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Intratesticular arteriovenous malformation: A rare benign testicular lesion in an adolescent male

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ABSTRACT

We present the clinical course and imaging findings of an intratesticular arteriovenous malformation found in an adolescent patient.

The patient presented for evaluation of a possible testicular mass. Evaluation included grayscale and Doppler ultrasound that demonstrated a vascular mass. Serum tumor markers were unremarkable. Magnetic resonance imaging was used to make the diagnosis of intratesticular arteriovenous malformation.

Intratesticular arteriovenous malformations are exceedingly rare, with only four other cases noted on literature review. This case presents unique findings including testicular microlithiasis and a history of cryptorchidism. The case was managed conservatively with ultrasound surveillance at six months.

1. Introduction

Testicular masses in adolescent and young adult males are of significant concern for malignant disease. Testicular cancer is the most common solid tumor in patients 15–34 years of age with an incidence of 5.6 cases per 100,000.[1] Presenting symptoms of testicular cancer can include pain in the testis or scrotum, firmness of the testis, a painless, solid mass in the scrotum, or scrotal swelling. Testicular cancer can also present as an incidental radiological finding.[1] Benign lesions such as hematomas, granulomas, or abscesses may at first cause suspicion for malignancy. One exceedingly rare benign lesion that may be mistaken for a malignant lesion is a testicular arteriovenous malformation (AVM).

There is a significant risk in misdiagnosing benign testicular lesions as cancer. Orchiectomy in the absence of true malignancy can expose the patient to unnecessary intraoperative risks including scrotal or retroperitoneal hematoma and infection, as well as the future risk of infertility and hypogonadism in the case of destruction of the remaining testis. We present the case of a young male patient who presented for a possible testicular mass that was subsequently diagnosed as an intratesticular arteriovenous malformation.

2. Case presentation

A 16-year-old male was seen in our pediatric urology department for a possible testicular mass. The patient described a painless mass on the superior portion of his right testis. Scrotal exam was normal with bilateral descended testes and no palpable masses as well as no scrotal lesions. When asked to point out the mass, the patient indicated his right epididymis. The patient's surgical history included an uncomplicated right orchiopexy for cryptorchidism at 11 years old.

Same day scrotal ultrasound revealed a right testis with a total volume of 9.8mL, consistent with prior history of cryptorchidism, and a left testis with a total volume of 17mL. A hypoechoic, solid, oval-shaped intratesticular lesion was noted on the right measuring 0.4cm × 0.4cm x 0.3cm that showed prominent vascularization on Doppler imaging. Punctate calcifications were also observed bilaterally and were more numerous on the right (Figs. 1 and 2). No masses were noted in the left testicle or on either epididymis. A small left varicocele was also identified. Beta human chorionic gonadotropin, alpha fetoprotein, and lactate dehydrogenase were all within normal limits.

Further imaging was used to evaluate the mass in light of the normal tumor markers. Magnetic resonance imaging with and without gadolinium contrast demonstrated an enhancing lesion of the posterior superolateral aspect of the right testis that followed the blood pool and

Abbreviations: AVM, Arteriovenous malformation.

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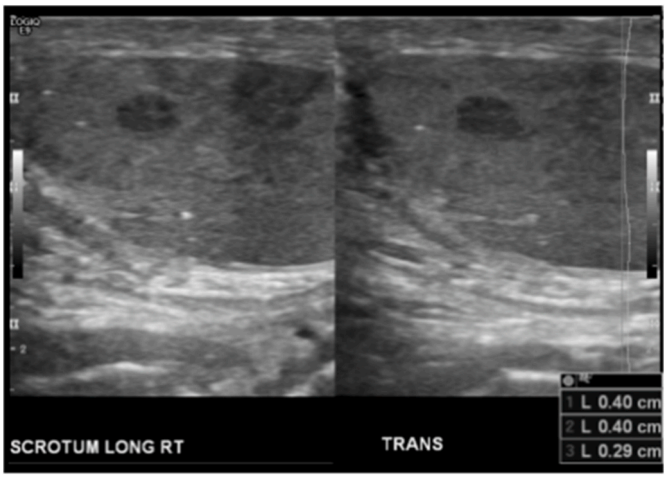

Fig. 1. Longitudinal grayscale image of right testis.

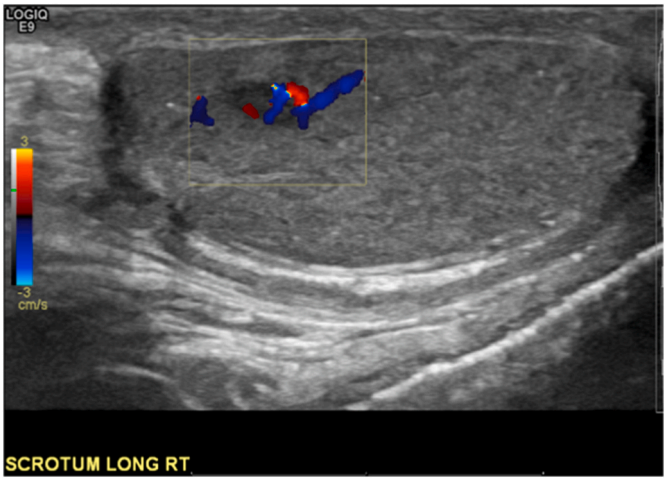

Fig. 2. Longitudinal Doppler image of right testis (use color in print). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

measured 0.8cm × 0.5cm by 1.0cm. No signal abnormality was noted in this region on non-contrast imaging. A small left varicocele was again noted on MRI (Fig. 3). When correlated with previous ultrasound findings, a probable diagnosis of intratesticular AVM was made.

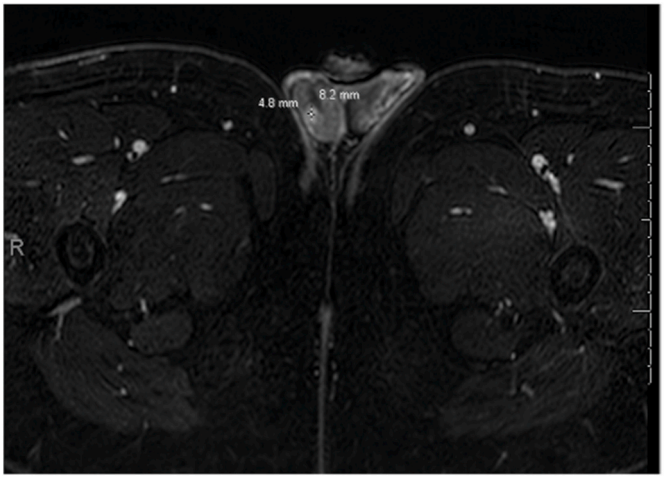

Fig. 3. Magnetic resonance imaging of scrotum showing the testicular lesion.

The patient was followed conservatively with a repeat scrotal ultrasound at three months. The new images showed no significant change from the original ultrasound findings. The decision was made to continue following the vascular lesion conservatively with a repeat ultrasound at six months.

3. Discussion

Intratesticular AVMs are an extremely rare finding. On ultrasound these lesions can appear as hypoechoic, vascular lesions. In an adolescent or young adult patient, any intratesticular mass should be regarded as malignant until proven otherwise. Confusion may arise, however, when clinical markers of testicular cancer return within normal limits after discovery of a mass.

A literature review produced four reports of intratesticular AVM to-date.[2–5] The age range of all reported cases was 15–39. In each case the AVM was found incidentally on ultrasound imaging. three of four patients in these cases presented for infertility evaluation,[2,3,5] whereas one patient presented for ultrasound evaluation after scrotal trauma.[4] Guidance for long-term management of intratesticular AVMs is very limited. One case report was found detailing a case followed over seven years with repeat imaging that showed an increase in vessel number with a very small increase in mass size. As the lesion remained asymptomatic, the investigators managed the case conservatively and avoided orchiectomy.[2]

Our patient demonstrated several novel findings when compared to other reports of intratesticular AVMs. To our knowledge this is the the first case of an AVM found in a patient with a prior history of cryptorchidism in the same testis. The testis was significantly smaller than the contralateral side (9.8mL versus 17mL), likely due to the history of cryptorchidism. Cryptorchidism is also associated with an increase in risk for testicular malignancy which was considered when evaluating this patient's lesion.[1] Ultrasound demonstrated bilateral punctate calcifications representing testicular microlithiasis within the patient's testes which were not demonstrated in other case reports on testicular AVMs.

The prior orchiopexy in the affected testis could itself explain the arteriovenous malformation. A suture placed during orchiopexy may have formed the arteriovenous malformation, thus offering an iatrogenic explanation for this rare lesion. The observed depth of the AVM is deeper than a typically placed suture for an orchiopexy, but this could still be a possible etiology of the lesion given variations in surgical technique. As there have been no other case reports of intratesticular AVMs after orchiopexy, this may be a unique case of a fistula formation presenting as a rare arteriovenous malformation.

4. Conclusion

In cases of suspected AVMs, imaging should be correlated with tumor markers and magnetic resonance imaging if needed to avoid unnecessary resection of a benign mass. While evidence for appropriate long-term management of testicular AVMs is very limited, conservative management with regular ultrasound studies provides a viable course of action that avoids inappropriate orchiectomy.

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Informed consent

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Registry and registration number of study/trial

N/A.

Declaration of competing interest

None.

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