TESTICULAR RECONSTRUCTION AFTER TESTICULAR RUPTURE AND REVIEW OF THE LITERATURE

Roberto Ballestero, Miguel Angel Correas Gomez, Pedro Lastra Garcia-Baron, Jose Antonio Portillo Martin, Sergio Zubillaga Guerrero, David Truan Cacho, Jose Ignacio Del Valle Schaan, Carmen Aguileras Barrios, Antonio Roca Edreira, Jose Antonio Campos Sanudo, Emma Hidalgo Zabala, Felix Campos Juanatey, Lucia Gala Solana and Jose Luis Gutierrez Baños.


Summary.- OBJECTIVE: To report a clinical case of testicular rupture and review of the literature published.

METHOD: A 15 years old male with a testicular rupture after a sports injury was diagnosed by Doppler ultrasound.

RESULTS: Surgical exploration was performed and the tear was repaired. He had a benign postoperative course. The patient presents a normal size testicle after a year of follow-up.

CONCLUSIONS: Testicular rupture is an uncommon but important entity that may occur. It is essential early diagnosis and management to avoid orchiectomy.

Keywords: Testicle. Rupture. Traumatism.

INTRODUCTION

Testicular rupture is an uncommon injury because of the location and mobility of the testis and the tunica albuginea protection (1). Early repair has traditionally shown better results in the orchiectomy rates and better comfort in the days after the trauma than conservative management. We report a case of testicular repair and present a review of the literature.

CASE REPORT

A 15-year-old boy was kicked directly in the scrotum playing football. He complained of immediate and intense pain in left scrotum with irradiation to inguinal area, but was brought to the emergency department 12 hours after. His examination revealed a swollen left hemiscrotum, left haematocele and an exquisitely tender left testicle. Transillumination in the left scrotum was negative whereas right testicle was completely normal.

Blood analysis revealed normal. Scrotal ultrasound demonstrated a moderately haematocele and heterogeneous appearance and contour discontinuity of left testicle. These findings were thought to be consistent with testicular rupture. (Figures 1 and 2). Arterial testicular flow to the left testicle was diminished, limited to the medium and inferior testicular pole.
Intraoperatively, haematoma was drained and testicular fracture was noted. It was observed a transversal laceration involving the lower third of the left testicle with extrusion of seminiferous tubules, which were excised (Figures 3 and 4).

Vaginalis tunica was closed with a polyglycolic acid suture in a continuous fashion. (Figures 5 and 6). The patient had a benign postoperative course being discharged on the following day.

He was followed up at 3 and 12 months post-repair and reported no residual symptoms, with a normal testicular examination. Ultrasound demonstrated a slightly smaller testicle with and hypoechoic area in the superior testicular pole. It revealed a working area of about 50%.

DISCUSSION
Testicular rupture is defined as the fracture of the tunica albuginea with extrusion of the seminiferous tubules. However, scrotal trauma continues to be an under-diagnosed pathology. Either because they are light injuries or because they are considered as an embarrassing situation, yet many cases are not communicated.

It must be pointed out that an important delay following the scrotal trauma and the urological diagnosis is common, such as it happens with our case. The reason for this delay is that the patient tries to get back to his usual life after a resting period (2,3).

Most of blunt testicular traumas are: Sports-related (50% of blunt traumas) and caused by traffic accidents.
(9-17%), varying in the order according to different series. Other cause is due to assaults involving violence (1,3-8).

Commonly to animal or human bites and self-mutilations (6). Testicular trauma most commonly occurs in young men between the ages of 15 and 40 years (2,3,5). Most of testicular ruptures are caused after blunt traumas.

Although not life threatening, sequelae of testicular rupture are frequent and they should be taken under consideration. Testicular atrophy could lead to an impaired spermatogenesis or altered hormonal production, as well as to an obstruction of the deferent duct which may cause secondary infertility.

In addition, the possibility of scrotal infection and severe pain after the trauma, which can remarkably delay the return to work or school, should make us consider the diagnosis of testicular fracture after any testicular trauma (3,9).

Traumatic rupture of the testis follows blunt trauma to the scrotum when the testis is forcibly driven against the pubic arch, something that usually happens.

This initial compression of the testis is followed by an explosive disruption with extrusion of the seminiferous tissue through the torn tunica albuginea (1,2,10).

Protection mechanisms of the testicle include: the mobility of the testicle, the tough capsule (tunica albuginea) as well as the retraction due to cremaster muscle contraction. A contusion can cause bleeding into the tunica vaginalis sac (haematocele) or bleeding within the testicular tissues (infratesticular or subcapsular haematoma). A tear in the tunica albuginea allows blood and seminiferous tubules to extrude into the tunica vaginalis sac (5,10).

The orientation of the tear was described by Schuster et al. They reported a 58% of transversal orientation, 21% of longitudinal orientation, multiple or stellate tear in 8%, avulsion of a pole in 6.5% and internal haematoma in 6.5% of the cases (1).

The major physical findings, like in our report, are extreme testicular tenderness and pain during palpation, edema and scrotal ecchymosis. Frequent haematocele and scrotal inflammation make the exploration of the testicle difficult, which sometimes may lead to an inconclusive diagnosis (1,3,8,9,11).

However, some authors defend that the absence of inflammation does not exclude the testicular rupture because there are cases with little haematocele or even absence of testicular inflammation associated with rupture of the tunica albuginea (1,8).

Testicular rupture is based on the single echographic finding of a heterogeneous pattern of the testicular parenchyma with a loss of contour definition (9). Classically, the older series were based in the visualisation of the fracture of the tunica albuginea. However, this finding showed low sensitivity and specificity, so ultrasound scan was a predictive tool but did not play a decisive role for considering the therapeutic approach (2,4,5,10,12).

Better results have been achieved as the ultrasound units have improved. An example of this is that recent reviews show sensitivities and specificites above 90%, which gives the Doppler ultrasound a key role in diagnosis of testicular rupture (3,6,7,9,10,13-16).

An important aspect is to determine the criteria that various authors use for the diagnosis of testicular rupture. Ho Kim and cols show the outline irregularity as the standard that provides a higher accuracy for the diag-
nosis of testicular rupture. To a lesser extent, they consider intratesticular heterogeneity echoes (15). Kim and cols assert that authors that took this criterion, have higher diagnostic security rates, compared to older series that looked for the line of fracture (7,14). Other authors have subsequently confirmed this statement (9,16).

Before 1968, the incidence of testicular rupture was unknown because most patients were treated in outpatient clinics and in a conservative way. The care of these patients changed from the "wait and see" approach to the current surgical management. Gross and cols showed for the first time the importance of an early surgical repair in 1968 (17).

Subsequently, Cass and cols (1983) provided a review of 20 years of experience comparing conservative management (before 1971) and early surgical treatment. They found an orchiectomy rate of 45% in the first group compared with 9% in the surgical management group. This is the base of the current handling of the testicular rupture (18). Later other authors have remarked this attitude, showing the high orchiectomy rate with conservative management (1-3,10,12,13).

Conservative management produces a high rate of testicular atrophy which can lead to a decrease in spermatogenesis and affect male fertility. Another problem is the patient's or parent's emotional involvement with the loss of a testicle.

Economically the conservative management leads to a longer hospital stay, higher morbidity rates, as well as a longer convalescence period until the return to normal life (3,12).

It is from this perspective that a lot of authors have defended in the literature the advantages of early surgical exploration, in addition to the falling of the orchiectomy rates: faster recovery of the pain, an early return to work or school, better bleeding control, theoretical prevention of the anti-sperm antibodies and preservation of the spermatogenesis, as well as shorter hospital stay (7,8,12,14,16). A small study of Linn and cols concludes that patients with testicular repair did not present seminal or endocrine anomalies compared with patients with orchiectomy, that presented a significant decrease of the sperm density and elevation of the LH and FSH (15).

The surgical technique consists of a transverse incision in the lower third of scrotum of the affected testicle. After opening the tunica vaginalis, the hematoma is drained and the entire surface of the tunica albuginea is inspected. The rupture site is easily identified with extruded seminiferous tubules. Sharp desbridement of the necrotic, non-viable tissue is performed until healthy bleeding edges are encountered. The remaining tunica albuginea is closed with a small absorbent suture in a continuous fashion. The testicle is placed back into the scrotum in its natural lie and a two-layer closure of the scrotum is performed with absorbent suture, after placement of a penrose drain type. Anti-inflammatories and scrotal elevation are recommended thereafter.

Orchiectomy is reserved for complex ruptures where repair is not possible or for critical patients where the testicular reparation is not the priority (5).

Another important aspect is the delay in diagnosis from injury production to hospital care. This delay has resulted in a higher orchiectomy rate. Chandra and cols consider a rational approach the conservative management of patients with testicular rupture if there is a delay of more than 72 hours, due to decrease in the testicular salvage from 90 to 30%. However, Buckley and cols believe that it is mandatory to explore all testicular ruptures with the intention of saving the testicle, although in their study they just could save 1 out of 5 cases who presented with a delay of more than 72 hours (4,5,17). Currently the conservative management after a testicular rupture is unjustifiable (5,14).

Buckley set the indications for surgical exploration after a blunt scrotal trauma: suspicion of testicular rupture, larger than 5 cm or expanding haematocoele, scrotal skin loss, or testicular avulsion. In haematocoeles smaller than 5 cm, conservative treatment with ice, elevation, non-steroidal anti-inflammatory drugs and pain control are indicated (5,14). There is agreement in the conservative treatment of the scrotal wall haematoma. A controversial issue is the attitude toward intratesticular haematomas, although authors as Chandra and Kratzik advocate conservative measures (8,13).

With testicular reconstruction, several papers have shown testicular preservation rates over 80%. Buckley has 83%, Altarac has 86% and Hoon Lee 82%, which supports the above criteria (4,5,7).

In our case we present a normal size testicle after a year of follow-up. A limitation that it is found in the literature is the briefness or absence of long-term follow-up in these patients. Guichard has a 72% of follow-up of the overall testicular trauma, one of the longest rates that has been published, though it is only limited to describe the general effects (16). Hong Lee has a one month follow-up of 82% with 64% of normal size testicle, while 3 out of 17 cases presented a complete atrophy and 3 other cases presented intermediate degrees of atrophy (7).

This lack of long-term follow-up limits the knowledge of the evolution of the functionality of these testicles, since there are different degrees of atrophy.

Therefore, although there are multiple data of testicular preservation after acute injury, it would be interesting to consider the feasibility of the repaired testicles, both
their morphology and their seminal and hormonal function.

It is essential the education of young athletes on the possibility of testicular injuries, its consequences and the way of avoiding them using protective sport equipment, since sport injuries are the most frequent cause of these testicular trauma.

CONCLUSIONS

Testicular rupture is an uncommon but important entity that may occur. It is essential early diagnosis and management to avoid orchiectomy. Also we must educate young athletes on the prevention of these injuries.

REFERENCES AND RECOMMENDED READINGS

(*of special interest, **of outstanding interest)


