

An intratesticular arteriovenous malformation identified incidentally during ultrasound evaluation of scrotal trauma

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Abstract

Intratesticular arteriovenous malformation (AVM) is an extremely rare benign testicular lesion. Ultrasonography (US) usually reveals a hypoechoic solid vascular mass within the testicular parenchyma. Herein, we report our experience with a young patient in whom an intratesticular AVM was found incidentally by US during the workup of scrotal trauma.

Key Words: Intratesticular arteriovenous malformation, testis, ultrasound

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INTRODUCTION

Testicular cancer is the most common cancer in men aged 20–34 years and accounts for 1% of all malignancies in men. Gray-scale ultrasonography (US) is the imaging modality of choice to detect testicular carcinoma with a sensitivity of nearly 100%. Color Doppler and power Doppler US demonstrate increased vascularity in the majority of malignant tumors and help to better define testicular involvement.^[1,2] Most intratesticular masses are malignant.^[3] Besides primary testicular lesions, a number of cystic benign lesions such as testicular cysts, tubular ectasia of the rete testis, intratesticular varicocele, and solid-appearing benign lesions such as hemangiomas and arteriovenous malformations (AVMs) can be observed.^[4] Intratesticular AVM is a rare mass lesion of the testis with usually <10 mm size. There are few reports of intratesticular AVM in literature.^[5] Herein, we report a case of intratesticular AVM diagnosed

incidentally by US during workup of testicular trauma.

CASE REPORT

A 15-year-old boy presented to our radiology department for ultrasound of scrotum due to recent testicular trauma. The patient was otherwise healthy with no remarkable past medical history. He mentioned recurrent scrotal trauma during martial sports which were not more evaluated. Physical examination revealed normal-sized, intrascrotal testicles with no evidence of palpable lesion or varicocele. Gray-scale ultrasound images demonstrated a well-defined, 6.5-mm-diameter hypoechoic round lesion in the right testicle. Color Doppler ultrasound showed several enlarged tortuous small vessels including arteries and veins in the lesion [Figure 1]. Measurements revealed peak systolic velocities ranging 8–12 cm/s,

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end diastolic velocities of 5–8 cm/s, and resistive indices of 0.23–0.41. A mean flow velocity of 3 cm/s in the venous part of the lesion was detected. No reversal of the venous flow was detected during valsalva maneuver. A draining vein was also demonstrated [Figures 2 and 3]. Other ultrasound findings were unremarkable. Intratesticular AVM, intratesticular varicocele, and intratesticular hemangioma were considered as differential diagnoses.

Considering the imaging findings, an intratesticular AVM was diagnosed in our patient. No intervention was performed considering the small size of the lesion and the patient's age. The patient was discharged with recommendation for regular control ultrasound examinations. In follow-up ultrasound after 1 year, no obvious change was detected.

DISCUSSION

High-frequency US is the modality of choice to detect scrotal pathologies. The use of grayscale and color Doppler high-frequency US allows radiologist to better characterization of benign scrotal lesions and differentiation of these lesions from malignant ones.^[1,4]

Pathological processes of the testis are very frequently encountered and include nontumoral and tumoral lesions. Testicular tumors are the most common tumors of men of 20–40 years old age. The vast majority of testicular tumors have germ cell origin. Vascular benign lesions are very rare and include intratesticular AVM, intratesticular hemangioma, and intratesticular varicocele.^[4]

Intratesticular varicocele is a rare and relatively new entity, reported in fewer than 2% of symptomatic patients undergoing testicular ultrasound in comparison with extratesticular varicocele, which has a prevalence of 15–20%. Patients with intratesticular varicocele may present with testicular pain secondary to venous congestion which causes stretching of the tunica albuginea.^[6] Intratesticular varicoceles are usually associated with extratesticular varicoceles. The typical location of the lesion is subcapsular or adjacent to mediastinum of testis. The ultrasound characteristics of intratesticular varicocele are similar to extratesticular varicocele. Gray-scale ultrasound shows tubular or twisting structures of more than 2 mm in diameter with a positive valsalva maneuver, which confirms the venous origin of the lesion. Color Doppler ultrasound also determines the vascular origin of intratesticular varicocele. Valsalva maneuver is helpful to characterize some of the vessels which may not show spontaneous flow. Intratesticular

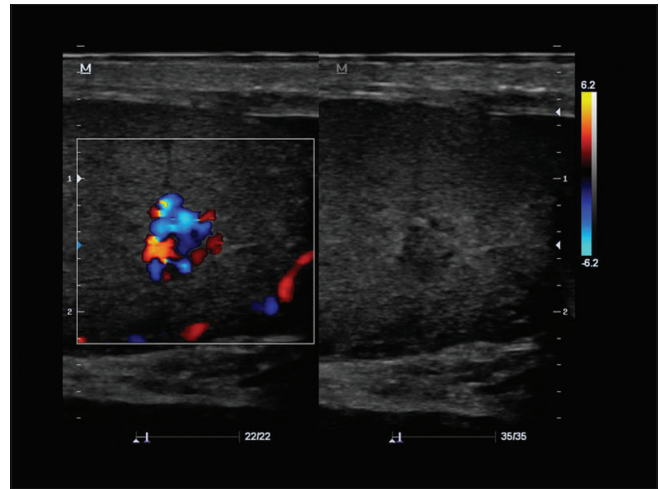


Figure 1: Ultrasound revealed a hypoechoic mass and color Doppler showed the vascular nature of the lesion

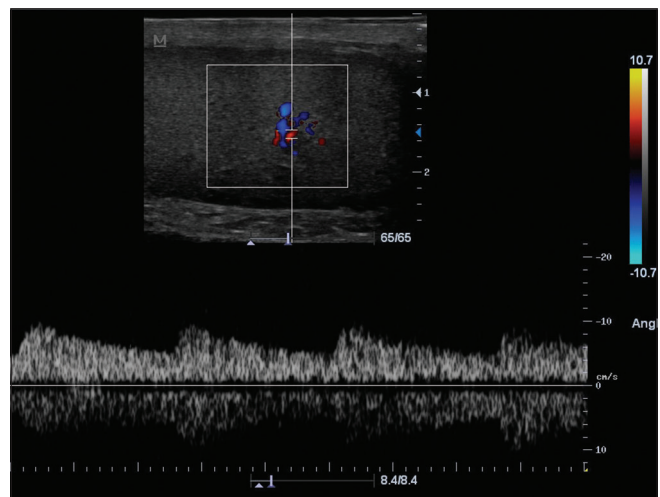


Figure 2: Color Doppler ultrasound demonstrates venous flow in draining vein of the lesion

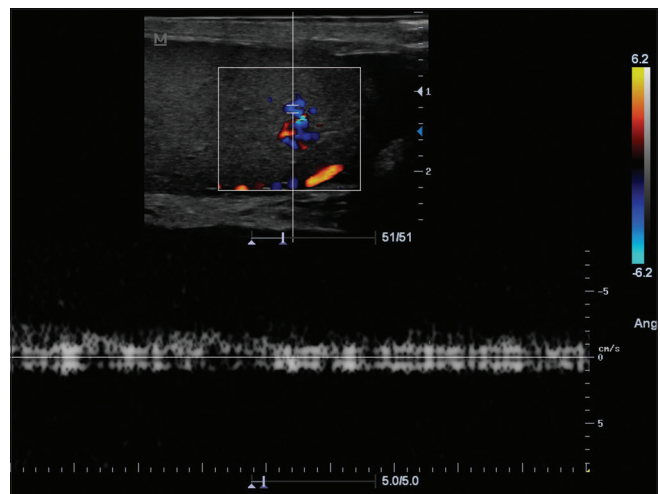


Figure 3: Color Doppler ultrasound demonstrates arterial flow in arterial part of the lesion

varicoceles adjacent to the mediastinum of testis may be misdiagnosed as tubular ectasia; however, color Doppler ultrasound helps to differentiate between the two entities.^[7]

Hemangiomas are usually characterized by testicular enlargement with or without tenderness. Gray-scale ultrasound usually shows a focal, well-circumscribed hypoechoic lesion with calcifications, and color Doppler ultrasound patterns may show variations among different types of hemangiomas including a low resistance pattern probably demonstrating arteriovenous shunting.^[8] Massive vascularity within the lesion with high peak systolic, end diastolic velocities, and a low resistance index can be seen in both AVM and hemangioma. Therefore, differentiation between intratesticular AVM and hemangioma on ultrasound is challenging.^[5]

Considering the ultrasound findings, as the presence of an almost entirely vascular mass with a feeding artery and a draining vein, that is characteristic for AVM,^[9] an intratesticular AVM was diagnosed in our patient. Because of the small size of the vascular mass, invasiveness, and risk of radiation, no angiographic imaging and endovascular interventional procedure were performed.

AVMs of male genitalia have been reported in the literature (penis, scrotum, spermatic cord, and epididimides). Intratesticular AVM is an extremely rare malformation. AVMs of the spermatic cord and testis are rare benign lesions containing tangles of dilated arteries and veins without intervening capillaries. They usually present as painless paratesticular mass or as incidental finding during evaluation of infertility. However, they can rarely present with recurrent acute scrotal pain. The pathogenesis of intratesticular AVM may be congenital or posttraumatic as seen in our patient.^[9]

Less information is available in the literature regarding the long-term care of intratesticular AVM because only a few cases have been reported in the

literature to date. All patients that were presented in these articles had been refused surgery and were followed up by ultrasound, and all of them remained asymptomatic without any change in features of the AVM.^[5,9,10] Like other patients, our patient remained asymptomatic, and his ultrasound studies showed no change during follow-up.

Our case represents typical ultrasound findings of intratesticular AVM and emphasizes that it is important to keep in mind this lesion as a valuable differential diagnosis in intratesticular benign vascular lesions.

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Conflicts of interest

There are no conflicts of interest.

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