

Diagnosis and Management of Testicular Injuries

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Abstract

Testicular injuries are seldom because of the mobility of the testes and their anatomical position between the thighs, which offers them protection. They represent only a small percentage of traumatic injuries of the genitourinary tract. Etiologically we can categorize testicular trauma in blunt or penetrating. Treatment can be conservative or surgical. Significant haematocele indicates rupture of the tunica albuginea and should be treated with surgical exploration and repair. Treatment decision can be made with the help of real time ultrasonography or sometimes MRI and CT-scans of the testes. Hormonal function remains in most of the cases normal but hormone status should be controlled in complicated cases, which affect fertility and could require hormone replacement.

Keywords: Testicular injuries; Tunica albuginea; Testicular ultrasound; Orchidectomy

Introduction

Incidence and pathophysiology

Testicular injuries are seldom between the injuries of the genitourinary tract because of the protection offered to them by their anatomical position between the thighs and because of their mobility. Males between 15 and 40 years of age represent the most frequently affected group. According to the etiology testicular injuries are separated in blunt and penetrating, the first being the most common. Blunt testicular injuries can occur during sport activities especially full contact sports, assaults or traffic accidents mostly on bicycles and motorbikes. In most cases only the one of the testes is involved with only 1.5% of blunt testicular injuries involving both testes [1].

Penetrating testicular injuries occur as a consequence of assaults with gunshots or knives, war injuries, especially bomb blasts, straddle-type falls on sharp objects or in rare cases animal bites. They are in most of the cases associated with perineal, pelvic, or abdominal injuries [2].

The mechanism of injury in blunt trauma involves a blow forcing the testicle against the thigh or pubis with subsequent intraparenchymal bleeding. The rupture of the tunica albuginea which is the capsule in which the testicular parenchyma is situated, follows when the applied force exceeds 50 kg according to previous studies [3].

If the bleeding remains within the tunica vaginalis (another membranous structure surrounding the testicles) we speak about the formation of a haematocele. Breaking of the tunica vaginalis because of high intratesticular pressure and bleeding in scrotum forms a haematoma and an obvious enlargement of the affected testicle. Except blood there is also extravasation of testicular parenchyma in the scrotum.

Penetrating testicular injuries have a different mechanism as already mentioned and tetanus vaccination is mandatory with both active and passive immunization. Antibiotics should also be given for different periods of time depending on situation because of the risk of wound infection. Especially in case of animal bites (mostly dogs) vaccination against rabies must also be given [4,5].

Diagnosis

Patient history is alone enough to put the right diagnosis. Symptoms like pain, nausea, vomiting and sometimes fainting are the most common. Important is to remember that testicular trauma in minors could be an alarming sign of abusive assault (Figure 1).

On physical examination tenderness, swelling and ecchymosis of the hemiscrotum are always present. The testicles are not always easy to palpate especially in cases of big haematomas or in case of traumatic dislocation of the testicles for example in the inguinal region or rare in the abdominal cavity [6,7].

High resolution ultrasonographic evaluation (Figure 2) represents the first-line imaging modality in diagnosing suspected testicular ruptures with high specificity and sensitivity rates in cases of equivocal physical examinations. Characteristically features are the discontinuity of the echogenic tunica albuginea and heterogeneous echo pattern of the testicular parenchyma.

Color flow and duplex Doppler imaging helps assessing the testicular viability and perfusion. If inconclusive, testicular MRI or CT-scan may be helpful as second-line imaging modalities [8-13].

Although ultrasonography can distinguish various testicular injuries cannot be used alone for the diagnosis of testicular rupture [11]. In any case that imaging studies cannot definitively exclude testicular rupture and if clinically a tear of the tunica albuginea is suspected, surgical exploration is indicated [14,15].



Figure 1: Photograph shows bruised enlarged left hemiscrotum of a 33-year old man presented 2 hours after being kicked whilst practicing a martial art.

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Management

Insignificant testicular injuries without signs of haematocele or haematoma should be treated conservatively administering non-steroidal analgesics, local cooling with ice-packs and elevation of the affected testis in order to avoid pain and scrotal swelling [8]. Also in cases of blunt injuries with haematoceles smaller than three times the size of the contralateral testis, conservative management is recommended [16,17]. Every other injury should be treated with early surgical exploration and drainage of the haematoma or haematocele and excision of necrotic tissues [1] (Figure 3).

The surgical repair and closure of the ruptured tunica albuginea is mandatory. In cases of extended destruction of the tunica albuginea new technics describe the use of free tunica vaginalis flaps for testicular closure and preservation of the testicular parenchyma [18].

If traumatic dislocation of the testis occurs should be treated with manual replacement and orchidopexy in one or two stages (Figure 4).

Penetrating testicular injuries are more severe and often associated with injuries of other organs and structures necessitating more aggressive approaches. Surgical exploration with debridement of necrotic tissue or even orchidectomy, if the testis is no more viable are indicated. Antibiotics are recommended and tetanus prophylaxis is for penetrating injuries mandatory [6,19].

A delayed surgical management can lead to infection, chronic pain, testicular atrophy and impairment of hormonal function as long as in increased orchidectomy rates [8] (Figure 5).

Fertility impairment after testicular injuries is seen only in bilateral orchidectomies where testosterone substitution must be offered to the patients for life. In any other cases of unilateral orchidectomy fertility should not represent a problem in the future as long as the

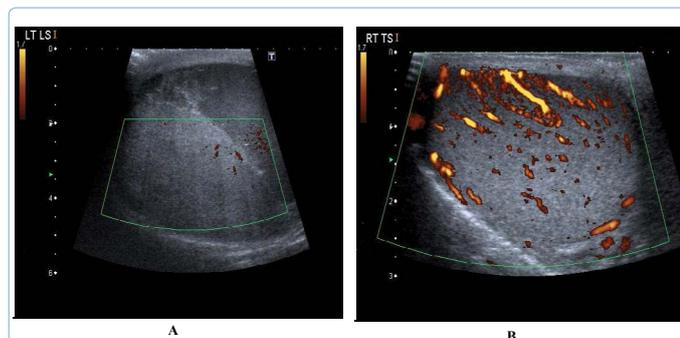


Figure 2: (A) Ultrasound shows left testicle with no flow on colour Doppler and tunica albuginea rupture as compared to (B), a normal right testicle with an intact capsule and healthy blood supply.



Figure 3: Intraoperative photograph shows split capsule with extruding haematoma.



Figure 4: Intraoperative photograph shows debrided haematoma back to healthy bleeding tissue.

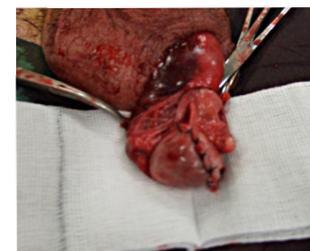


Figure 5: Intraoperative photograph shows capsular closure.

endocrinological function of the contralateral testis proves to be normal. If testosterone deficiency is suspected because of suggestive symptoms as low libido, decreased muscle mass and strength, gynecomasty and sometimes erectile dysfunction, semen analysis and hormonal determinations for testosterone, FSH and LH should be performed [20,21].

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