

Testicular Rupture in Professional Baseball Outfielder

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Abstract

Background: Athlete is a 25-year-old (76 inches and 222 lbs) professional baseball player who was hit in the testicles while diving for a fly ball. He reported that the ball struck him directly without first hitting the turf. Extreme pain and nausea from impact caused him to leave the game. Initial exam revealed no initial swelling or deformity. He reported pain to be a 7 out of 10 on the pain scale. Athlete has no past medical history. **Differential Diagnosis:** Evaluation revealed suspicion of testicular contusion, testicular hematoma, testicular rupture.

Treatment: Injury was initially treated with rest from activity. He did not finish the game, nor did he play the next day. However, pain and swelling increased on the right testicle. A scrotal support was used as a sling in attempt to relieve the pain but made minimal improvement. Significant testicular damage was not suspected, so athlete was allowed to lightly jog. A testicular ultrasound was scheduled with the local team physician to rule out serious damage. He received a testicular ultrasound to reveal a right-sided testicular rupture with disruption of the tunica albuginea and a large hematocele. Athlete was referred for right scrotal exploration. Following surgery, the athlete took a four-week break from activity. Upon returning to activity, he progressed his functional activity in the weight room and on the field. In circumstances like a testicular rupture repair, normal rehabilitation is not needed, as the testicles do not play a role in the athlete's ability to play baseball. Within three weeks of progressed activity, he successfully returned to game play without complaints or issues.

Uniqueness: In athletics, scrotal injuries account for less than 1% of patients with traumatic injuries. Testicular ruptures account for 50% of blunt scrotal trauma injuries. In order for a testicular rupture to occur, about 50 kg of direct force needs to be administered to the scrotum. Rehabilitation for athletes with this injury is different than a musculoskeletal injury. The rehabilitation process consists of returning the athlete to functional movements post-operation. If their pain and swelling are managed, they are not limited to activity.

Introduction

Testicular ruptures are a rare injury to occur in athletic, especially in baseball. Scrotal trauma accounts for less than 1% of all trauma related injuries with peak occurrence at ages 10 to 30 years. With this, testicular ruptures are extremely difficult to diagnose. Imaging is usually required to determine diagnosis, but even imaging can miss the rupture of the hematocele causing the correct diagnosis to be delayed. When diagnosis of a testicular rupture is delayed, the following information will explain the mechanism of injury, clinical assessments, radiographic gold standards and findings, diagnosis, treatments and return to play to provide additional information to this athlete's unique injury.

Purpose

The purpose of this case report was to introduce a 25-year-old professional baseball athlete who received a testicular rupture during competition. Testicular ruptures are difficult to diagnosis due to the poor quality of imaging used. The purpose of this case is to provide more insight to health care professionals and athletes on the most effective way to diagnose a testicular rupture when blunt scrotal trauma occurs during athletics. An overview of this unique injury is presented to obtain additional information and a better understanding regarding the complete injury of a testicular rupture, as well as how to properly and promptly diagnose the injury.

Anatomy

Testicular rupture, is defined as the rupture of tunica albuginea, accompanying with extrusion of scrotal contents. Within the scrotum, the testes are encased within the tough layer of the tunica albuginea. Surrounding this covering is the thin tunica vaginalis, a serous layer embryologically derived from the processus vaginalis of the peritoneum. A contusion to the scrotum can result in a hematocele, which is bleeding outside the tunica albuginea but within the layers of the tunica vaginalis. When the inelastic tunica albuginea ruptures due to trauma, the testicular parenchyma may extrude into the scrotal sac. This defines testicular rupture, which should be differentiated from testicular fracture.

Case Report

Patient: This professional baseball player is a 25 year-old (104 kg and 185cm) athlete that received direct impact to the groin during competition. The following information will explain the mechanism of injury, clinical assessments, radiographic findings, diagnosis, treatments and return to play to provide additional information to this athlete's unique injury.

Mechanism of Injury: Knowing that testicular ruptures occur following blunt force trauma, they typically occur while playing sports or during a motor vehicle accident. According to Wang et al., studies reveal that about 50 kg direct force would cause testicular rupture. In this case, the athlete reported taking a blow to the scrotum from a fly ball in the outfield. The ball struck him directly while he was diving. Impact was direct and did not hit the turf before hitting his scrotum.

Initial Examination: Athlete removed himself from play following the direct blow. He was unable to continue playing due to the extreme pain and nausea experienced. After removing himself from the game, he was instructed to perform a self-evaluation to determine the extent of the injury. He reported no initial swelling or defect despite the pain. **Initial Treatment:** To monitor signs and symptoms, athlete did not return to play on the same day of the injury. He also did not play the following day.

Physician Examination: Two days after the mechanism of injury, athlete had an increase in signs and symptoms that required an immediate referral to the nearest team physician. Pain was described as dull and aching with radiation to the right lower abdomen. The doctor noted that the right testicle was approximately twice the size of the left testicle with marked tenderness. Athlete had discomfort with walking, but no issues urinating and reported no blood from the meatus. An ultrasound was ordered for the next day. He was instructed to wear a scrotal support to manage pain.

Radiographic Findings: Three days after the mechanism of injury, a diagnostic ultrasound was performed on the athlete's right testicle. Imaging revealed a right-sided testicular rupture with disruption of the tunica albuginea with contour abnormality and a large hematocele. No definite blood flow was seen in the extruded testicular parenchyma.

Diagnosis and Treatment: Once the diagnostic ultrasound was read by the radiologist, a phone call was made to the athletic trainer of the athlete. They were instructed to immediately go to the emergency room to receive care from urology. The diagnosis of the athlete was a right-sided tunica albuginea testicular rupture with a hematocele. Athlete underwent a right scrotal exploration the same day the ultrasound was performed. After the surgery, a follow-up ultrasound was performed. It revealed that the testicle was well healed with minimized echogenicity of the hematocele compared prior to the operation.

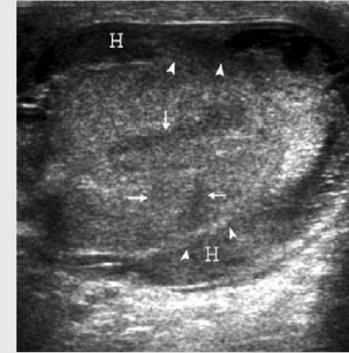


Image above shows the right-sided testicular rupture with hemocele. The arrowheads point to the indistinct testicular contour of the tunica albuginea. Arrows point to the fracture lines of the testicle. The (H) represents that hematocele surrounding the testicle.

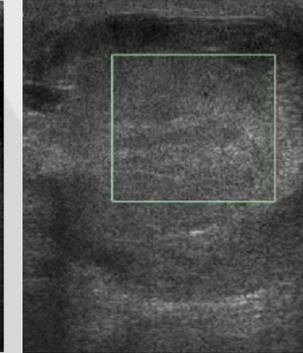


Image above shows the lack of blood flow to the extruded testicular parenchyma.

Rehabilitation and Results

Following the surgery, the athlete was required to take four weeks off from activity. This time frame allowed the repair to the right testicle to heal properly without possible disruption that can occur with activities such as running. Four weeks post-operation, the athlete had no swelling or pain, so he was cleared for all activities. Since the testicle is not a muscle, it does not have to be rehabilitated the same way as a musculoskeletal injury. If signs and symptoms remain controlled, post-scrotal exploration athletes are not limited in activity. This is a unique rehabilitation criteria can become difficult as there are no clear guidelines.

In this case, the athlete began his first week with re-integration into the weight room. He started with full upper body lifting activities and modified lower body lift. Modified lower body lift consisted of limited weight, but no restricted movement patterns.

Week two of rehabilitation consisted of returning the athlete to on-land running activities. He began running progressions every other day at 50% strides, consecutively followed by 90% strides, lip runs, and base running. The athlete was also able to fully integrate into the weight room with no weight or movement pattern restrictions. During this time, the athlete started his lower body plyometric progression in the weight room, as well as returning to team stretch. He also was able to begin baseball activities. Defensively, he was able to play unrestricted catch. Offensively, he participated in hitting off the tee and hitting off front toss by a coach.

For the last week of rehabilitation activities, the athlete returned to all baseball activities. He was able to participate in outfield activities, as well as hit off the machine and live pitchers with no restrictions.

All of these activities and progressions were completed by the athlete without an increase in signs or symptoms, which allowed him to advance through the process in a timely manner.

Discussion and Summary

Testicular ruptures are very rare injuries that occur in sports and are can be easily misdiagnosed. These injuries can occur in all sports that produce collision and possible direct forces of over 50 kg to the scrotum. If a testicular rupture goes misdiagnosed, patients can experience complications such as infertility, delayed orchidectomy, and infection. Most testicular injuries present with the same signs and symptoms, so it is crucial to refer the athlete to get imaging to rule out extreme damages such as a testicular rupture. The gold standard for diagnosing a testicular rupture is diagnostic ultrasound. However, there are varying sensitivities and specificities for diagnostic ultrasound in accurate diagnosis of testicular ruptures. Chandra (2007) concluded that if a hematocele is present, the patient should undergo scrotal exploration without ultrasonography, as the study found a high correlation between a hematocele being present with testicular ruptures. This is an important aspect to note in correlation with athletes sustaining scrotal injuries to prevent misdiagnosis and possible complications. Further research is needed to establish a more accurate, yet non-invasive gold standard diagnostic procedure for testicular ruptures.

In this case, the scrotal injury was assessed and handled properly. The testicular rupture was diagnosed quickly and efficiently to prevent the athlete from having complications and further delay of his athletic career. The uniqueness of this athlete was the overall percentage of testicular ruptures that happen in an athletic setting. Scrotal injuries represent only 1% of all traumatic injuries in sports. From this, it is important to note that while the odds of a scrotal injury occurring are low, testicular ruptures account for 50% of the scrotal injuries that occur. So, when an athlete sustains a traumatic force to the scrotum, a testicular rupture must be ruled out prior to returning to play.

From the initial onset to full functional return to play, the athlete followed a rehabilitation protocol created by the sports medicine and strength staff where the time lost resulted in only 51 days. Most of the time lost for the athlete happened due to the recovery time needed post-operation rather than a lengthy rehabilitation process. The overall rehabilitation process after being cleared for full activity only lasted 24 days. Understanding that a testicular injury is unlike a musculoskeletal injury is vital to return the athlete to play as soon as possible. Most musculoskeletal injuries require the athlete's rehabilitation process to be the same number of days that the athlete was down. For testicular ruptures, they can be advanced quicker with less restrictions due to the minimal chances of reinjury. After an athlete sustains a traumatic testicular injury, it is also important to recommend that they take precautions such as wearing a cup to prevent another incident from occurring.

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