Radiology Case Reports 16 (2021) 769–771

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journal homepage: www.elsevier.com/locate/radcr

Case Report

# Ultrasound of a patient with penetrating scrotal trauma: finding a needle in a haystack ☆,☆☆

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ARTICLE INFO

*Article history:*
Received 26 November 2020
Revised 6 January 2021
Accepted 11 January 2021

*Keywords:*
Ultrasound
Scrotal trauma
Pneumatic nail gun
Injury

ABSTRACT

We present a case of a 27-year-old man who referred to the Emergency Department complaining scrotal pain. He mentioned a sharp penetrating scrotal trauma occurred at work. Clinical examination showed mild scrotal tenderness. The patient underwent scrotal ultrasound that showed only a suspicious foreign body in the tunica vaginalis. A scrotal surgical exploration was performed and a nail was confirmed at the level of the tunica vaginalis.



## Introduction

Isolated urological trauma can be divided into blunt or sharp penetrating injuries, bites, burns, and scrotal avulsion [1]. What happens when the patient reports a penetrating trauma to the scrotum but we are unable to detect any clinical signs of entering in the scrotum?

Among construction workers, pneumatic nail guns are one of the most frequent tools causing hand, finger and lower extremity trauma [2]. To date, very few reports have described scrotal trauma due to such a tool. Ultrasound (US) scan is the first-line imaging of scrotal trauma and its findings can ease a prompt diagnosis and be helpful in clinical management. Here we present a case of uncommon scrotal penetrating trauma in which US has played a decisive role in the decision-making process.

## Case description

A 27-year-old man worker in a packaging center referred to the Emergency Department (ED) complaining that he accidentally injured his scrotum with a nail gun. His past medical history was uneventful. On clinical examination, there were no signs

☆ Financial disclosures: None.

☆☆ Conflicts of interest: All the authors have no conflict of interest with any institution or product that could have affected their manuscript.

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https://doi.org/10.1016/j.radcr.2021.01.022

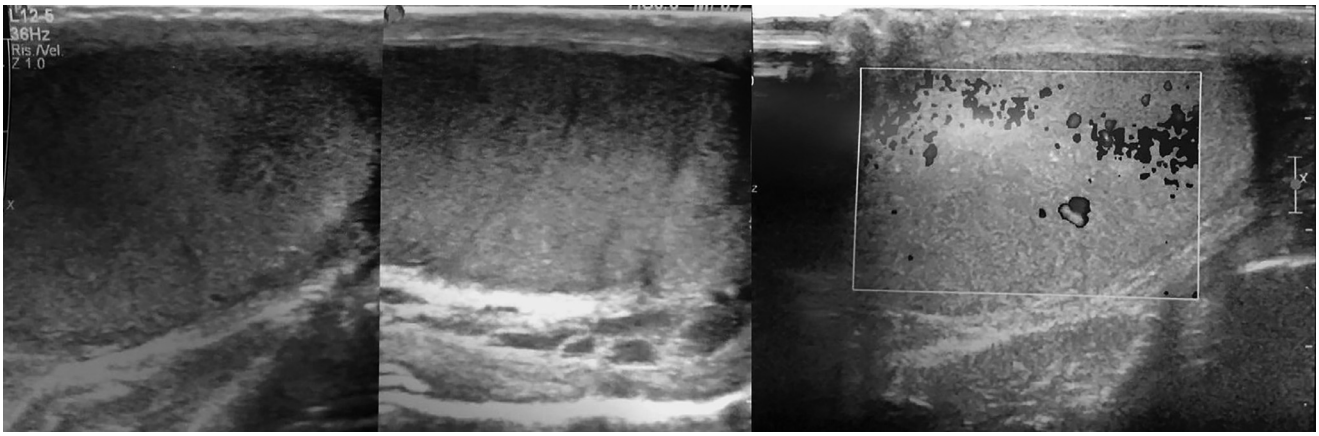

**Fig. 1 – Testicular integrity at ultrasound (US) scan. Tunica albuginea covering the right testicle is not interrupted. Color Doppler US shows normal testicular vascularity.**

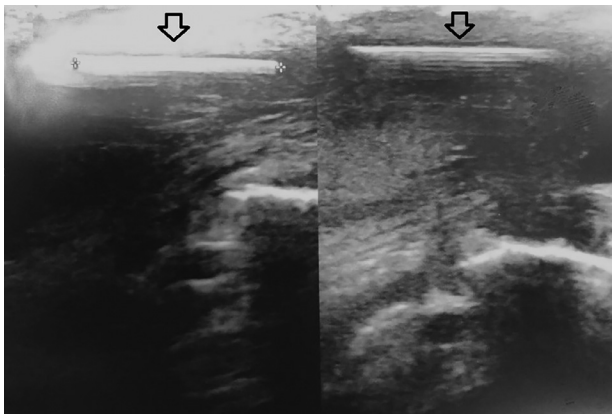

**Fig. 2 – Sonographic findings of an hyperechoic line without posterior shadow (*black arrow*) in the longitudinal scan of the right testis, measuring 1.82 cm in length, at the external lateral side of the testis.**

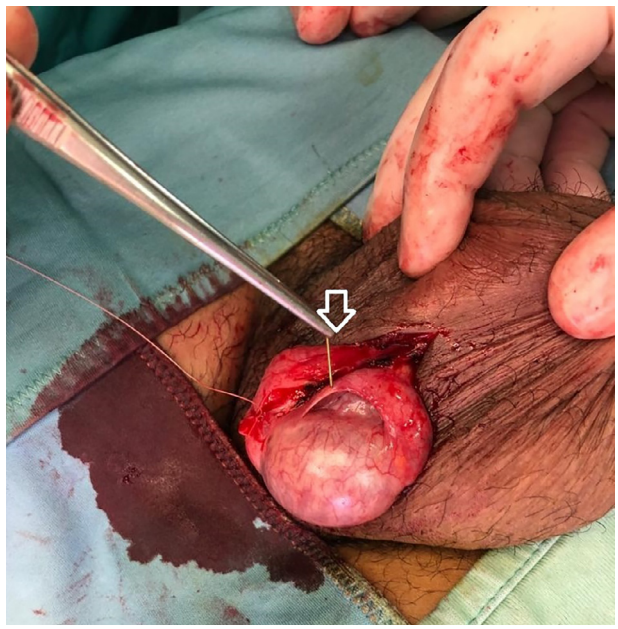

**Fig. 3 – Surgical exploration with intraoperative finding of a very thin nail of about 2 cm located below the tunica vaginalis, on the lateral right side of the testicle (*white arrow*).**

of penetrating trauma to the scrotum: the scrotum was tender at palpation, but the scrotal skin was intact. The patient underwent a point-of-care ultrasonography (POCUS) that was unremarkable and he was referred to our Urology Unit for a clinical evaluation suggesting to perform an X-ray if necessary. We repeated US scan [3]. The primary purpose of a scrotal ultrasonography after trauma is to look for hematoma and to check the integrity of the testis [4]. Ultrasonography showed no hematoma neither sign of albuginea rupture (Fig. 1). However a small hypoechoic area with a 18 mm hyperechoic line without shadow was located at the inferior pole of the right testis, suspicious for a foreign body (Fig. 2).

The patient underwent immediate surgical exploration because of high suspicion of a foreign body. After a midline incision, the exteriorization of the testis and the section of the tunica vaginalis, a thin nail of about 2 cm was retrieved between the tunica vaginalis and the tunica albuginea (Fig. 3). The right testis and epididymis were intact. The patient was discharged on the first postoperative day.

## Discussion

Since the 1980s, ultrasonography has been described as the first-line imaging modality for the evaluation of scrotal trauma, in order to identify injuries that require surgical exploration to preserve testicular function [5]. POCUS is routinely used in the ED as a "first and fast" sonographic approach to help in bedside diagnosis [6]. Seguin et al described its application in a series of pediatric patients for the detection of foreign bodies in different organs, including the scrotum [7]. Before urological examination, our patient underwent POCUS

in the ED that was not sufficient to make diagnosis. Although current evidence supports the role of POCUS in the detection of foreign bodies, this imaging modality still remains not entirely reliable to formulate a certain diagnosis in all situations.

Reports have described nail gun injuries to the thorax, heart, abdominal wall, flank, pelvic wall, facial bones, and skull. Paralytic spinal cord transection, bowel perforation, long bone fracture, liver laceration, hemopneumothorax, blindness, cerebral damage, and even fatal injuries have been reported [8-10].

Nevertheless, the literature describing injuries of the scrotum with a nail gun is scarce.

Migliorini et al recently reported a similar case of nail gun injury of the testis [11]. In their report, the patient presented with a puncture wound in the scrotum and underwent a scrotal X-ray to detect the foreign body. Conversely, in our case no sign of penetrative trauma was present on the scrotal skin. Pneumatic nail guns have a safety device at the end of the mouth of the gun which must be pressed to activate the discharge system [12]. Probably, an incorrect activation or an awkward movement during the shot determinated self-injury in our case.

The absence of signs of penetrating trauma in our case might be explained by self-examination that could have pushed the nail inside the scrotal wall.

The fact remains that clinical examination was initially misleading and confusing. The role of X-ray in a clinical suspicion of metallic foreign bodies is well known and it also finds application for penetrating genitourinary trauma [13,14].

Given that a metallic nail has a radiopaque appearance, performing an X-ray could be a valid choice for further diagnostic investigations when the suspicion of metallic retained object in the scrotum is high. In our case, sonographic findings clarified any doubts about the presence of a foreign body in the scrotum and then we did not consider it necessary to perform further radiological examinations.

Our case also highlighted the value and role of scrotal ultrasonography in case of closed scrotal trauma. US scan performed by well-trained operators may be sufficient to provide surgical indications, avoiding the execution of further diagnostic tests and reducing radiation exposure.

In conclusion, our case confirms that US is always an essential tool that should be in the “pocket” of all urologists.

Moreover, we suggest that a scrotal US should always be performed by urologists in case of sharp trauma even if the clinical examination is unremarkable.

## Authors’ contributions

All authors participated in the design and conduct of the study. All authors reviewed and approved the final version of the manuscript.

## Patient consent

Written informed consent was obtained from the patient for the publication of his case.

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