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Case Report

Isolated extratesticular hematoma from intraoperative positioning during lumbar spinal surgery[☆]

Sunny Qi-Huang, MD^{a,*}, Anthony Danilenko, DO^a, Carlton Watson, MD, MS^b, John Krumenacker, MD^a

^a Department of Radiology, Nassau University Medical Center, East Meadow, NY, USA

^b Department of Surgery, Nassau University Medical Center, East Meadow, NY, USA

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ABSTRACT

Scrotal injury is present in less than 1% of all trauma-related injuries. Traumatic injuries of the scrotum are most commonly seen in penetrating or blunt injury but may also occur after iatrogenic causes such as in the intraoperative setting. We report a case of an isolated extratesticular hematoma incurred after scrotal trauma from prone intraoperative positioning during lumbar spinal surgery. Ultrasound performed following the procedure revealed an extratesticular hematoma without evidence of coexisting testicular injury. This case highlights an atypical insult to the scrotum and reinforces the need to ensure adequate positioning to prevent this postoperative complication.

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Introduction

Scrotal injury is present in less than 1% of all trauma-related injuries. It is most frequently caused by penetrating or blunt injury but may also occur after iatrogenic causes [1,2]. The male genital system is protected from most injuries by the mobility and elasticity of the scrotum from a tough covering layer of tunica albuginea and contraction of the cremasteric muscle [3]. Traumatic injuries can occur when the intrascrotal

contents are impacted with high velocity objects, or forcefully compressed against rigid surfaces such as the pubic bones [3]. In cases of compression injury such as ours, the right testis is more likely to be trapped between the offending agent and the inner thigh or pubic bone. This is due to the right testicle being anatomically higher in level than the left [1,4,5]. The injuries vary in severity and include scrotal contusion, hydrocele, testicular fracture, testicular rupture, and scrotal hematoma or hematocele [1,2]. To the best of our knowledge, intraoperative scrotal trauma is rare with a paucity of literature illustrating its significance.

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* Corresponding author.

E-mail address: sunny.qi@gmail.com (S. Qi-Huang).

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Fig. 1 – Longitudinal gray-scale ultrasonography image of the right testis (RT) demonstrating an approximately 3 × 1.7 × 3 cm ill-defined heterogeneous paratesticular mass within the right scrotum consistent with a hematoma (H)

Case summary

The patient is a 33-year-old male admitted following a frontal impact motor-vehicle accident. On impact, the airbags were deployed, and the patient had head injury with loss consciousness for approximately 10 minutes. He had a mild headache and moderate pain in his lower back, radiated down to the left leg. Examination was significant for a small forehead bruise, lower lumbar paraspinal tenderness and the patient's inability to raise the left lower extremity more than 6 inches off the bed secondary to the pain. He had no loss of strength with plantar and dorsiflexion and sensation was intact. Initial computed tomography (CT) revealed an acute traumatic pseudoaneurysm of the thoracic aorta and acute traumatic subluxation of L5 on S1 with fracture of the left L5 transverse process. Magnetic resonance imaging showed severe spinal canal narrowing at L5-S1 with soft tissue edema and hematoma along the left L5 neural foramen and expansion of the traversing left L5 nerve indicative of nerve injury. The patient was admitted and taken to the angiography suite, which the pseudoaneurysm was repaired successfully with an endovascular graft stent. No other complications occurred during the procedure. The genitourinary physical exam was documented as intact. After a period of 24 hours to ensure cardiovascular stability, the patient was scheduled for a lumbar spine surgery. Following the third day of admission, the patient taken into the operating room for posterior lumbar decompression with fusion, and skin flap reconstruction by neurosurgery and plastic surgery services, respectively. The patient had a Foley catheter in place. After successful induction of general anesthesia and endotracheal intubation, the patient was positioned prone on

a spine frame on a Jackson table. It was documented that all pressure points were padded adequately. Following the conclusion of the neurosurgical portion of the procedure, plastic surgery entered the operating room for the complex wound closure. The total procedure time was 5 hours. At the end of the procedure and reposition of the patient, it was noted the scrotum was trapped between the right thigh and the operating showing scrotal discoloration without signs of necrosis or infection. The on-call radiologist was contacted to perform emergent ultrasonography of the scrotum to exclude testicular injury.

Imaging findings and diagnosis

Real-time ultrasound of the scrotum was performed utilizing a high-frequency 12 MHz linear transducer. Longitudinal and transverse gray scale imaging revealed a 3 cm complex heterogeneous mass superior to the right testis (Fig. 1). Color doppler imaging showed blood flow around the mass but not within it (Fig. 2) most consistent with an extratesticular hematoma. Both testes were intact with preserved blood flow thereby excluding torsion and rupture. The relatively increased blood flow in the capsular and centripetal vessels of the right testis as compared to the left testis was likely due to reactive hyperemia from the compression injury. Differential diagnoses included epididymal hemorrhage, epididymal torsion, testicular rupture or scrotal pyocele.

The patient was diagnosed with extratesticular hematoma based on the history of intraoperative compression injury and the ultrasound findings in the immediate postoperative pe-

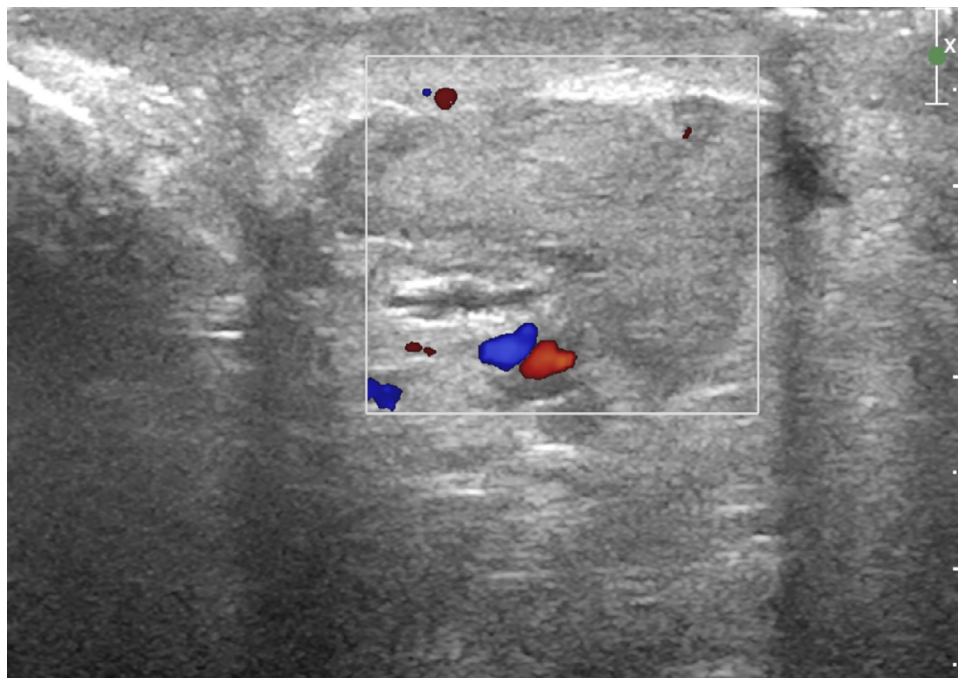


Fig. 2 – Longitudinal US image shows no internal flow on the color Doppler image, findings compatible with an extra testicular hematoma

riod. He was managed expectantly with ice, analgesics and scrotal support. In addition, he received hyperbaric oxygen therapy of 2.4 atmospheres absolute (ATA) x 90 minutes with 100% oxygen and two 5-minute air breaks as treatment for both the spinal skin flap and the scrotal injury.

The remainder of the patient's hospital stay was uneventful, with no further complaints of scrotal pain or increased scrotal swelling. On postoperative day 3 of lumbar spine, follow-up scrotal ultrasonography revealed a decrease in the size and echogenicity of the hematoma, better definition of the previously obscured right epididymis, and a normal right testis (Fig. 3). One week later he was clinically improved with resolution of the scrotal pain and decrease in the scrotal swelling and subsequently discharged. Vital signs were normal.

Discussion

An adequate intraoperative positioning of the patient plays a significant role to ensure proper access to the surgical site and not compromising anatomical structures. Prone positioning is frequently utilized in spinal surgery for access to the dorsolumbar-sacral spine [6]. However, a number of complications associated with the prone surgical position have been described. A systematic review of the literature by Kwee and colleagues of 53 articles highlighted the potential complications from prone positioning due to increased pressure to the anterior anatomic structures [7]. Direct compression injury on the operating table leading to lower limb compartment syndrome and nerve palsies have also been described [8-10].

There are multiple practice recommendations and guidelines regarding the necessary precautions to prevent injury to the male genitalia in the perioperative setting [11-14]. In our case, it is unclear the exact point in time during the procedure the scrotum was injured. Despite adherence to the guidelines, the history and examination strongly suggested the right testis inadvertently became trapped between the inner thigh and the operating table resulting in compression of the scrotal tissues and hematoma formation.

Ultrasound (US) is the procedure of choice for assessment of scrotal trauma. Abd and other authors reported that scrotal ultrasound can not only diagnose testicular rupture, but also locate testicular hematoma, dislocation and hematocele with a sensitivity and specificity above 75% of the cases [1,2,15]. In addition, it can assess scrotal integrity, vascular flow, and the presence of foreign bodies [16]. In this patient ultrasonography revealed an avascular heterogeneous extratesticular mass with hyperemia of an intact ipsilateral testis after the inciting trauma. The absence of vascularity within the mass on doppler analysis is a valuable diagnostic criterion [2]. There are a few reports of iatrogenic scrotal hematoma secondary to inguinal herniorrhaphy or orchiectomy, but we could not find any previous case report of hematoma caused by compression injury against the operating table or inner thigh [1,2,17].

The treatment options for extratesticular hematoma are either conservative or surgical. The European Association of Urology recommends conservative treatment for hematoceles smaller than three times the size of the contralateral testis [18]. For confined extratesticular hematoceles without associated testicular injury, the appropriate therapy is observation, rest, analgesics, cold packs and series of clinical and ultrasound evaluations. Larger hematomas - regardless of coex-

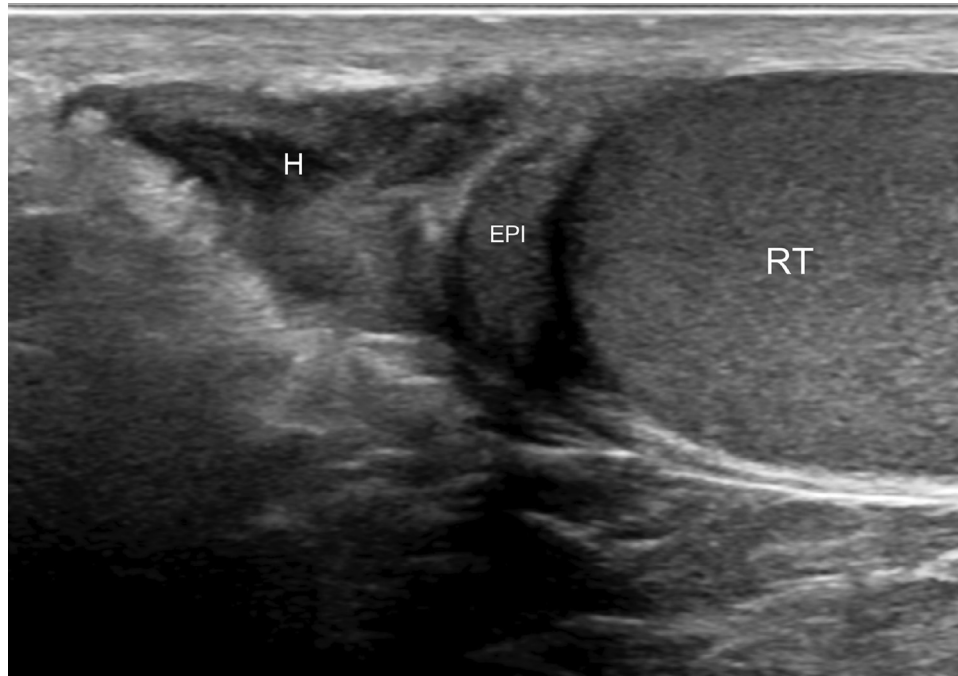


Fig. 3 – Longitudinal gray-scale US image obtained on postoperative day 3 shows a decrease in the size and echogenicity of the hematoma (H) from aging of the blood products and uniform echotexture of the right testis (RT) and right epididymis (EPI)

isting testicular injury - warrant operative intervention with evacuation of the hematoma to prevent potential complications including prolonged hospitalization and even orchiectomy [3,4,18,19].

This case highlights the important role of ultrasound in the evaluation of positional intraoperative scrotal trauma with prompt diagnosis potentially sparing the patient additional surgery. It also reinforces the need to be vigilant when placing the patient in the prone position for surgery.

Conclusion

Despite the rarity of the condition, it is utmost importance to recognize that iatrogenic extratesticular hematomas are a potential complication of prone intraoperative positioning. It is important for health care providers to adequately verify the intraoperative patient positioning in order to avoid positioning-related complications, as extratesticular hematoma can result in unnecessary hospital admission or longer length of stay, patient workup, and perhaps even unnecessary surgery. Ultrasound is the modality of choice for imaging scrotal trauma, including in the perioperative period.

Patient Consent

The authors declare that they have obtained a written consent of the patient to publish the Material in a journal/article.

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