

Testicular Torsion

From Emergent Recognition to Postoperative Care Management

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Abstract: Testicular torsion is a genital urinary emergency that can lead to unfortunate patient outcomes. Care for these patients in a timely and effective manner will promote better patient outcomes. The purpose of this article is to discuss symptomatology and clinical presentation of testicular torsion. Risk factors associated with testicular torsion and diagnostics are presented. Furthermore, emergent and effective nursing care in the preoperative, intraoperative, and postoperative processes is reviewed. Nursing implications as it relates to best practices and evidence-based care are presented for the nurse generalist and advanced practice nurse.

KEY WORDS: nursing care, testicular torsion

TESTICULAR TORSION: EMERGENT RECOGNITION

Testicular torsion (TT) is a genitourinary emergency in males that can lead to devastating consequences if not treated timely and effectively. TT is a longitudinal twisting of the spermatic cord that attaches to the testicle. Vessels within the spermatic cord supply blood to the testicle. The torsion can impede the blood flow, leading to ischemia, infarction, and possible necrosis, and ultimately impact the function and viability of the testicle (Aquila et al., 2021).

SYMPTOMATOLOGY AND CLINICAL PRESENTATION

TT can affect males at any age but is most commonly seen in the pediatric population. It is estimated that tor-

sion affects 5.9 per 100,000 males ages 1–17 years and 1.3 per 100,000 males over the age of 18 years (Greear et al., 2021). The clinical presentation of TT includes unilateral testicular pain, lower abdominal pain, swelling, and nausea and vomiting. This presentation can mimic other causes of an acute scrotum such as epididymitis, orchitis, and hernia, potentiating a delayed diagnosis and timely treatment. The sudden onset of pain associated with TT can begin at rest, during activity, upon waking, or after trauma. Rosenberg et al. (2021) estimated that up to 20% of pediatric patients diagnosed with TT will present with a single symptom of abdominal or flank pain with no testicular involvement. This data suggests that male patients who present with abdominal or flank pain receive differential evaluations for testicular involvement during the differential diagnosis process. One such way to evaluate for testicular involvement would be to prompt the cremasteric reflex. The cremasteric reflex is elicited when the skin of the thigh in a male is stroked. This action causes the cremaster muscle to contract, which will pull up the ipsilateral testicle. There is a high correlation between the absence of the cremasteric reflex and those diagnosed with TT. Yang et al. (2011) conducted a 20-year retrospective study of pediatric males with confirmed TT ($N = 118$). The median age of the participants was 9.3 ± 5.6 years. The authors determined that the cremasteric reflex was absent in 94.9% of the participants (Yang et al., 2011).

RISK FACTORS

There are numerous risk factors associated with TT. Rotation of the testicle within the scrotum can be an inherited trait and identified in families. Torsion can develop at any age, including before birth as the testicles are developing. The presence of bell-clapper deformity can increase the risk of TT in which the attachment of the spermatic cord to the tunica vaginalis is too high, leaving the testis to rotate inside the tunica vaginalis (see Figure 1 drawing in Supplemental Material, available at <http://links.lww.com/JPSN/A74>). The rapid growth of the testicles

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Supplement digital content is available for this article. Direct URL citations are provided in the HTML and PDF versions of this article.

Journal of Pediatric Surgical Nursing, 2022;11(4):126-129.

DOI: 10.1097/JPS.0000000000000358

during puberty has also been documented as a risk factor indicating the most common age of diagnosis between 12 and 18 years linking age as a risk factor. Intermittent torsion and detorsion, which can be characterized by sudden onset of testicular pain that resolved without treatment, is another risk factor. This may indicate that torsion occurred and may require surgical intervention to decrease the likelihood of reoccurrence in the future (Taghavi et al., 2021).

The Testicular Workup for Ischemia and Suspected Torsion (TWIST) score is used by practitioners to determine a patient's risk of TT based on clinical presentation and symptomology (see score in Supplemental Material Table 1, available at <http://links.lww.com/JPSN/A75>). The TWIST score, also referred to as the Barbosa scoring system, is determined by the assessment of five factors including swelling/edema (2 points), hard testis (2 points), absent cremasteric response (1 point), high-lying testis (1 point), and nausea/vomiting (1 point). Each factor is assigned a value ranging from 0 to 1 or 2, with the maximum number of points being 7 (Qin & Qu, 2022). The results of the TWIST score are interpreted as risk level. Those with a TWIST score of 0–2 are of low risk for TT, a score of 3–4 indicates intermediate risk, and a score of 5–7 points indicates a high risk for TT (Frohlich et al., 2017). Many studies have validated the use of the TWIST score (Barbosa et al., 2014; Frohlich et al., 2017; Qin & Qu, 2022).

EMERGENT CARE

TT should be included in the differential diagnosis during the evaluation process in males presenting with testicular pain to minimize delays in receiving treatment (Yang et al., 2011). It is imperative that TT be differentiated quickly from other types of acute scrotum to limit the time the testicle has a reduced blood supply. Doppler ultrasonography is often used to examine the vascularity of the testicle and rule out other causes of acute scrotum (Hyun, 2018). During the ultrasound, the unaffected testicle serves as a control to determine if decreased blood flow exists to the affected testis (Alkhorji & Barth, 2017). Because of the necessity of timely diagnosis and treatment, suspected cases of TT should include surgical consultation and immediate surgical exploration (Yang et al., 2011).

Salvageability depends mainly on the severity of the torsion and the length of time the torsion has been present. Pogorelic et al. (2016) estimated that patients diagnosed and treated within 6 hours of symptom onset had a 90%–100% chance of testicular salvage, those diagnosed and treated with 6–12 hours of symptom onset had a 20%–50% chance of testicular salvage, and those diagnosed and treated within 12–24 hours of symptom onset

had a rate of 0%–10% of testicular salvage. To this end, it is critical to quickly recognize, confirm, and treat patients with TT through surgical intervention immediately.

PREOPERATIVE AND INTRAOPERATIVE PROCESS

TT is diagnosed via clinical presentation, physical examination, and diagnostic confirmation of ultrasound. Preoperatively, a urinalysis is often performed to rule out other causes of scrotal pain (Gold et al., 2019). In addition, mean platelet volume and leukocyte count are obtained to look for signs of inflammation, which is generally present in patients with TT (Laher et al., 2020).

Ultrasound is the preferred choice in evaluating for TT because of its portability and lack of radiation (Laher et al., 2020). Color Doppler ultrasonography is widely used because it assesses testicular vascular flow in patients, making it highly specific and sensitive (Hyun, 2018). The degree of blood flow that is compromised, however, can be difficult to view depending on the severity of the torsion (Laher et al., 2020). Computed tomography imaging, nuclear imaging, and magnetic resonance imaging are among other diagnostic tests that may be performed preoperatively to assist in diagnosing TT. Although the latter tests may be beneficial in diagnosis, ultrasound remains the gold standard (Laher et al., 2020).

TT is a true medical emergency, and early surgical exploration and detorsion is essential for successful salvage of the testis. Before surgery, informed consent will be obtained and should include possibility of testicular atrophy, orchiopexy (permanent fixation of the testes), and/or orchiectomy (removal of the affected testis; Hyun, 2018). The genital skin will be shaved, intravenous antibiotics will be administered as a prophylactic measure, and anesthesia will be administered (Hong et al., 2020). Epidural, spinal, or general anesthesia may be utilized. Considerations to the patient's last intake of food or fluid may require decompression of the gastric contents.

During the procedure, the scrotum is opened via an incision and the tunica vaginalis is opened to view the color and rotations of the testis. The testis is untwisted, wrapped in warm gauze to aide in perfusion, and observed for improvement of color. An orchiopexy is then performed on the unaffected testis. The testis is fixed with sutures to reduce future torsion. The affected testis is then reexamined for viability. At this time, a decision is made to perform an orchiopexy (move or permanently affix the testis) or orchiectomy (removal of the testis). If the affected testis is to be retained, it is also affixed with sutures (Hyun, 2018). If the affected testis is not viable and an orchiectomy is performed, a prosthesis can be placed at the time of surgery or at a later date (Hyun, 2018).

POSTOPERATIVE CARE

Management of the patient postsurgical resolve of a TT identifies focus on three major goals: pain management, infection control, and patient education.

In relation to pain management, adherence to prescription or nonprescription, over-the-counter, medication in both dosing and administration is necessary. Although some patients may require Tylenol #3 for pain management, most patients will achieve effective management through the administration of non-steroidal anti-inflammatory drugs (Diaz et al., 2014). Nonpharmacologic management of pain includes use of ice, snug, or compression undergarments for support of the scrotum as well as postoperative preventative comfort techniques (Husney & Wood, 2021). Prevention management includes resting when tired, activity every day to increase the blood flow to the scrotal area, and avoidance of strenuous activity.

Infection control is a critical element of the postoperative process. If antibiotics are prescribed, the patient should be encouraged to take the prescription according to the health care provider's orders. When consuming antibiotics, effective care, such as not taking the medication on an empty stomach, and promotion of probiotic use to avoid stomach upset are helpful. Finally, the patient should be encouraged to take the full course of antibiotic therapy (Husney & Wood, 2021).

Education for the patient and families includes management and assessment of serious postoperative complications. The patient and their family should call the health care provider if they have pain that does not get better after intervention, if the surgical incision opens, or if there is an increase in swelling, warmth, redness, presence of a fever, or active bleeding from the site. If the patient is having trouble passing urine, follow-up care should be sought immediately (Nemours, 2017). If the child is of pubescent or postpubescent age, education regarding sexual activity should be broached with the patient as well. To this end, ensuring privacy of the patient is significant for both the health and well-being of the patient and the opportunity to promote active listening and compliance. In this circumstance, the patient should be instructed to avoid sexual activity until cleared by the health care provider.

Education review of aesthetic options, such as a testicular implant, should be done with patients, should this be of concern for the patient or their caregiver. The educational materials should also address the potential impacts to the sexual health and fertility of those diagnosed with TT. Patients undergoing surgical intervention for TT will be required to abstain from sexual intercourse and masturbation for a few weeks postoperatively to ensure proper healing of the surgical sites

(Taylor et al., 2022). If an orchiectomy is required to treat TT, some males may experience a decrease in testosterone, which may lead to decreased libido, although it is a rare effect (The Cleveland Clinic, 2022). The cosmetic appearance of the scrotal sac after an orchiectomy may also impact the sexual health and psychosocial well-being of patients. Numerous studies indicate the importance of discussing testicular prosthesis implantation on patients' emotional health. Patients should be informed about testicular prosthesis implantation before or at the time of surgery and offered counseling for the best results postoperatively (Haymon et al., 2020; Lu & McKibben, 2020; Srivatsay et al., 2019). In most cases, a prosthesis can be implanted a few months after surgery (Nemours, 2017). One final aspect of education should include the ability to have children—or fertility. Most patients can conceive children with one working testicle (Nemours, 2017). It is important to present this information to patients and encourage conversation within these topics.

Incision care is also critically important. Care using soap and water is best. Avoid use of products such as hydrogen peroxide or alcohol as this could be damaging to the healthy surrounding skin tissue (Husney & Wood, 2021). It is possible for scar tissue to develop and inadvertently pull the testicle upward; therefore, the child (or caregiver if the child is too young) should be encouraged to gently palpate the scrotum to ensure that the testicle is down to the base of the scrotum. If the child had an orchiopexy, the testicle will be stitched to the bottom of the scrotum, and it is possible that the parent will see a small dimple at the base of the scrotum where the stitch exists. Parents and caregivers should be alerted that this dimple is normal and will decrease over time (Children's Health of Orange County, 2022).

After 2–3 weeks, if there are no complications and the pain appears to be under control, children can return to normal activity and their daily schedule, which can include return to school or child care provision (Nemours, 2017).

NURSING IMPLICATIONS AND DISCUSSION

Effective nursing care is an essential element to the successful outcomes of patients with TT. Upon arrival either through primary care, urgent care, or emergent care, the nursing assessment must include TT as a differential diagnosis for all patients with reports of abdominal or flank pain. A TWIST score should be standard practice. Immediate and effective management of nurse generalists and advanced practice nurses within the surgical specialty area of care directly impacts the outcomes of patients experiencing TT. Definitive diagnosis and surgical intervention must occur within hours of onset to offer the greatest chance of testicular survival.

Postoperative management of TT directly impacts the role of the advanced practice nurse in follow-up care of healing with educational management to resume activities and promote healing. It is noted that a young boy may be very embarrassed to have the health care team assessing his testicles. Privacy, dignity, asking permission, and inclusion in decision making are essential to lessen discomfort.

CONCLUSION

TT is an emergent condition affecting the pediatric population. Success of management requires expeditious assessment and emergent intervention. Effective collaboration between both medical and surgical teams has shown evidence of positive outcomes. Education by both nurse generalists and advanced practice nurses in both primary and acute care settings will directly impact the care of the pediatric patient in recognizing and seeking care.

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