

Trauma and reconstruction

Bilateral testes fractures from blunt scrotal trauma

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ABSTRACT

Management of blunt scrotal trauma is classically centered upon evaluation of potential testicular ruptures to that expedient surgical intervention can be employed. We present a unique case of blunt scrotal trauma causing bilateral testes rupture in order to illustrate the rationale for societal guidelines. We additionally offer discussion of potential sequelae of afflicted patients and a sparingly used technique to salvage a severely injured testis.

Introduction

Blunt scrotal trauma is a rare event in the spectrum of trauma associated injuries of the genitourinary system. Patients may present with scrotal pain, swelling, and ecchymosis. Clinical evaluation and diagnosis may be challenging. Early scrotal exploration in cases of testicular rupture is thought to be associated with improved testicular salvage rates. Here we present a unique case of an adolescent presenting with blunt scrotal trauma to illustrate key factors in the evaluation, management, and counseling of afflicted patients.

Case presentation

A healthy 17 year old male lacrosse player was struck in the scrotum by a high velocity, passed ball. He was not wearing protective gear at the time. He immediately developed significant scrotal pain and temporarily left the game, but returned after a brief rest. At home, his scrotal pain worsened and he was directed to the emergency department by his pediatrician.

On exam, he had a small abrasion over the right hemi-scrotum without ecchymosis. The right scrotum was enlarged and bilateral testes were tender and firm. At rest, he was not in discomfort, having received ibuprofen just prior to exam. Scrotal ultrasound demonstrated normal arterial flow bilaterally, complex fluid collections surrounding both testes, and heterogeneous testicular echotexture bilaterally. The contour of both testes was lobulated and abnormal in appearance (Fig. 1).

At that time, a detailed discussion of options were presented to the patient and his mother. Options included immediate scrotal exploration and evacuation of hematoma under anesthesia versus overnight

observation with repeat imaging in the morning. Given absence of pain, somewhat equivocal ultrasound findings, and the patient's strong preference to avoid surgery, he was admitted for observation and repeat ultrasound. Not surprisingly, his repeat ultrasound demonstrated increased extra-testicular hematomas bilaterally. As such, he was brought to the operating room for scrotal exploration. The right testis suffered a large anterior fracture with extrusion of 30–40% of testicular parenchyma, which was debrided and closed in a running fashion. The left testis also sustained an anterior fracture with extrusion of 25–30% of testicular parenchyma, which was unable to be closed primarily even after debridement. A 3 cm × 3 cm tunica vaginalis flap was subsequently mobilized from the superior pole of the left testis proximally along the spermatic cord. This was sutured circumferentially to the tunica albuginea as an onlay (Fig. 2). The bilateral testes were replaced back within the scrotum in appropriate position. A drain was placed within the dependent portion of the scrotum, which was then closed in multiple layers.

Discussion

Ultrasound is often the first diagnostic tool beyond a physical exam that is used to evaluate blunt scrotal trauma given it is a non-invasive, expeditious, and essentially ubiquitous technology. Ultrasonographic findings which may help with accurate clinical diagnosis have been adapted from Wang and Fenton and are outlined in Table 1.^{1,2} In one of the larger published series, Buckley and McAninch retrospectively reviewed 65 patients with blunt scrotal trauma over a 25 year period and found that a heterogeneous parenchymal echo pattern with loss of testicular contour is highly sensitive (100%) and specific (93.5%) for testicular rupture or testicular torsion.³

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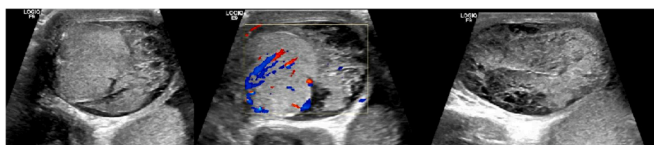


Fig. 1. Ultrasound images of right testis showing (from left to right): injured testis, Doppler view of injured testis, and right extra-testicular hematoma.



Fig. 2. Creation of tunica vaginalis flap over ruptured left testicle.

Table 1

Common ultrasound features found in scrotal trauma.

Diagnosis	Common Ultrasound Features
Hematocele	Acutely echogenic or isogenic fluid in potential space between parietal and visceral layers of tunica vaginalis
Testicular hematoma	Often focal abnormal hyperechoic lesion mimicking a neoplasm without internal vascularity on Doppler
Testicular fracture	Linear hypoechoic band with intact tunica albuginea, often coexists with hematoma
Testicular torsion	Decreased perfusion on Doppler
Testicular dislocation	Hemiscrotum with absent testis
Testicular rupture	Break in tunica albuginea with contour abnormalities, testis contour abnormality, heterogeneous testicular tissue, reduced perfusion on Doppler

Contrary to penetrating testicular trauma which invariably requires surgical exploration, blunt trauma can pose a clinical management challenge. Patients can present in a delayed fashion with unresolving or worsening testicular pain and swelling, making the urgency of the trauma unclear. Conservative management can be employed with confidence when the testicle appears unaffected and no significant hematocele is detected. However, in the event of a testicular rupture or large hematocele, scrotal exploration is warranted. Surgical exploration involves evacuation of the intrascrotal hematoma, debridement of ischemic non-viable tubules, and closure of the tunica albuginea defect. In the event the tunica albuginea cannot be primarily closed, as in our patient, the use of a tunica vaginalis pedicle or free flap has been sparingly reported in the literature as an effective way to close the traumatic defect.

Counseling young patients on the long term consequences of testicular rupture is underreported and controversial in the literature. One potential sequelae is testicular loss secondary to impaired perfusion and

resulting ischemic necrosis. Additionally, as the testicle is commonly considered a “privileged site” due to the unique blood-sperm barrier, it is thought that testicular injury can contribute to the development of sperm antibodies through ruptured seminiferous tubule exposure to the body’s immune system. Lin et al. identified twelve patients who previously underwent surgical testicular repair or unilateral orchiectomy for trauma and performed a semen analysis, sperm antibody assay, and gonadotropin stimulation test. In the group that underwent repair, sperm motility, density, and gonadotropin response were not found to be different compared to fertile controls. Only one patient had an elevated antisperm antibody titer. Of those who underwent simple orchiectomy, the authors found decreased sperm density with elevated follicle stimulating hormone and luteinizing hormone levels.⁴ Conversely, another review of eight patients who underwent repair after testicular rupture showed normal hormonal status, but did find clinical subfertility and one patient with antisperm antibodies.⁵ The limited available human data seem to suggest a low incidence of either infertility or sperm antibodies following testicular injury. We would argue that preservation of testicular parenchyma to reduce testicular atrophy or loss may be more important. As such, these patients would likely benefit from follow up ultrasonographic doppler evaluation to assess viability to improve counseling on future fertility and endocrine function. Patients should be counseled on the potential of testicular rupture to lead to clinical subfertility in rarely reported cases, however no additional testing or workup beyond that recommended by established guidelines for the unaffected male is warranted.

Conclusion

Blunt testicular rupture is a rare event that warrants rapid diagnosis and prompt surgical repair to maintain viable testicular tissue. Ultrasonography is the gold standard diagnostic tool with excellent sensitivity and specificity. Scrotal exploration should be utilized in cases with high clinical concern for rupture even with ambiguous radiographic findings. A tunica vaginalis flap can be considered to augment difficult repairs and thereby avoid significant testicular debridement, parenchymal loss, or orchiectomy. Sequelae of repaired testicular rupture, especially with regard to fertility, are not well understood.

Declarations of interest

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