Testicular torsion: a urological emergency

NIYUKTA THAKARE, KIERAN J. O’FLYNN AND IAN PEARCE

Testicular torsion is an emergency that all health professionals should be aware of. The authors outline the presentation, differential diagnosis and need for rapid management.

**PATHOPHYSIOLOGY**

Torsion occurs when an excessively mobile testis rotates on its cord structures, impeding venous return, which leads to venous congestion and oedema. This results in reduced arterial blood inflow, with subsequent ischaemia and infarction of the testis if left uncorrected.

Testicular torsion may be divided into two main types, depending on the anatomical details of the axis of torsion. An intravaginal torsion (Figure 1a), by far the most frequent in adolescent boys, occurs when the axis of rotation is within the tunica vaginalis. In comparison, an extravaginal torsion (Figure 1b) occurs due to the tunica vaginalis having an abnormally long attachment to the testis. Thus the rotation is external to the tunica vaginalis, which itself is also torted. This variety of testicular torsion occurs mainly in children. Males with a horizontal lie to their testes, the so-called ‘bell-clapper deformity’ are more prone to developing testicular torsion. This anatomical variant arises as a result of the manner in which the tunica vaginalis is reflected on the testis and is bilateral in nature, thus explaining the risk of subsequent contralateral torsion in patients who have experienced a testicular torsion. Testicular torsion may also occur due to a long mesorchium, often associated with cryptorchidism (Figure 1c).

Recent studies have identified cold ambient temperature and increased humidity as risk factors for developing testicular torsion. The exact pathophysiology of this is unknown.

**PRESENTATION**

While there may have been preceding trauma to the genitals, this is not always...
the case and a significant number of patients will present having been woken from sleep with acute unilateral testicular pain. Vomiting is not uncommon and one should be cautious of right iliac fossa pain mimicking appendicitis, especially in children, who are notoriously poor at localising pain. It is easy to miss the diagnosis of testicular torsion in such patients, particularly during the early phase of presentation.

The duration of pain is of the utmost importance – it is almost always less than 24 hours in the presence of torsion, and usually much less. Absence of infective symptoms and signs such as dysuria, frequency and pyrexia should increase suspicion, and the aware patient will often be able to give assurance as to previously normal testes with an absence of palpable abnormalities.

Most patients with acute testicular pain will present directly to the accident-and-emergency unit, but where primary care is the initial port of call, immediate referral to the on-call urological team is mandatory.

On examination, the hemiscrotum in question will be slightly swollen and flushed. The testis may lie horizontally, although this is not a universal feature. This can be verified by observation of the contralateral testis, which will have a similar lie. The testis may also be high riding (higher in position) compared with its counterpart (Figure 2). While both of these are useful clinical findings, neither is pathognomonic, nor can their absence exclude the diagnosis.

Palpation of the testis will reveal exquisite tenderness. Elevation of the testis with the patient in a supine position may worsen the pain (Prehn’s sign). This may be a useful sign to differentiate the diagnosis from epididymo-orchitis, in which the pain gets better with elevation. Absence of the cremasteric reflex is the most useful diagnostic indicator, with a sensitivity approaching 100 per cent.

For some patients testicular torsion does not present as an acute event – usually those with bell-clapper testes, suffering from intermittent testicular torsion. These patients typically present to primary care complaining of acute, severe unilateral testicular pain, which typically resolves itself within minutes to hours. It is uncommon to see such a patient in the acute setting, and hence the diagnosis is based upon a high index of suspicion. If such a diagnosis is thought likely, a urological referral should be made on a semi-urgent basis for consideration of bilateral testicular fixation (orchidopexy).

DIFFERENTIAL DIAGNOSIS

Torsion of testicular appendages

The hydatid of Morgagni is a common testicular appendage embryologically derived from the Müllerian (paramesonephric) duct, whereas the appendix epididymis is a remnant of the mesonephric (Wolffian) duct. Torsion of these structures is most common in a younger age group than testicular torsion, but must be kept in mind in all young men presenting with an acute scrotum. The presentation is similar to that of testicular torsion, but on examination the scrotum, whilst tender, does not display the degree of erythema associated with testicular torsion, nor is the testicular lie abnormal. The ‘blue dot’ sign may be present in the upper half of the hemiscrotum where the infarcted hydatid is visible through tightened skin. However, it may be difficult to visualise, and in its absence the diagnosis may still be made if scrotal tenderness is isolated to a hard nodule at the upper pole of the testis.

If the patient presents to primary care, he should be urgently referred to the on-call urological team for further assessment. Once testicular torsion is excluded, which in many cases may be at the time of scrotal surgical exploration, management consists of either conservative treatment with non-steroidal anti-inflammatory drugs or surgical intervention in the form of scrotal exploration and diathermy to the appendage. This offers a much more rapid resolution of the pain.

Epididymitis

In adult men, epididymitis is more common than torsion, but the latter must be considered as delayed diagnosis may result in testicular loss.

The patient typically presents with rapidly progressive scrotal pain and swelling, which radiates up the spermatic cord and to the lower abdomen. The overlying skin
may be erythematous and the inflammatory process may give rise to a reactive secondary hydrocele. A midstream urine culture should be routinely performed to identify a urinary tract infection. If the patient complains of urethral discharge, a Gram stain should be sent, which may reveal the presence of intracellular diplococci (Neisseria gonorrhoeae). If only white cells are seen, the most likely diagnosis is non-gonococcal urethritis.

If epididymo-orchitis does not resolve within two weeks, the patient should be referred for urgent urological assessment for suspected testicular cancer. Men over the age of 50 years in whom a diagnosis of epididymitis is suspected and proven should be referred for routine urological review to exclude any predisposing factors to urinary tract infection, such as bladder outflow obstruction or structural abnormalities.

Other causes
Less common conditions to be considered in the differential diagnosis of torsion include trauma, hernia, hydrocele and testicular tumour. Vasculitis due to Henoch-Schönlein purpura may also present as an acute scrotum.

INVESTIGATION
Dipstix urinalysis is the only mandatory investigation and is typically negative with testicular torsion. Other investigations such as full blood count and urea are invariably normal and time consuming.

The fundamental principle underlying the management of testicular torsion is that time is of the essence, with the chance of testicular survival diminishing as time progresses. Although occasionally reported, testicular survival after eight hours of torsion is extremely unlikely.

MANAGEMENT
Once referred for further assessment, if torsion cannot be excluded, the patient should undergo urgent surgical exploration. Radiological investigations are of questionable value since rapid diagnosis and prompt scrotal exploration determine testicular viability in the presence of torsion. However, the role of Doppler ultrasound is justifiable if the clinical picture is doubtful and an experienced radiologist is available. The presence of arterial flow on colour Doppler in this scenario can rule out torsion with an accuracy of 97 per cent.

Informed consent prior to surgical exploration should include counselling for removal or fixation of the affected testis depending on its viability, and for fixation of the contralateral testis should the diagnosis of torsion prove correct. It is necessary to warn the patient and/or his parents about the likelihood of an orchidectomy if the testis is found to be anything other than viable. The patient must also be warned that testicular loss will result in a degree of impaired fertility, although this will usually be compensated for by the female partner.

Typically testicular torsion is intravaginal, i.e., it occurs within the tunica vaginalis. Upon delivery of the testis, the twisted cord is readily apparent and the testis itself will be of a dark, dusky purple colour, the intensity of which will be dictated by the duration of the rotation (Figure 3).

Testicular torsion invariably involves a rotation towards the midline and can therefore be reversed by twisting the testis laterally for the required number of turns. The testis is then left to ‘pink up’ as first

KEY POINTS
- Testicular torsion is an emergency and requires rapid urological referral
- The patient almost always presents with pain of less than 24 hours’ duration
- Differential diagnosis includes torsion of testicular appendages and epididymitis
- Dipstix urinalysis is the only mandatory investigation and is typically negative
- If torsion cannot be excluded, the patient should undergo urgent surgical exploration
the venous congestion and then the arterial insufficiency is allowed to resolve. This may require up to 10 minutes wrapped in a warm saline gauze.

If there is any doubt regarding its viability, orchidectomy should be performed. Antisperm antibodies may form if a non-viable testis or one of doubtful viability is left within the scrotum and consequently the fertility of the remaining testis may be compromised.7

If the testis is deemed viable, a three-point testicular fixation should be performed using non-absorbable suture material. The contralateral testis should also be fixed to eliminate the risk of metachronous contralateral torsion. Orchidopexy is not indicated in the absence of torsion.8

Cosmesis may also prove to be an issue for the patient, but this is a personal thing and by no means universal. Some patients cope extremely well with the loss of a testis and have no negative psychological sequelae. Others will request the insertion of an artificial testicular prosthesis. This should be offered by the initial operating surgeon and may be performed immediately or at any stage in the future, as directed by the patient.

CONCLUSION
Testicular torsion is an emergency that all health professionals should be aware of. Knowledge of the mode of presentation and anatomy of the testes is the key to differentiate torsion from other causes of acute scrotal pain. When testicular torsion is suspected, immediate surgical exploration is mandatory.

REFERENCES

FURTHER READING