CASE REPORT

Multi-modality Approach to an Adolescent Scrotal Arteriovenous Malformation

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ABSTRACT

Arteriovenous malformation (AVM) is a vascular abnormality that rarely affects the scrotum with only less than 20 reported cases in the literature. This is a retrospective review of an adolescent who complained of a slowly enlarging left scrotum initially thought to be due to a varicocele. Varicocelectomy was performed but the scrotal enlargement progressed. A testicular neoplasm was then considered. Imaging work-up using grey-scale ultrasound with color Doppler study and contrast-enhanced computed tomography scan however revealed a tangle of abnormal vessels reflective a scrotal AVM, confirmed and subsequently managed via conventional angiography with transcatheter embolization prior to eventual surgical excision. The use of various pre-operative imaging techniques for visualization, characterization and diagnosis of such anomalies are very critical to provide the appropriate management for these patients.

Keywords: adolescent, arteriovenous malformation, male genital disease

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INTRODUCTION

Vascular anomalies include varicocele, hemangioma, lymphatic malformation and arteriovenous malformation (AVM). Among these, arteriovenous malformations are the least common [1]. AVMs are generally considered to be congenital in nature, but it can be familial or sporadic. There are also reports of acquired AVMs diagnosed in older patients without being present at birth [2].

AVMs usually occur intracranially, and less commonly in the extracranial head and neck, extremities, truncal and visceral sites. Such vascular anomalies rarely involve the scrotum or its contents, presenting in a broad spectrum of symptoms mainly as paratesticular or intratesticular masses, which are detected during the evaluation of acute pain, swelling, infertility, and bleeding [3]. Scrotal AVMs are extremely rare, and there are only less than 20 cases of Scrotal AVM reported in the literature. These can cause oligo or azoospermia due to elevation in the scrotal temperature [4].

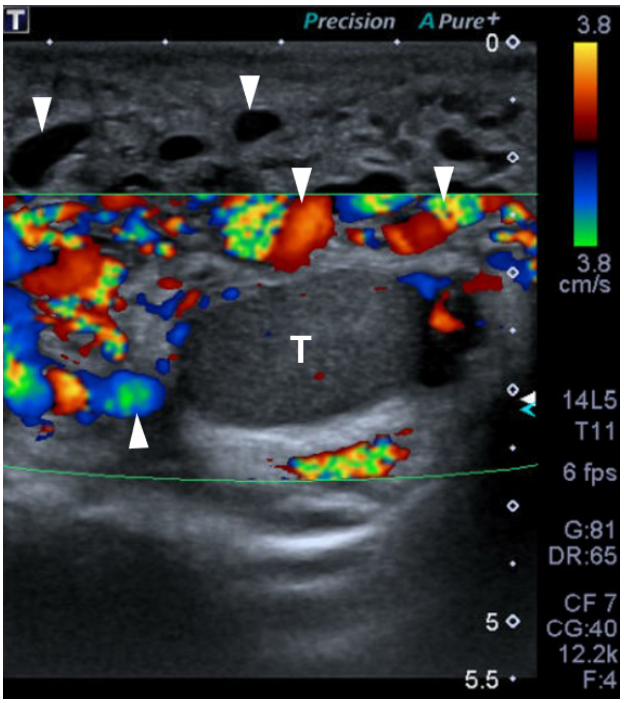
This paper presents a rare occurrence of a scrotal AVM in an adolescent, and the importance of multi-modality imaging techniques in the diagnosis and multi-disciplinary management of patients with such a condition. This was approved by the hospital's Institutional Ethics Review Board.

THE PATIENT

A 17-year-old Filipino male presented with a slowly enlarging left scrotum for five years. Initial diagnosis was a varicocele, for which he underwent varicocelectomy in 2017. However, the scrotal enlargement progressed prompting further evaluation two years after surgery.

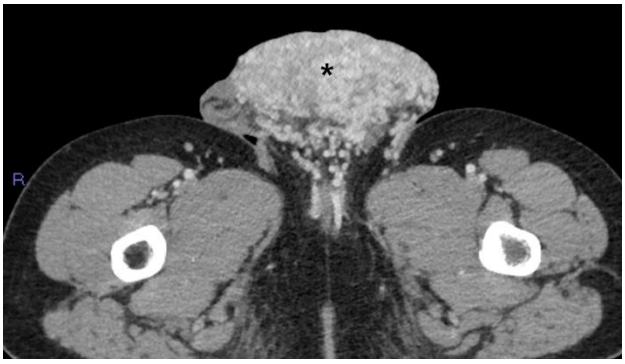
Grey-scale ultrasound with color Doppler study was performed which demonstrated significant dilatation of pulsating peritesticular vessels bilaterally even at rest measuring up to 0.55 cm in maximum diameter (Fig. 1). The testicles were also smaller than usual. A scrotal AVM was considered.

Fig. 1 Ultrasound with color Doppler study of the patient in sagittal view shows significant dilatation of the peritesticular vessels (*arrowheads*). These were observed to be pulsatile (*not shown*) which suggests an arteriovenous malformation rather than a varicocele. The testicle (T) is also small for age



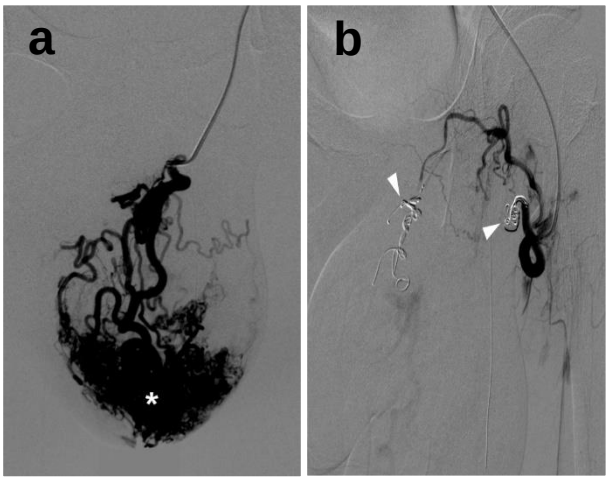
Contrast-enhanced lower abdominal computed tomography (CT) scan (Fig. 2) was also done which revealed a network of dilated serpiginous vascular structures in both scrotal sacs, left significantly more than right, with approximate aggregate measurement of 8.3 x 11.3 x 13.4 cm (anteroposterior x transverse x craniocaudal dimensions) in keeping with the sonographic consideration. The AVMs appeared to be supplied and drained by the internal and external iliac vessels.

Fig. 2 Axial contrast-enhanced lower abdominal CT image in soft tissue setting demonstrates the network of dilated serpiginous vascular structures in both scrotal sacs (*asterisk*), left significantly more than the right



Patient then underwent pre-operative conventional angiography (Fig. 3a) confirming the diagnosis with selective catheterization and embolization achieving significant devascularization (Fig. 3b). Ligation and excision of the AVM were performed with no complications.

Fig. 3a–b Conventional Angiography (**a**) with selective catheterization of the left internal iliac artery confirms the diagnosis of arteriovenous malformation (*asterisk*). Post-embolization (**b**) with alcohol and coils (*arrowheads*) resulted to significant devascularization of the lesion



CONCLUSION

Although ultrasound and cross-sectional imaging are important tools to diagnose AVMs, transcatheter angiography is needed to better delineate the feeding vessels and draining veins [1,4], as in this case.

Embolization and surgical resection are the recommended options in patients with scrotal AVMs. Embolization is performed prior to surgical resection to minimize bleeding during the operation. Spermatogenesis has been shown to improve following surgery [4]. Thus, medical imaging using the various modalities play a critical role in the evaluation of patients with scrotal enlargement for proper diagnosis and appropriate management.

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