CASE REPORT

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Testicular torsion – USG and Color Doppler correlation: A case report

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ABSTRACT

Testicular torsion if not promptly recognised and managed, can lead to testicular loss. Predominantly occurring in young boys, if not detected at an earlier stage could lead to severe debility and handicap them in their adult life. Color Doppler US is essential to confirm or exclude testicular torsion, which is recognized by an absence of detectable blood flow in the testis. Here we present a case of a 13 year old boy who presented with acute left sided scrotal swelling and pain since 12 hrs.

Keywords- sonography, testis, torsion, emergency, Doppler

1. INTRODUCTION

Acute scrotum is an emergency. Testicular torsion being a surgical emergency represents approximately 25% of the causes. The annual incidence of testicular torsion is approximately 1 in 4000 persons under the age of 25 years, with highest prevalence between 12 and 18 years old. It usually occurs without any apparent cause, but it has been associated with anatomical, traumatic, and environmental factors, among others (Fernández et al., 2017). Testicular torsion occurs when the testis is rotated causing twisting of the spermatic cord resulting in ischaemia and eventual necrosis. Testicular torsion contributes to male infertility accounting for 5.8% of causes of testicular insufficiency (Oseni, 2018).

In many cases, clinical evaluation is limited by the non- specificity of the history and laboratory results and the difficulty in palpating an extremely tender testis. In these patients, Color Doppler Ultrasound is very effective in helping to confirm or exclude the diagnosis of torsion (Horstman et al., 1991).

2. CASE HISTORY

A 13 years old male came with complaint of acute left sided scrotal pain and swelling since 12 hrs. The swelling and pain were sudden in onset. The patient was afebrile. There was no history of trauma or any bowel and bladder complaints. On local examination there was left scrotal swelling with tenderness and the testis was horizontal in position. Right sided testis was in normal position. Ultrasonography showed enlarged and hypoechoic left testis with reactionary fluid around it (figure 1). Color Doppler, and power Doppler showed no flow in the left testis (figure 2 and 3). There was e/o hyperechoic twisted epididymis showing the Classical torsion knot or whirlpool appearance (figure 4).

Intraoperatively the left testis was confirmed to be ischemic and malrotated (figure 5). Left sided orchidectomy and right sided orchidopexy was performed. The patient showed improvement in his condition after surgery.

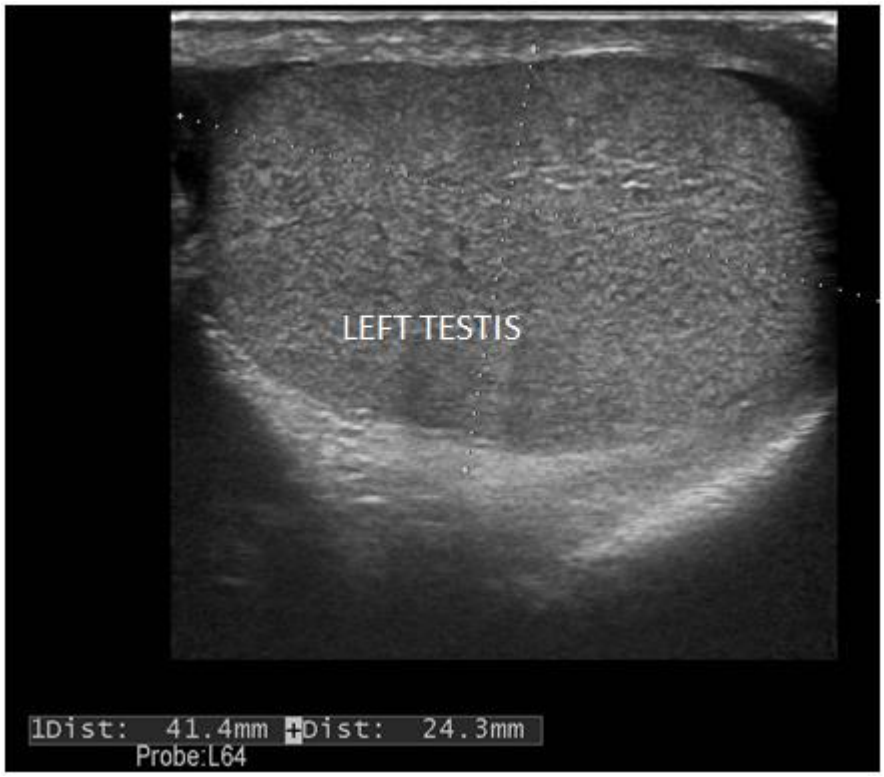
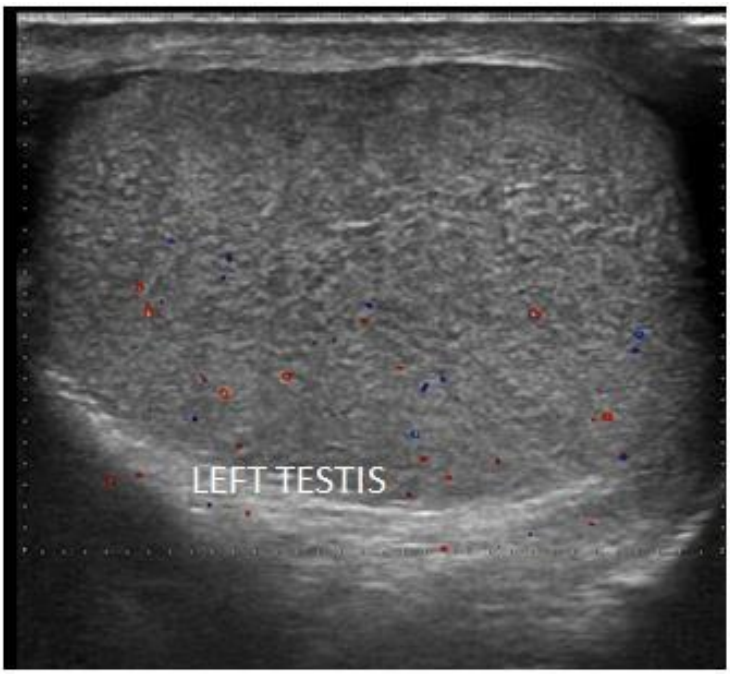


Figure 1 Enlarged hypoechoic left testis (4.1 cm × 2.4 cm) resulting from torsion with reactionary fluid around it.

3. DISCUSSION

Torsion most commonly occurs in the absence of any precipitating event. Only 4% to 8% of cases are a result of trauma. The causes of testicular volume increase are many and can vary from as simple as an increase in volume during puberty (a common occurrence) or horizontally lying testicles to testicular tumors. Other predisposing factors could be patients with a history of cryptorchidism or a long intrascrotal part of the spermatic cord, amongst others (Ringdahl & Teague, 2006).

In testicular torsion, twisting of the spermatic cord will first occlude venous flow and then later impede arterial circulation. The extent of testicular ischemia will depend on the degree of twisting (180°–720°) and the duration of torsion. The chances of salvaging the testes after torsion are higher within 4 – 6 hours of onset. On the basis of the surgical findings, two types of testicular torsion are found: extravaginal and intravaginal. Extravaginal torsion is usually seen in newborns and in most cases occurs prenatally. At birth the testis is usually necrotic and presents with an enlarged and discoloured scrotum on the affected side. Ultrasound findings may differ but complex hydrocele and calcification of the tunica albuginea are common. Intravaginal torsion can occur at any age but is more common in adolescents and predominantly seen in "bell clapper" deformity, in which the testis rotate freely as the tunica vaginalis meet the spermatic cord at a higher level than usual (Aso et al., 2005).



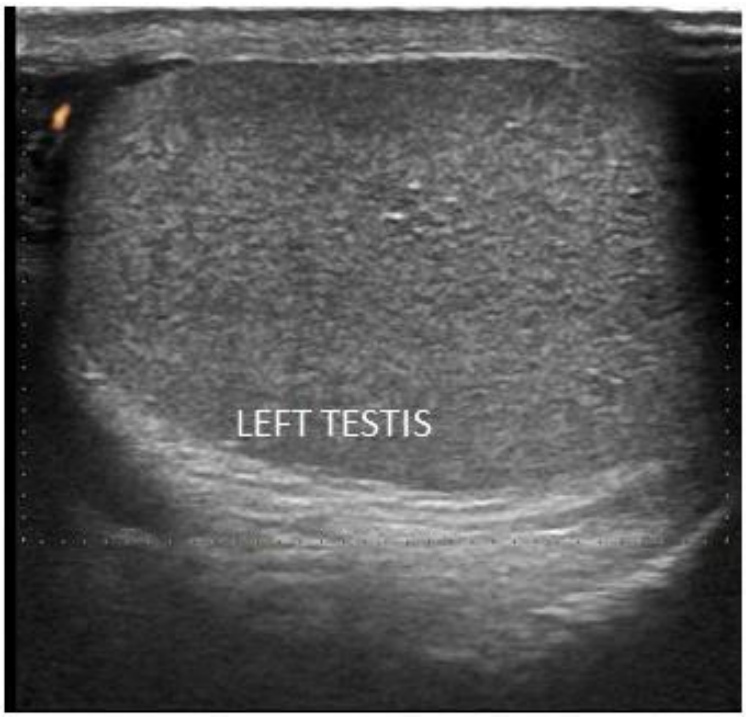


Figure 2 and 3 Longitudinal color Doppler and power Doppler scans shows absent flow in the left testis.

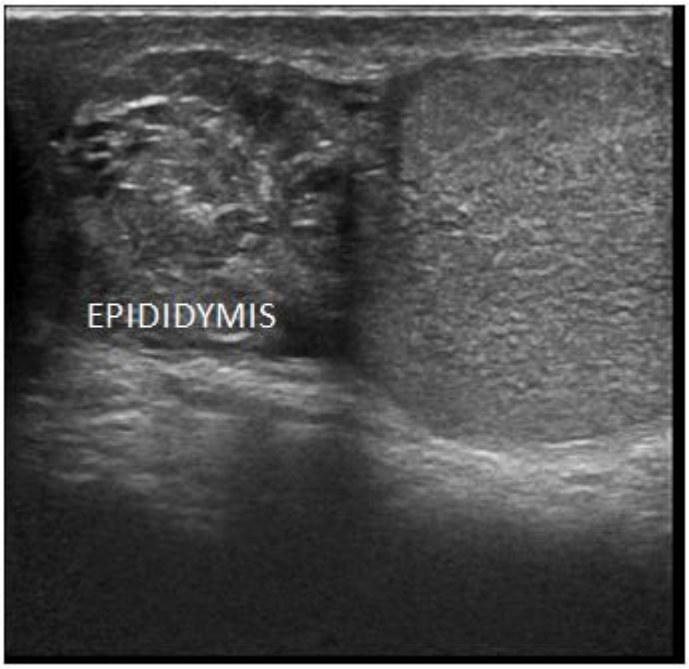


Figure 4 Sonography image showing Hyperechoic twisted left epididymis with the characteristic torsion knot or whirlpool pattern

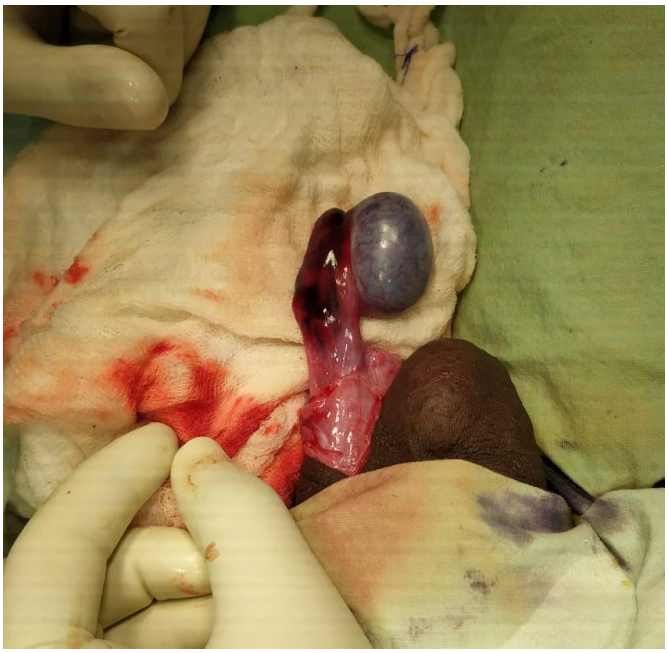


Figure 5 Intraoperative image showing ischemic left testis.

Testicular torsion should be diagnosed quickly and accurately. Any delay in diagnosis (and subsequent delay in surgery) can risk the viability of testis, whereas over diagnosis can lead to unnecessary surgery. The rate of salvage is maximum, at around 90 percent within 6 hours of onset of symptom and gradually dips to 50 percent after 12 hours and is less than 10 percent beyond 24 hours (Ringdahl & Teague, 2006). Ultrasound is best performed with a linear high-frequency (7.5–12.0 MHz) transducer with the penis placed in an anatomic position over the abdomen (Avery & Scheinfeld, 2013). At 1 – 3 hours in the early acute phase the testis shows normal echogenicity. As it progresses, the testis gains volume with either an increase or a more heterogenous echogenicity. With progression, enlargement of the affected testis and increased or heterogeneous echogenicity are common seen. The point of cord twisting can be identified at the external inguinal orifice hence sonographic evaluation of the spermatic cord is an important part of the examination. The intrascrotal portion of the edematous spermatic cord appears as an oval or curly echogenic extratesticular mass, with the head of the epididymis wrapped around it. There may be alteration in the orientation of the testis, epididymis, and cord. A reactive hydrocele and scrotal thickening are often associated with torsion.

Torsion can sometimes change the position of the long axis of the testis. Extratesticular sonographic findings typically occur in torsion and are important to recognise. The characteristic "whirlpool pattern' or "torsion knot" is caused due to the twisting of the spermatic cord lying just above the testis and epididymis (Rumack & Levine, 2018). Differentiating testicular torsion from epididymo-orchitis is a great challenge, as clinical symptoms such as scrotal pain, swelling and tenderness are common to both the entities. The primary difference is that pain in testicular torsion has a sudden onset, whereas in orchitis it is more gradual. However, about 5% of children with orchitis have sudden onset of pain, and only 50% of patients with testicular torsion have an acute attack (Aso et al., 2005). A definitive diagnosis of complete testicular torsion is made when blood flow is nil on the affected side but is perfectly maintained on the normal side. In a testis if the cord twists less than 360°, the arterial flow is not fully obstructed and is then referred to as a case of incomplete torsion (Aso et al., 2005).

Meticulous scanning of the testicular parenchyma with the use of low flow detection Doppler settings(low pulse repetition frequency, low wall filter, high doppler gain , small color sampling box)is important because intratesticular vessels are small and have low flow velocities in prepubertal boys (Rumack & Levine, 2018). Additional information can be obtained from pulsed-wave Doppler imaging with which decreased or reversed diastolic flow may be evident on the affected side, and from scintigraphy and MR imaging.

In testicular torsion, color Doppler has a sensitivity ranging from 80 % to 98%, specificity of 97% to 100 % and accuracy of 97 %. The use of intravascular contrast agents in sonography can improve the sensitivity and specificity of detecting blow flow in scrotum (Rumack & Levine, 2018). Gray-scale Sonography and color Doppler findings can help in detecting the viability of testis. Normal echogenicity of the testis with mild enlargement is a good sign of viability, whereas marked enlargement with heterogeneous echotexture and scrotal wall hypervascularity are signs of testicular infarction and necrosis (Aso et al., 2005).

4. CONCLUSION

Color Doppler is the most commonly used imaging modality to differentiate between nonsurgical and surgical cases of pediatric population with acute scrotal pain. USG and color Doppler are highly sensitive and specific for early diagnosis of testicular torsion. A complete testicular torsion can be diagnosed when color Doppler shows absence of flow on the affected side and maintained flow in the normal testis. The epididymis appearing hyperechoic and enlarged is a helpful sign in diagnosing prepubertal testicular torsion or a case of testicular torsion showing deceased flow on color Doppler which in turn can help preventing testicular loss.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of Interest: The authors declare no conflict of interest.

REFERENCE

1. Aso C, Enríquez G, Fité M, Torán N, Piró C, Piqueras J, Lucaya J. Gray-scale and color Doppler sonography of scrotal disorders in children: an update. Radiographics. 2005 Sep;25(5):1197-214.
2. Avery LL, Scheinfeld MH. Imaging of penile and scrotal emergencies. Radiographics. 2013 May 3;33(3):721-40.
3. Carol M. Rumack, Deborah Levine. Diagnostic ultrasound. Fifth edition. Philadelphia .PA: Elsevier. 2018 ; chapter 22 : the scrotum : 844-46
4. García-Fernández G, Bravo-Hernández A, Bautista-Cruz R. Testicular torsion: A case report. Cirugía y Cirujanos (English Edition). 2017 Sep 1;85(5):432-5.
5. Horstman WG, Middleton WD, Melson GL, Siegel BA. Color Doppler US of the scrotum. Radiographics. 1991 Nov;11(6):941-57.
6. Oseni TI. Testicular Torsion in a 17 Year Old Boy: Role of School Health Education. J Contracept Stud. 2018;3:12.
7. Ringdahl E, Teague L. Testicular torsion. American family physician. 2006 Nov 15;74(10).