

CASE REPORT

Pediatrics

Point-of-Care Ultrasound detecting testicular rupture in pediatric emergency

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Abstract

Acute scrotal pain is a true emergency that needs to be identified, diagnosed, and managed quickly to avoid any testicular tissue loss. In pediatric emergency, testicular torsion has been the most worrisome diagnosis that needs to be included or excluded as fast as possible. Point-of-care ultrasound (POCUS) has been reported to be a game changer. However, because testicular rupture is an extremely rare entity in the pediatric age group, there are limited reports about POCUS use in diagnosing the condition. We describe a case of a 4-year-old boy who presented with acute scrotal pain secondary to trauma 2 days previous, where POCUS was able to identify and diagnose testicular rupture in a timely fashion that facilitated management and intervention.

KEYWORDS

pediatric emergency, pediatric surgery, pediatric, POCUS, testicular rupture

1 | INTRODUCTION

Acute scrotal pain is one of the common presentations in emergency departments (EDs).¹ Testicular torsion is the first differential of time-sensitive emergencies in any acute scrotal pain presenting as a pediatric emergency. Ultrasound has been used for diagnosis since the 1970s.² Testicular point-of-care ultrasound (POCUS) has been a well-established niche in POCUS and especially for POCUS-trained pediatric emergency physicians. Studies show the variation of how sensitive and specific ultrasound can be. Scrotal POCUS performed by emergency-trained physicians reaches a sensitivity of 95% and a specificity of 94%.³ Testicular trauma is a common cause for acute scrotal pain with the most common mechanism being blunt injury secondary to sports, straddle, and assault injuries.⁴ Testicular rupture that can result

from blunt trauma is a rare complication to testicular trauma, particularly in pediatrics.⁵ Testicular rupture is a urological emergency that requires immediate surgical evaluation and intervention.⁶ In this case report, we demonstrate how scrotal POCUS is a tool to diagnose and channel patient care in the right track in a timely manner.

2 | CASE PRESENTATION

A previously healthy 3-year-old boy presented to the pediatric ED complaining of testicular pain, swelling, and redness for the past 7 hours. This was preceded by a blunt trauma when he was running and crashed into a kitchen cabinet. This was managed at home initially with pain killer. The next day, the pain was more pronounced, so he was taken to

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FIGURE 1 Heterogeneous left testicular tissue. Double arrow showing multiple hypoechoic areas representing intratesticular hematoma. The single arrows identify the disruption of tunica albuginea. Star shows hematocele

a primary health care center where his mother said it was “inflamed.” She was given ibuprofen to administer for pain management.

On the day of presentation, the patient was restless during sleep and woke up due to severe pain in the early morning. His mother gave him ibuprofen, and he calmed down and slept a bit. A few hours later, he woke up complaining of pain. On examination, his mother found his scrotum to be more swollen and redder than before.

The patient presented to our ED. He was clearly uncomfortable. On examination, aside from the discomfort, his vitals were normal. His abdominal exam was normal including inguinal area. On examination of genitalia, it was obvious that the left scrotum was larger, redder, and very tender on palpation. The testicle was palpated, and it was hard, fixed, and bigger compared to the right one. The cremasteric reflex was absent on the left side compared to the right one. There was no penile swelling or urethral discharge.

An intravenous line was inserted, and morphine given to relieve his pain. A POCUS was performed by a POCUS-trained attending pediatric emergency physician. The physician noticed that the left testis was large and heterogeneous with disfigured anatomy surrounded with hematoma. The flow was normal. The right side looked absolutely fine with a normal flow.

The initial diagnosis of left testicular rupture was made based on POCUS. While the patient was sent to the radiology department for a formal ultrasound to confirm the diagnosis, the pediatric urology team was contacted to prepare the patient for surgical exploration and the anesthetist was informed to prepare the theater room.

The patient was taken to the operating room by the pediatric surgery team for left scrotal exploration. They found testicular hematocele that was evacuated and irrigated with warm normal saline. There was a small tear in the tunica albuginea at the lower pole of the

testis that was primary repaired with absorbable sutures and another tear at the epididymis–testicular junction causing partial dissociation that was re-approximated with absorbable sutures. The patient had uneventful post-operative recovery and was discharged the next day in good condition.

3 | POCUS TECHNIQUE AND FINDINGS

With the patient in supine position, using a high frequency, 14-Mhz, linear probe started examining the right (unaffected side) to familiarize the child with procedure and decrease anxiety. The right testicle was visualized and showed homogenous texture, anatomy, and good flow on Doppler. The left testicle was enlarged with heterogeneous texture representing intratesticular hematoma, disturbed anatomy, and discontinuation of the tunica albuginea and hematocele (Figure 1). We also noticed that the tissue is herniating out of normal anatomic plane at some views (Figure 2). On Doppler, the flow was fine. Unfortunately, we could not get both testicles in 1 view due to the massive swelling and discomfort the patient was experiencing at this point.

4 | DISCUSSION

Testicular rupture in children is very rare due to the small size, mobility, elasticity of the testis, and protective cremasteric reflex.⁷ Testicular trauma can lead to edema, hematoma, torsion, fracture, and rupture. Because of swelling and severe tenderness, clinical examination can be challenging and may not reveal much. This makes POCUS of great value in differentiating between these entities facilitating the right timely



FIGURE 2 Heterogeneous left testicular tissue with multiple hypoechoic areas representing intratesticular hematoma. The arrows identify the disruption of tunica albuginea. Stars show testicular tissue herniating out of plain

management, especially since ultrasound sensitivity can reach 100% and specificity of 93% in testicular rupture⁸ and sensitivity and specificity between 94% and 96% in diagnosing other entities like torsion, orchitis, and hydrocele.^{3,8}

The most common finding of testicular rupture on ultrasound is heterogeneous echogenicity and irregular testicular contour. A break in the continuity of the tunica albuginea confirms the diagnosis. However, this is seen in only 17% of cases.⁹ Another suggestive feature is a large hematocele (>5 cm). Note that 80% of cases with a large hematocele have a testicular rupture not detected on ultrasound.¹⁰

Testicular rupture is an emergency requiring instant diagnosis and intervention. Eighty percent of cases can be repaired successfully and the testicle salvaged, if the surgical intervention takes place in the first 72 hours. With delayed repair (>72 hours), the salvage rate decreases from 90% to 45%, and the risk of ischemic necrosis and infertility increases.⁶ In our search, we found 2 articles describing cases of pediatric testicular rupture. One article was a case series of 4 patients, and the second article was a case report of a single case. The 5 described cases were for adolescents (the youngest was 13 years of age and the eldest was 16 years of age).^{6,11}

To our knowledge, this is the first report of a testicular rupture in a child where POCUS was able to identify the pathology and thus facilitate proper referral, management, and intervention.

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