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## SALVAGE OF THE RIGHT TESTICLE DUE TO TIMELY DETERMINATION OF TESTICULAR TORSION - PRESENTATION WITH A CASE REPORT

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**Abstract:** Testicular torsion (TT) is a common urological emergency among adolescent boys and young men. TT is a severe acute urological emergency caused by twisting of the spermatic cord. It requires prompt diagnosis and treatment. Unfortunately, its importance is still underestimated in everyday life. Early and in time detected TT can be cured in almost every case, whereas late identification may lead to loss of the testicles. This case report illustrates as with the fastest possible procedure, quick anamnesis, physical examination and Doppler ultrasound imaging, a decision was made for scrotal exploration on 14 years young boy and at the exact time a testicular salvage was achieved. The young boy arrived at the emergency unit (EU) with a painful right testicle of 6 hour’s duration. He indicated he had experienced sudden sharp pain in right testicle and enlargement of the testicle when he woke up in the morning around 07.15h. The pain was acute in onset and persisted when sitting. He had no history of recent trauma or urinary infection. During the physical examination the right testicle was moderately swollen and tender, no colour changes on the skin, and tender to palpation; Prehn’s sign was negative (which leads to TT), during inspection a high-riding and horizontally positioned testis (Brunzel’s sign), no abnormally shaped masses fixed on testicle, low grade fever, and leukocytosis with a white blood cell count of 15.4. He reported similar but lighter episode one year before, but he passed it well with antibiotics. Color Power Doppler imaging was performed immediately and showed a total absence of blood flow on the right testicle and normal blood flow in the left testicle. The patient was emergently taken to the operating room (approximately 8h from the beginning of the pain), and informed consent included bilateral orchiopexy, with the possibility of a right orchiectomy. The possibility of testicular atrophy in the setting of testicular salvage was also discussed. The parents agree about operating modalities of the right testicle but refused for the orchiopexy of the left testicle, though we explained the preventive measure for the left testicle. A transverse incision of the right hemiscrotum was made. The tunica was opened and upon delivery of the right testicle, the cord was noted to be twisted 450 degrees. The testicle was dark blue-purple. The cord was untwisted, and the testicle was immediately wrapped in warm gauze. After 5 minutes the right testicle was no longer as dusky appearing and had areas of pinker tissue of the epididymis and testicle. The decision was made to salvage the testicle and an orchiopexy was completed with 4-0 Prolene sutures (on the inferior, medial, and lateral aspects). The dartos and skin were closed in the standard fashion, the drainage Fr.10 was placed and removed after 48h. The patient was counseled to not play organized sports for 2 weeks. The patient was discharged on the third postoperative day. After 6 months of follow-up, the Color Doppler showed the normal flow on the right testicle and no signs of atrophy.

**Keywords:** testicular torsion, urological emergency, early detection.

### 1. INTRODUCTION

Testicular torsion occurs (TT) when the testicle twists around the spermatic cord, resulting in blood flow to the testicle being compromised (Shick & Sternard, 2019). The annual incidence of testicular torsion is 4.5 in 100,000 males 1–25 years of age (Lee, S., et al, 2014). This urologic emergency that affects young men results in an orchiectomy 42% of the time in those undergoing surgery for TT (Sharp, V. J., et al., 2013; Ann Kroger-Jarvis & Gillespie, 2016). Prompt recognition and treatment are critical for testicular salvage; thus, testicular torsion needs to be ruled out in all patients who present with acute scrotal pain (Ann Kroger-Jarvis, & Gillespie, 2016; Gordhan, & Sadeghi-Nejad, 2015). The clinical presentation of testicular torsion is usually acute-onset, intense, unilateral scrotal pain with a similar previous history. Symptoms may also include nausea and vomiting that are secondary to pain. A "high-riding" testis is the hallmark of testicular torsion, which may be due to the shortening of the spermatic cord. A normal cremasteric reflex is rarely observed in patients with testicular torsion (Mellic, & Al-Dhahir, 2019).

Additionally, the testis may have an abnormal (e.g., transverse) position in the scrotum. The testis may be elevated to elicit Prehn's sign. Lack of pain relief (negative sign) may contribute to the diagnosis of testicular torsion (Galejs, & Kass, 1999). Workup should include urinalysis and scrotal ultrasound. The reduction or absence of testicular blood flow assessed by Doppler ultrasonography is compelling for testicular torsion, although false interpretations may occur in young children or neonates with small blood vessels. The absence of blood flow in the testis on ultrasound examination is the gold standard for diagnosis of testicular torsion. This imaging finding is seen in the vast majority of patients with testicular torsion (Forest, A., et al., 2018). However, the survival of torsed testicles with or without subsequent atrophy is known to occur outside that critical time window. The literature review shows that testicular salvage in the first six hours is 90%-100%, from six to 12 hours survival is 20%-50%, and beyond 12 hours survival is 11% (Frohlich, L. C., et al, 2017).

## 2. CASE REPORT

A healthy 14 year old boy presented to the emergency unit (EU) with a painful right testicle of 6 hour's duration. He indicated he had experienced sudden sharp pain in right testicle and enlargement of the testicle when he woke up in the morning around 07.15h. The pain was acute in onset and persisted when sitting. He had some nausea. Under this condition with his parents he immediately visited our EU. He had no history of recent trauma or urinary infection. During the physical examination the right testicle was moderately swollen and tender, no colour changes on the skin, and tender to palpation; Prehn's sign was negative (which leads to TT), during inspection a high-riding and horizontally positioned testis (Brunzel's sign), no abnormally shaped masses fixed on testicle, low grade fever, and leukocytosis with a white blood cell count of 15.4. He reported similar but lighter episode one year before, but he passed it well with antibiotics (Figure 1)

**Figure 1: A high-riding and horizontally positioned testis (Brunzel's sign)**

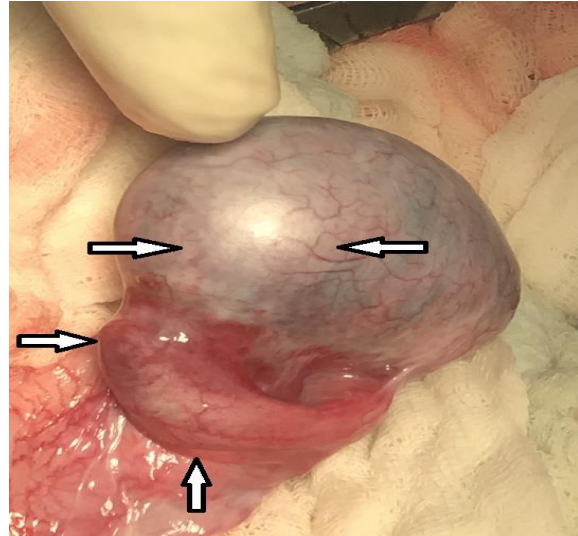
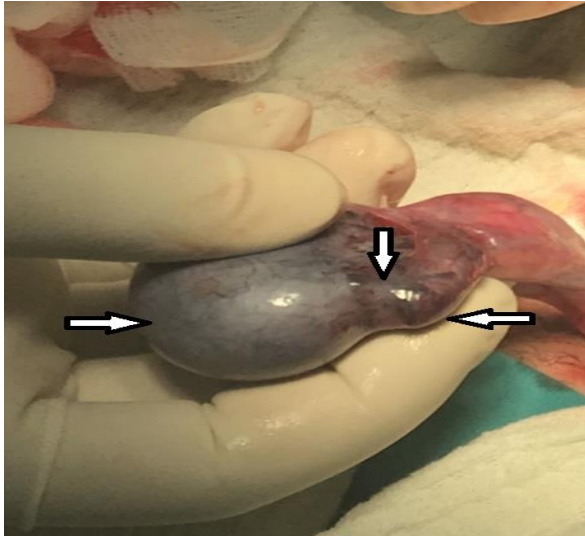


Scrotal sonography was performed immediately utilizing a Mindray DC-N3 ultrasound system with a 10 MHz linear transducer. Color Power Doppler imaging measurements were done in addition to gray-scale imaging. Color Power Doppler imaging showed a total absence of blood flow on the right testis and normal blood flow in the left testis (Figure 2).

**Figure 2: A total absence of blood flow of the right testicle on Color Power Doppler imaging**

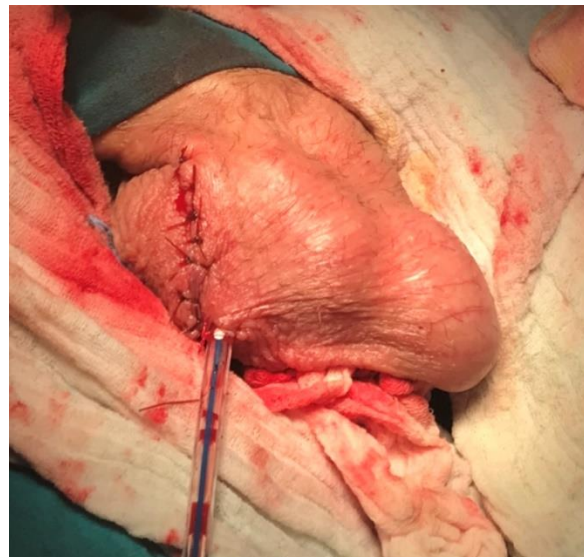
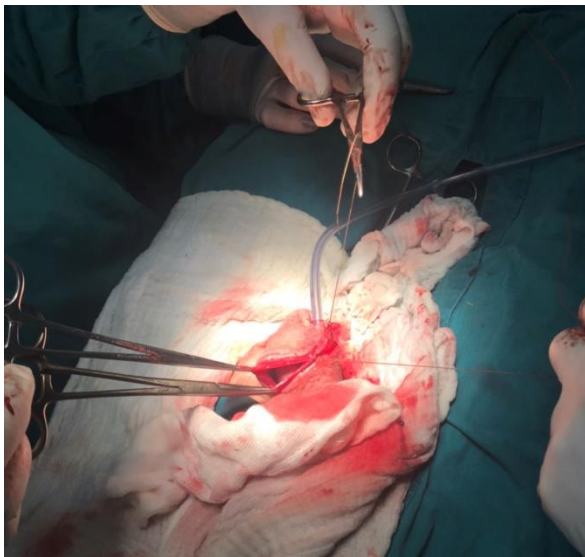


The patient was emergently taken to the operating room (approximately 8h from the beginning of the pain), and informed consent included bilateral orchiopexy, with the possibility of a right orchiectomy. The possibility of testicular atrophy in the setting of testicular salvage was also discussed. The parents agree about operating modalities of the right testis but refused for the orchiopexy of the left testis, though we explained the preventive measure for the left testicle. A transverse incision of the right hemiscrotum was made. The tunica was opened and upon delivery of the right testicle, the cord was noted to be twisted 450 degrees. The testicle was dark blue-purple (Figure 3).



*Figure 3: Dark colour/ purple of the right testicle*      *Figure 4: Light blue colour of the testis; Pink of epididymis*

The cord was untwisted, and the testicle was immediately wrapped in warm gauze. After 5 minutes the right testicle was no longer as dusky appearing and had areas of pinker tissue of the epididymis and testicle. (Figure 4). The decision was made to salvage the testicle and an orchiopexy was completed with 4-0 Prolene sutures (on the inferior, medial, and lateral aspects). The dartos and skin were closed in the standard fashion, the drainage Fr.10 was placed and removed after 48h.

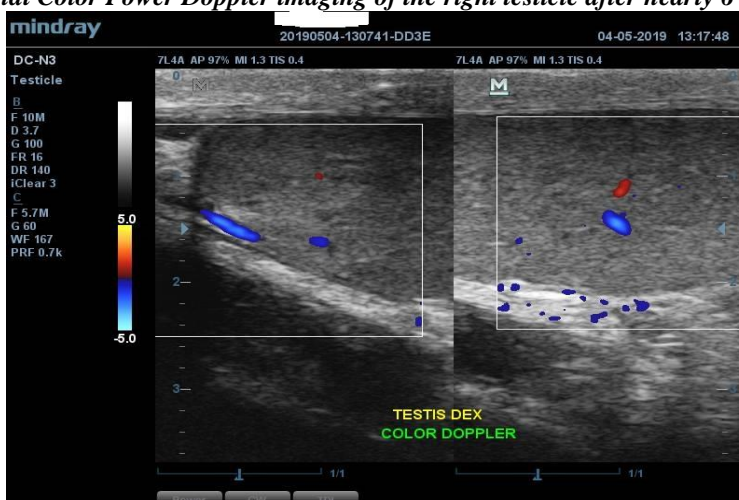


*Figure 4: Prolene 4-0 sutures of the dartos and drainage Fr.10 placement*



The patient was counseled to not play organized sports for 2 weeks. The patient was discharged on the third postoperative day. After nearly 6 months of follow-up, the Color Doppler imaging showed the normal flow on the right testicle and no signs of atrophy. (Figure 5).

*Figure 5: Normal Color Power Doppler imaging of the right testicle after nearly 6 month follow up*



### 3. DISCUSSION

Testicular torsion is a medical emergency, requiring prompt treatment or risking the loss of the testicle. The incidence is 1 in 4,000 males under the age of 25 years. Testicular torsion must be diagnosed quickly and accurately. Delay in diagnosis (and subsequent delay in surgery) risks testicular viability, whereas overdiagnosis subjects patients to unnecessary surgery. Studies have shown that between 16 and 42 percent of boys with acute scrotal pain have testicular torsion. The differential diagnosis of the acutely painful scrotum includes testicular torsion, trauma, epididymitis/orchitis, incarcerated hernia, varicocele, idiopathic scrotal edema, and torsion of the appendix testis (Ringdahl, & Teague, 2006). TT it may be intravaginal or extravaginal and is typically seen in neonatal patients and in adolescents prior to complete testicular descent and scrotal wall fusion. Intravaginal torsion occurs when the testicle can freely rotate within the tunica vaginalis; this can be due to a congenital anomaly called the bell clapper deformity. This deformity is due to failure of posterior anchorage of the gubernaculum, epididymis, and testis, thus allowing the testis to freely rotate within the tunica vaginalis. Extravaginal torsion occurs when the testis rotates within the scrotum owing to inadequate fusion of the testicle to the scrotal wall or increased mobility (Ringdahl, & Teague, 2006; Dogra, & Bhatt, 2004). The torsion follows rotation of the spermatic cord and results in ischemia. The degree of testicular torsion is directly correlated with the possibility of salvage after torsion and time to necrosis. The classic presentation of testicular torsion is acuteonset, intense, unilateral scrotal pain. Patients may also complain of nausea and vomiting, likely secondary to pain (Marcozzi, & Suner, 2001). Intensity increases owing to edema and resultant capsular stretching (Gerber, & Brendler, 2002). Patients may also have a history of scrotal pain that may be related to prior ischemic episodes that resolved spontaneously. On examination, the hallmark of testicular torsion is a “high riding” testicle due to shortening of the cord. Additionally, the testicle may have an abnormal (e.g., transverse) position in the scrotum (Marcozzi, & Suner, 2001). Absence of the cremasteric reflex is a characteristic of torsion in the pediatric population (Rabinowitz, R., 1984). A normal cremasteric reflex would result in elevation of the ipsilateral testicle after an extra gentle stroke of the inner thigh. The cremasteric reflex is rarely seen in patients with testicular torsion. Labs and studies should include urinalysis and scrotal ultrasound to confirm the diagnosis. Doppler ultrasonography can be used to assess testicular blood flow, which is reduced or absent in testicular torsion. This technique, however, is highly operator dependent and may have significantly high false interpretations in young children or neonates with small vessels (Herbener, T. E., 1996). Physical examination shows a swollen and tender testis, an absent cremasteric reflex, and pain not relieved by elevation of the scrotum above the level of symphysis pubis (Prehn’s sign) (Dogra, V. S., et al, 2003). Doppler ultrasonography is the first-line imaging modality used to triage patients with acute scrotal pathologies (Roth et al., 2018). When no detectable flow is seen in the testicle, the presumptive diagnosis of testicular torsion is made. Color flow Doppler alone has a sensitivity of 78.6%–89% and specificity of 77%– 100% for the diagnosis of testicular torsion (Cassar, S., et a., 2008). Testicular torsion must be identified and promptly manually or surgically reversed, as irreversible damage can begin as early as

6 h after the torsion event, with 50% of testes salvageable after 12 h, and 10% salvageable after 24 h (Dogra, V. S., et al., 2003).

#### 4. CONCLUSION

In this report, we present a possible quick and immediately diagnostic evaluation of TT, which with decisive surgical decision the patients condition ended with testicle salvage. Testicular torsion is a true surgical emergency requiring early surgical intervention for successful salvage. A contralateral orchiopexy is highly recommended. Informed consent should include the possibility of testicular atrophy, whose long-term prognosis is unknown. However, in the male infertility population, a history of torsion is rare. Fortunately, because orchiopexy is a relatively simple surgical procedure that can be performed by any surgeon with readily available Color Doppler ultrasound scans, the likelihood of successful treatment of testicular torsion in adolescent boys remains high. However, for exact and timely determination of the TT diagnosis, generally urologist duty is to provide the protocol: the clear history (time and the manner of pain appearance), accurately physical examination, and color Doppler ultrasound as a most important procedure.

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