

# Anesthetic Management of Testicular Torsions and Seasonal Distribution: 5-Year Analysis

## Testis Torsiyonlarında Anestezi Yönetimi ve Mevsimlere Göre Dağılım: 5 Yıllık Analiz

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### ABSTRACT

**Introduction:** Testicular torsion (TT) occurs when the testis rotates around the spermatic cord. It is a urological emergency that may result in the testicular loss if medical intervention is not immediately available. The anesthetic management of cases of TT operated in our clinic within five years and the results of their seasonal distribution have been discussed with the current literature.

**Material and Method:** Fifty-seven patients, who were operated for TT by urology clinics at our hospital between January 2013 and December 2018, were included in the study. Patients were divided into two groups (group1: detorsion, group2: and orchiectomy) according to the surgical operation we underwent. Patient demographic data, the elapsed time from onset of symptoms to operation, ASA scores, anesthetic method, duration of hospital stay and seasonal distribution of cases were examined.

**Results:** The mean age of the 50 patients operated due to testicular torsion was  $19.86 \pm 13.23$  years. We used general anesthesia in 32 (64%) patients and spinal anesthesia in 18 (36%) patients. Detorsion was performed in 38 patients (76%) and orchiectomy in 12 patients (24%). The time elapsed from the onset of symptoms to the operation was 16.1 hours in patients undergoing detorsion and 30.1 hours in patients undergoing orchiectomy ( $p < 0.05$ ). The seasonal distribution shows that 6 patients (12%) were observed in summer, 20 (40%) in autumn, 9 (18%) in winter and 15 (30%) in spring. The incidence was higher in the cold weather conditions, but the difference was not statistically significant. There was no perioperative morbidity and mortality in the patients.

**Conclusion:** Suspected testicular torsion is a season-independent clinical picture. In these cases where the time from the onset of symptoms to the operation is short, detorsion is sufficient. It is a patient population suitable for outpatient treatment, as the length of hospital stay is short.

**Key Words:** Testicular torsion, anesthesia method, seasonal distribution

### ÖZET

**Amaç:** Testis torsiyonu (TT) testisin kordon çevresinde rotasyonu sonucu oluşur. Hızlı müdahale edilmediği takdirde, testisin kaybına kadar gidebilen ürolojik acil bir durumdur. Bu çalışmada kliniğimizde 5 yıl içinde opere edilen testis torsiyonu olgularında anestezi yönetimi ve mevsimlere göre dağılım sonuçları literatür eşliğinde tartışıldı.

**Materyal ve Metod:** Ocak 2013-Aralık 2018 tarihleri arasında hastanemizde üroloji klinikleri tarafından testis torsiyonu nedeni ile opere edilen 50 hasta çalışmaya dahil edildi. Uygulanan cerrahi işleme göre hastalar iki gruba (Grup1: Detorsiyon, Grup 2: Orşektomi) ayrıldı. Hastaların demografik verileri, semptomların başlangıcından operasyona kadar geçen süre, anestezi yöntemi, hastanede kalış süreleri ve mevsimlere göre dağılım değerlendirildi.

**Bulgular:** Testis torsiyonu nedeni ile opere edilen 50 hastanın yaş ortalaması  $19.86 \pm 13.23$  idi. Hastaların 32'sine spinal 8'ine detorsiyon (%76), 12'sine orşektomi (%24) yapıldı. Semptomların başlangıcından operasyona kadar geçen süre detorsiyon yapılan hastalarda 16.1saat, orşektomi uygulanan hastalarda ise 30.1saat bulundu ( $p < 0.05$ ). Mevsimlere dağılım; yazın 6 (%12), sonbaharda 20 (%40), kışın 9 (%18), ilk baharda ise 15 (%30) hasta tespit edildi. Soğuk hava koşullarında insidans daha yüksekti, ancak fark istatistiksel olarak anlamlı değildi. Hastalarda perioperatif morbidite ve mortalite görülmedi.

**Sonuç:** Şüpheli testis torsiyonu ,mevsimden bağımsız bir klinik tablodur. Semptomların başlamasından operasyona kadar geçen sürenin kısa olduğu bu vakalarda detorsiyon yeterlidir. Hastanede yatış süresi kısa olduğundan ayakta tedavi için uygun bir hasta popülasyonudur.

**Anahtar Kelimeler:** Testiküler torsiyon, anestezi yöntemi, mevsimlere göre dağılım.

## Introduction

Testicular torsion (TT) occurs when the testis rotates on the spermatic cord. Delay in diagnosis and treatment of TT leads to necrosis and testicular loss due to interruption of blood flow. Early surgical treatment is essential for testicular salvage. Preoperative anesthesia evaluation should be performed rapidly to shorten the waiting time for the operation in these patients.

Although some studies have investigated the seasonal distribution of TT, their results were different from each other (1,2,3). Here, we aimed to examine the anesthetic management of cases operated in our clinic within five years and the results of their seasonal distribution.

## Material and Method

After the approval of the Institutional Review Committee, Turkey (approval no: 2019/1-14). Adiyaman University Research and Education Hospital, the Fifty-seven patients, who were operated for TT by urology clinics between January 2013 and December 2018, were included in the study. Patients were split into two groups (detorsion and orchiectomy) according to the surgical operation. Patient demographic data, the elapsed time from onset of symptoms to operation, ASA scores, anesthetic method, duration of hospital stay, and seasonal distribution of cases were recorded.

**Statistical Analysis:** SPSS 15.0 (Statistical Program for social sciences) software was used for the analysis of data. Continuous variables were given as mean  $\pm$  standard deviation (SD). Mann-Whitney U test was utilized to determine whether there is any difference between the two groups. Chi-square test was employed to compare the distribution of categorical variables between the groups.  $P < 0.05$  was deemed statistically significant.

## Results

Fifty-seven TT cases who were operated for pediatric surgery by our urology clinics were examined. Complete data of 50 patients were provided for analysis. The median age (range) of the patients was 19.86 (0-60) years. We used general anesthesia in 32 (64%) patients and spinal anesthesia in 18 (36%) patients. Detorsion was performed in 38 patients (76%) and orchiectomy in 12 patients (24%). Of the patients undergoing spinal anesthesia, orchiectomy was performed in 6

and detorsion in 26. Of the patients undergoing general anesthesia, orchiectomy was carried out in 6 and detorsion in 12. Although the percentage of orchiectomy was higher in the general anesthesia group, it was not statistically significant ( $p > 0.05$ ). The time elapsed from the onset of symptoms to the operation was 16.1 hours in patients undergoing detorsion and 30.1 hours in patients undergoing orchiectomy ( $p < 0.05$ ) (Table 1). The seasonal distribution shows that 6 patients (12%) were observed in summer, 20 (40%) in autumn, 9 (18%) in winter, and 15 (30%) in spring. The incidence was higher in the cold seasons, but the difference was not statistically significant (Table 2). Twenty-eight (56%) patients were diagnosed with using Doppler ultrasound and 22 (46%) through physical examination. Only 6 (12%) patients had a history of trauma. Detorsion was conducted in all the traumas. The mean length of stay in the hospital was 1.61 days. There was no perioperative morbidity and mortality in the patients.

## Discussion

TT is an ischemic emergency that takes place in the testis when the testis twists around the axis of the spermatic cord. Depending on the degree of rotation, the blood flow to the testes may be reduced or cut off completely. Any delay in the recovery of blood supply to testes may result in irreversible loss of testicular tissue. TT is a clinical picture that is season-independent. Detorsion is sufficient in these cases where the time elapsed from the onset of symptoms to operation is short. As hospitalization duration is short, it is a patient population that is suitable for outpatient surgery and carries a low perioperative complication risk.

If the blood supply to the testes cuts off, this affects them within a maximum of 4-6 hours, and reperfusion damage starts to form in 12-16 hours at the latest (4). A study reports that the time elapsed from the onset of symptoms to the operation was 15 hours in patients undergoing detorsion and 42 hours in the orchiectomy group (5). When torsion duration was less than 24 hours, 1 (2%) of 51 patients had non-viable testicles. 10 (83.3%) of 12 patients had non-viable testicles when that time is more than 24 hours (6). Our study indicates that the time elapsed from the onset of symptoms to the operation was 16.1 hours in patients undergoing detorsion and 30.1 hours in patients undergoing orchiectomy. Our study also reveals that the majority of the time elapsed until the operation is the one passed

**Table 1.** The time from the onset of septomas to operation

Group	Detorsion (n=38)	Orchiectomy(n=12)	p
Age (years)	19.4±12.7	21.1±15.0	0.699
ASA I / II	34 / 4	12 / 0	0.075
Time until operation (hour)	16.1±21.6	30.1±15.0	0.042
Hospitalization time (day)	1.7±1.7	1.4±0.9	0.546

p<0.05 Statistically significant, SD = Standard deviation, n = number of patients

**Table 2.** Distribution by seasons

Group	Summer	Autumn	Winter	Spring	Total	p
Detorsion (n=38)	4 (10.5%)	18 (%47.4)	6 (%15.8)	10 (%26.3)	38 (%100)	0.271
Orchiectomy (n=12)	2 (%16.7)	2 (%16.7)	3 (%25.0)	5 (%41.7)	12 (%100)	
Total (n=50)	6 (%12.0)	20 (%40.0)	9 (%18.0)	15 (%30.0)	50 (%100)	

p<0.05 Statistically significant, n = number of patients

**Table 3.** Anesthesia methods, diagnosis and detected reasons

Group		Detorsion (n=38)	Orchiectomy (n=12)	p
Anesthesia method	Spinal	26 (%52)	6 (%12)	0.246
	General	12 (%24)	6 (%12)	
The cause of torsion	Spontaneous	32 (%64)	12 (%24)	0.142
	Trauma	6(%12)	0 (%0)	
Diagnostic method	Physical examination	15(%30)	7(%14)	0.251
	Dopler	23(%46)	5(%10)	

p<0.05 statistically significant. n = number of patients

the patients apply to the hospital.

The suspected TT is a time-dependent urgent surgical condition, and consultations should immediately hold with patients in the hospital. Emergency patients pose an essential problem for both anesthesiologists and surgeons. Anesthesiologists take on important tasks in the postoperative period, as is the case with the perioperative period (7). The anesthesiologist should be able to estimate hemodynamic and air-related complications in case of emergency, should take necessary precautions against aspiration prophylaxis in full patients, and be ready for possible complications (8). While taking these precautions, it should not be delayed to be taken the patient under an operation. TT is most commonly seen in men in the group of 10-25 age but may occur at any age (9). The mean age of the 50 patients who were operated for TT by urology clinics in our hospital was 19.86 (0-60) years. We used general anesthesia in 32 (64%) patients and

spinal anesthesia in 18 (36%) patients, who took on under urgent operation due to TT. Our clinic preferred regional anesthesia in cases other than the pediatric age group. We used propofol in 13 of 18 patients applying general anesthesia, and pentothal in 5. Any complication caused by anesthesia has not arisen.

TT is mostly idiopathic and usually occurs without apparent reason. However, it has associated with anatomical, traumatic, environmental factors and others. Six patients had a history of trauma. Detorsion was performed in all the traumas. The mean time passed until the operation was 6 hours in these patients. Due to the rapid admission to the hospital after trauma, the time elapsed up to surgery is considered to be short.

There are many studies examining the seasonal distribution of TT. A study reports that the seasonal distribution of TT was 36.2% in spring, 31% in winter, 19% in summer, and 13.8% in autumn, showing that these patterns of

distribution significantly correlate with the decrease in ambient temperature (1). Another study indicates that the incidence of TT was higher in the coldest half of the year (2). Twenty-one thousand two hundred eighty-nine cases of TT were analyzed in Brazil, reporting that its incidence increased in cold months (3). In our study, the seasonal distribution of TT in 50 patients was higher in cold months, but the difference was not statistically significant.

In conclusion, TT is a clinical picture that is season-independent. Detorsion is sufficient in these cases where the time elapsed from the onset of symptoms to operation is short. As hospitalization duration is short, it is a patient population that is suitable for outpatient surgery and carries a low perioperative complication risk.

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