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Sonographic Evaluation of Funiculitis Associated with Acute Scrotal Pain

Case Report

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Abstract

A 24-year-old male presented to the emergency department with acute scrotal pain focused around the inguinal area and right testicle. Sonographic evaluation of the right testicle and inguinal area showed epididymo-orchitis and thickening of the spermatic cord with hyperfused echogenic fat suggestive of funiculitis. There was no dilation or inflammation of vasa deferens thus ruling out vasitis or protrusion of abdominal content or bulge which is indicative of hernia

Introduction

Testicular pain is common amongst patients that show up in the Emergency Department (ED). Pain can be acute, a sudden rise in pain that usually last for a short period or chronic. It can stem from a variety of causes ranging from a direct trauma to the testicle causing sudden rise in pain, infections such as epididymitis or orchitis, or hematocele (pooling of blood in the scrotum) [1]. In case of a severe pain resulting from torsion which is a medical emergency and needs immediate attention. Other potential causes include renal stones, hernias or pain resulting from back or abdomen.

Funiculitis, an inflammation of the spermatic cord, can cause pain and swelling in the scrotum and groin area. However, it is not a frequent finding associated with acute scrotal pain. It's often characterized by pain radiating from the inguinal canal to the scrotum. Funiculitis is associated with increased echogenicity of the spermatic cord fat with mass-like cord thickening [2]. The symptoms can be mistaken for other conditions like epididymitis, orchitis or testicular torsion and inguinal hernia, thus proper diagnosis is crucial.

Case report

A healthy appearing 24-year-old male who presented to the emergency department (ED) with scrotal pain radiating on to the right groin and testicle area. He stated that about 6 days ago he experienced a sudden onset of right testicular pain. The right testicle he says has been larger than left for a long time. He denies sexual activity. Denies new sex partner. On examination his right testicle was found to be swollen and had an elevated WBC count. A CT scan showed. scrotal edema, prominent right inguinal vascular structures and small right hydrocele. For further evaluation testicular ultrasound was recommended.

Sonographic grey scale images, and color Doppler spectrum were obtained on a Philips EPIQ 5G ultrasound machine using a high frequency L18.4 linear transducer.

Ultrasound image of the right testicle is shown in (Figure 1a). The epididymis in this image appears prominent. Right testicle and epididymis are hyperemic on color Doppler with thickened wall, as shown in (Figure 1b). This is indicative of orchitis and epididymitis.

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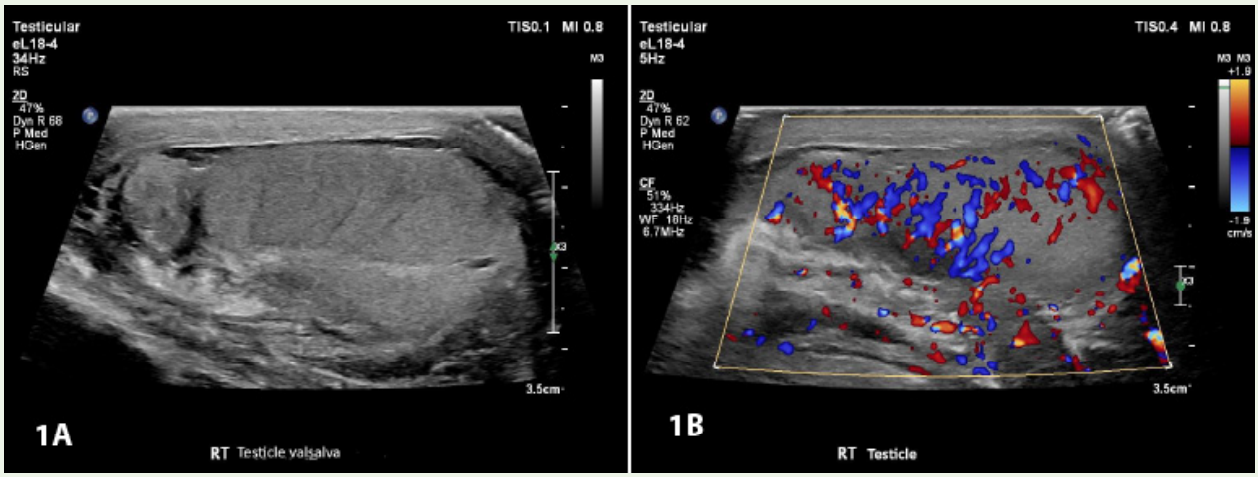

Figure 1: Epididymo-orchitis in a 24-year-old man with groin pain. (A, B) Sagittal gray-scale (A) and color Doppler (B) US images show a markedly inflamed thickened scrotal wall and substantial hyperemia is evident on color Doppler US image (in B) indicative of orchitis.

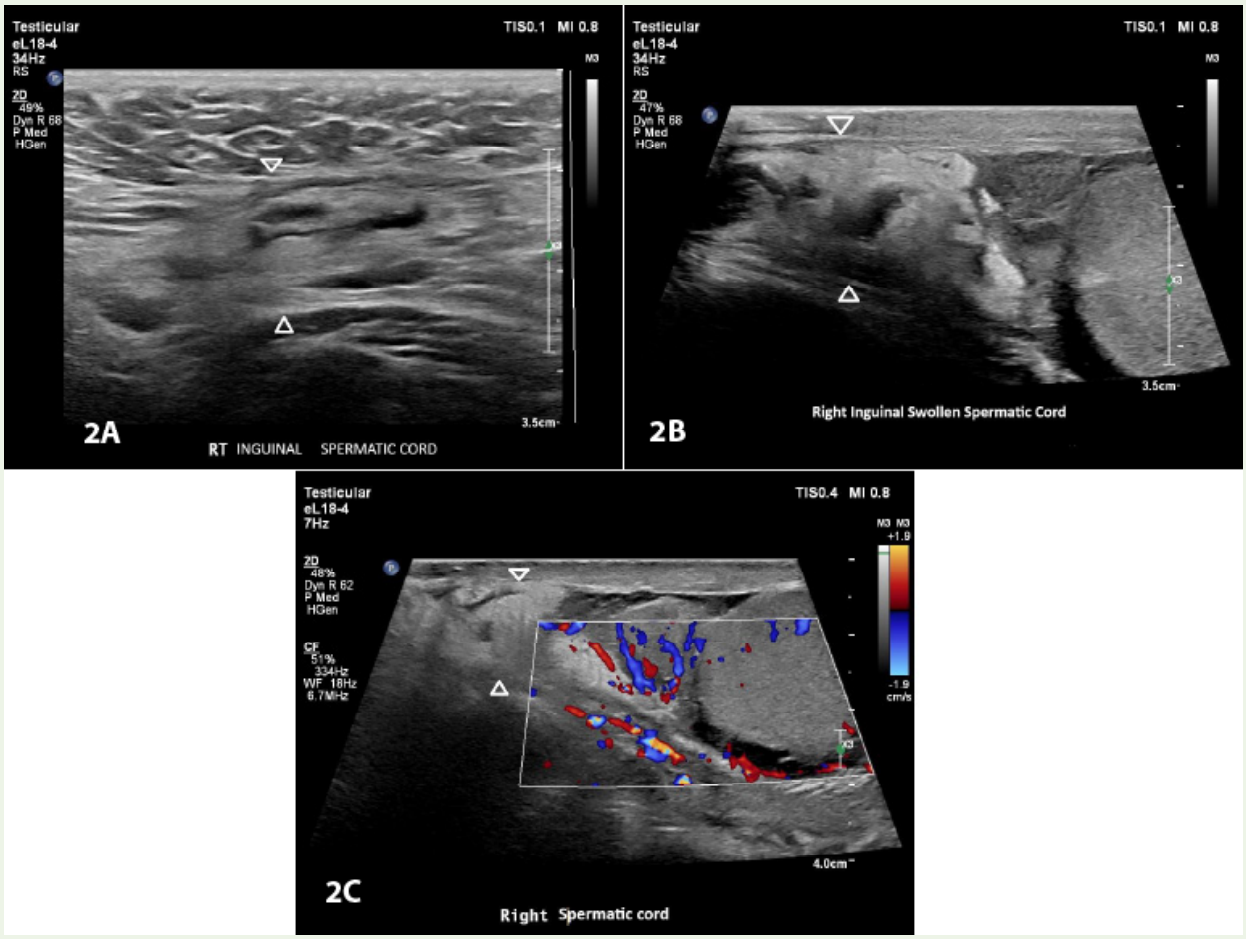

Figure 2: Sonographic images of the right spermatic cord shown within arrowheads. (A) Gray scale image of the right spermatic cord in the inguinal canal. Spermatic cord is thickened within arrowheads and hyperperfused with echogenic fat. (B) Gray scale image of the right spermatic cord entering the scrotum. (C) Color Doppler image of a small section of the spermatic cord and right testicle.

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Patient complained of inguinal pain and swollen right scrotum. The US images of spermatic cord (SC) within the left inguinal canal is shown in (Figure 2 a–c). The spermatic cord shown in (Figure 2 a-c) is markedly inflamed and distended SC (within arrowhead) with hyperechoic fat, which is indicative of funiculitis and edema. The right epididymis is vascular. To rule out inguinal hernia patient was asked to perform Valsalva and images were taken. No peristalsis of bowel into the inguinal canal or scrotum was visualized, (Figure 1). There was no protrusion of abdominal content or bulge in the inguinal area suggestive of hernia [3]. Thus, hernia was ruled out. In the case of funiculitis there is no mass or bulge but thickened cord.

Discussion

Funiculitis is a relatively rare condition characterized by inflammation of the spermatic cord, which provides blood supply to the testicles. It can occur alone or alongside inflammation in other nearby structures like the epididymis (epididymitis) or testicles (orchitis). A severe form of funiculitis and epididymitis that results in a testicular infarct may have identical US findings [4].

The SC is a cordlike structure suspending the testis and epididymis. It passes through the inguinal canal (IC), and exits at the superficial inguinal ring into the scrotum. In the scrotum, it terminates at the posteromedial border of the testis. The SC contains the ductus (vas) deferens, a 45-cm–long tube that transports mature sperm from the epididymis to the ejaculatory duct [2].

Normal appearance of SC is characterized by echogenic tubular structure in the inguinal canal and within one can see vasa deferens mucosal lining 1.5 mm in thickness appearing hypoechoic within two echogenic parallel lines in a tubular structure [2]. This structure was seen in our images. Inflamed dilated tubular structure of vasa deferens with mild hyperemia is a diagnosis for vasitis [2].

Color Doppler ultrasound is the initial primary diagnostic tool in the evaluation of acute scrotal pain. It is effective in differentiating funiculitis and epididymitis from torsion which is a surgical emergency. Computed tomography (CT) while not the primary choice due to radiation exposure but can be useful in specific situations, such as acute abdominal pain where appendix or renal stones are considered, or if a spermatic cord abscess is suspected. Magnetic resonance imaging (MRI) can be used when ultrasound findings are inconclusive. MRI offers superior soft tissue contrast resolution, which can exclude complex pathologies such as tumors, vasculitis and even rare condition like granulomatous funiculitis [5].

Recently it was shown that the sonography is a sensitive marker for the presence of funiculitis in the setting of acute scrotal pain [6].

New sonographers when evaluating acute scrotal pain usually focus on scrotum findings and may likely miss imaging the spermatic cord. Funiculitis is a rare condition and may be overlooked or misdiagnosed. Thus, from teaching perspective it is important to image spermatic cord / dilation of vasa deferens and look for abnormalities that can be correlated to acute scrotal pain.

Future study will include more cases covering acute scrotal pain associated with different pathologies including granulomatous funiculitis.

Conclusion

Sonographic evaluation of a 24-year-old male with acute scrotal pain showed thickening of spermatic cord with hyperfused fat suggestive of funiculitis. There was no dilation of vasa deferens suggestive of vasitis or protrusion of abdominal content or bulge which is indicative of hernia. Right testicle and epididymis were hyperemic thus, suggestive of epididymo-orchitis.

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