the average number of new cases diagnosed per month for the period 1999–2002. There are four distinct seasons in Kuwait: summer, fall, winter and spring. The summer is hot, lasting from May until September. Sandstorms and very hot winds in June and July are common, and the air usually stays dry until August or September, when the humidity rises. Mean temperatures in summer range between 40 and 55°C. From September to December, the temperatures drop dramatically. The fall months (October and November) usually see temperatures ranging from 15 to 32°C. Winter, from early December until February, is relatively cold with temperatures between 5 and 17°C. Temperatures in the spring (March and April) are pleasant, ranging from 13 to 30°C. While Shukla et al. [5] and Mabogunje [13] reported an increased incidence of testicular torsion during the cold months of the year from the UK and Nigeria, respectively, Preshaw [14] reported no seasonal peak in the incidence of cases of testicular torsion from Canada. The reason for the discrepancy, most probably, is that the climate in Canada can be considered cold almost throughout the year. In our experience, there was a tendency towards seeing more cases of torsion of the testis with a decrease in the outside temperature (fig. 1). This observation has also been reported from the UK [8], Israel [15] and the USA [16]. Cremasteric muscle spasm in response to cold or pain has been implicated in initiating and maintaining testicular torsion [17].

The estimated average annual incidence rate of 7.9 per 100,000 is remarkably lower than what has been reported in other series from the Western hemisphere where incidence rates as high as 42.4 per 100,000 have been reported [8]. We are not sure of the factors that might explain the remarkable difference in the incidence of testicular torsion in Arab young men compared to Caucasians. Our average annual incidence of testicular torsion is low compared to reported series in Caucasians.

Although the role of radiological studies in the evaluation of acute scrotal pain remains controversial [10], they have been valuable in our experience. It is our policy to obtain a testicular nuclear scan and or Doppler studies of

the testis in all cases in which the duration of the scrotal pain is more than 24 h and or the clinical situation is equivocal. This is to exclude conditions other than torsion of the testis and hence reduce the number of unnecessary scrotal explorations. We have been able to achieve an 84.0% clinical accuracy rate at diagnosis by combining imaging studies with clinical assessment. Immediate surgical exploration is generally performed when the duration of pain is less than 24 h and the history is suggestive of testicular torsion.

The salvage rate of the testis following torsion is related to the duration of torsion and the degree of spermatic cord twisting. All cases with torsion greater than 360° and more than 24-hour duration will have ipsilateral testicular loss or severe atrophy if the testis is left in situ [7]. Tryfonas et al. [18] reported testicular atrophy after torsion for as briefly as 4 h in duration but with greater than 360° torsion. Cummings et al. [19] reported testicular salvage rates of 70.3 and 40% when the cord had twisted a mean of 431 and 585°, respectively. Multiple twisting of the spermatic cord can impede the arterial blood flow to the affected testicle and shorten the time needed to cause testicular loss. In our series, 1 patient was found to have a gangrenous testis after only 4 h of torsion. However, this patient had 1,080° twisting of his cord. On the other hand, 2 other patients presented 24 h after torsion and in both, the testes were viable at surgical exploration because both had less than 360° twisting of spermatic cord on the affected testicle.

In this series, the number of patients who lost their testes or developed testicular atrophy remains unacceptably high due to delayed presentation. This indicates the need for better health education of primary care physicians, parents and or patients about acute scrotal pain and its possible grave consequences.

Conclusion

The findings indicate that the incidence of testicular torsion among Arabs in Kuwait is low. The frequency of torsion of testis is affected by external ambient temperature and is higher during the coldest than warmest months of the year. Our testicular salvage rate was high presumably due to relatively high age of the majority of the patients in the study. After orchidopexy, the testicular atrophy rate was higher in those patients with greater than 4-hour duration of torsion.

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