



## Case Report

# Sonographic Appearance of Testicular Hemangioma: A Case Report

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## ABSTRACT

Tumors of the testes are the most common solid organ malignancy in young men. The first modality of choice for intratesticular masses is high-resolution sonography. The majority of intratesticular masses are malignant and ultrasound (US) remains the first-line modality for evaluation of these masses. While rare, benign testicular masses are important to recognize to avoid unnecessary workup and surgery. We present the case of a 38-year-old male with a testicular hemangioma, a rare benign testicular tumor. US and pathologic findings of this tumor are discussed.

**Keywords:** Ultrasonography, Testicular masses, Testes, Color Doppler, Testicular hemangioma

## INTRODUCTION

Most palpable testicular masses are malignant, with well described sonographic findings in the literature compared to more rare, benign testicular masses. Because benign palpable masses in the testes are rare entities, work-up often results in radical orchidectomy in favor of a more conservative approach. We present a case of a testicular hemangioma in a 38-year-old male patient. Sonographic imaging of a testicular hemangioma typically shows an hyperechoic lesion, often with internal vascularity on Doppler, which can help to differentiate this benign lesion from a malignant mass.

## CASE REPORT

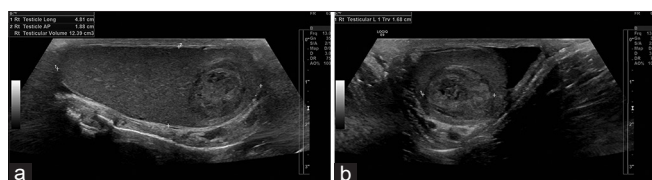
A 38-year-old male patient presented to an outpatient urology clinic with a firm mass noted in the right testicle. He denied pain, fever, chills, and dysuria. Serum tumor marker evaluation revealed an alpha-fetoprotein, lactate dehydrogenase, and  $\beta$ -human chorionic gonadotropin within normal range. Ultrasound (US) of the right testicle demonstrated an intratesticular heterogeneous mass [Figure 1]. Color Doppler demonstrated internal vascularity within the lesion [Figure 2]. Given suspicion for malignant testicular tumors, a radical orchiectomy was performed.

Grossly, a well-circumscribed nodule with bulging and hemorrhagic cut surfaces was identified within the lower pole of the testis measuring 1.4 cm×1.3 cm×0.9 cm in size. The nodule was located 0.2 cm from the tunica albuginea and it did not involve the tunica vaginalis or epididymis. The remaining testicular parenchyma was normal appearing. Microscopic pathological evaluation of the right testicle demonstrated a well-defined mass composed of

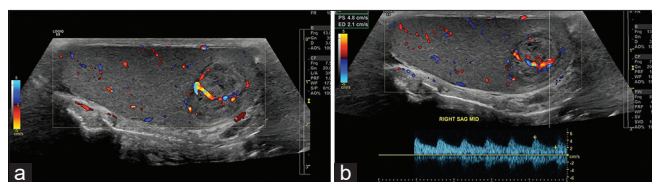
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closely-packed capillaries with extensive hemorrhage consistent with a benign capillary hemangioma. The background testicular parenchyma was normal. There was no evidence of germ cell tumor (GCT) or germ cell neoplasia *in situ* given negative staining for OCT3/4. The lesional cells were positive for cluster of differentiation 31, while negative for Sall-4 and D2-40. These pathology findings are presented in Figure 3.



**Figure 1:** A 38-year-old male with a palpable right testicular lump. (a) Grayscale ultrasound image of the right testis in longitudinal plane shows a well-circumscribed relatively hyperechoic lesion within the inferior pole measuring 1.4 cm×1.7 cm×1.6 cm. (b) Corresponding transverse plane grayscale image.



**Figure 2:** A 38-year-old male with a palpable right testicular lump. (a) Color flow Doppler longitudinal image of the R testis demonstrates a well-circumscribed relatively hyperechoic lesion within the lower pole of the right testis with internal vascularity. (b) Corresponding spectral Doppler image confirming internal flow.

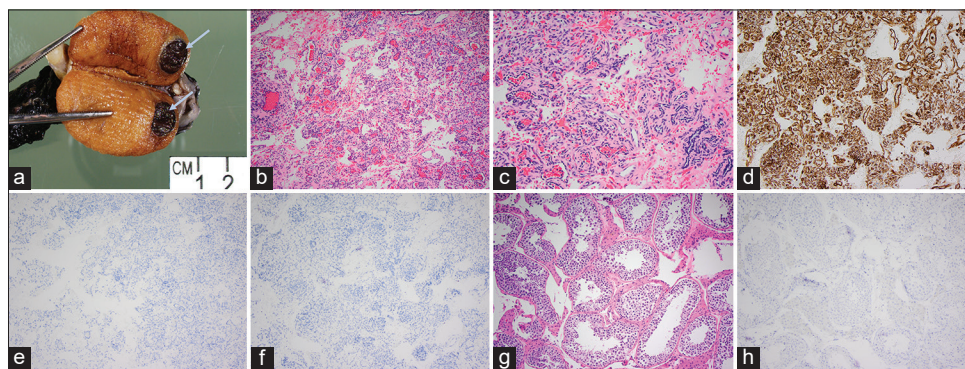
## DISCUSSION

Intratesticular hemangiomas are a rare entity with a handful of cases described in the literature, primarily in the pediatric population.<sup>[1]</sup> The majority of the described intratesticular hemangioma cases have been in patients below the age of 19 years.<sup>[2]</sup> There are four histological subtypes described in the pathologic literature: cavernous, capillary, epithelioid/histiocytoid, and papillary endothelial. The most common among these are capillary hemangioma.<sup>[2,3]</sup>

Testicular hemangiomas typically present as a painless intratesticular masses, rarely with bleeding or ulceration.<sup>[4]</sup> Serum tumor markers are often normal.<sup>[2]</sup> Given the high incidence of malignant testicular tumors, these lesions often lead to an extensive metastatic workup of the patient. Recognition of benign testicular tumors, while rare, is essential in avoiding unnecessary patient anxiety, diagnostic workup, and unindicated orchiectomy.<sup>[2,5]</sup>

Our 38-year-old patient presented with a painless testicular mass, with arterial flow noted within a hyperechoic lesion on Doppler US [Figure 2]. Differential for a hyperechoic intratesticular mass includes lipoma, epidermoid cyst, testicular hemangioma, seminoma, sex cord-stromal tumors, and primary GCTs. High-frequency ultrasonography, often with color and power Doppler, has a central role in differentiating these entities given that it is the imaging modality of choice for evaluation of the scrotum.<sup>[6,7]</sup>

On US, testicular hemangiomas typically appear as heterogeneously hyperechoic masses, usually without



**Figure 3:** A 38-year-old male with a palpable right testicular lump. The histology shows a benign vascular lesion consisting of closely packed capillary vessels. Red blood cells are appreciated within the vessel. No cytological atypia is identified. (a) Gross pathologic specimen shows a bisected right testicle with attached spermatic cord partially seen. In the lower pole of the testicle, there is a well-circumscribed bisected nodule (arrows) with bulging and hemorrhagic cut surfaces. It does not involve the tunica vaginalis or epididymis. (b) ×10 of the microscopic specimen showing closely packed capillaries. (c) ×20 of the microscopic specimen showing dense capillaries with hemorrhage. (d) The vascular lesion shows positivity of cluster of differentiation 31, which is a vascular endothelial marker. Positive controls for the stains and negative tissue elements have been both evaluated and are adequate for diagnosis. (e) The lesional cells are negative for D2-40, which are a lymphatic endothelial marker. (f) The lesional cells are negative for SALL-4, which are a germ cell tumor marker. (g) The background testicular parenchyma shows normal spermatogenesis and negative for germ cell neoplasm *in situ*. (h) The background testicular parenchyma is negative for OCT3/4, which is a marker for germ cell neoplasm *in situ*.

internal flow on Doppler imaging.<sup>[4]</sup> When hemangiomas demonstrate flow on Doppler imaging, these can be difficult to distinguish from malignant tumors. However, vascularity in hemangiomas is not tumoral. Furthermore, it is important to remember that hemangiomas are comprised of capillaries, which are usually too small to detect on Doppler US. In some cases, hemangiomas can develop arteriovenous fistulas (AVF), making them visible on color and spectral Doppler imaging [Figure 2b]. This explains the findings in our case.

On the contrary, epidermoid cysts classically present with an onion ring appearance on US and lack internal flow on Doppler imaging.<sup>[8]</sup> Seminomas typically present as hypoechoic, well-circumscribed masses with marked internal flow.<sup>[9]</sup> Lipomas appear as hyperechoic, well-circumscribed masses without internal flow.<sup>[10]</sup> Sex cord-stromal tumors are derived from Sertoli and Leydig cells. On US, they are typically discovered incidentally as well-circumscribed homogeneous hypoechoic lesions with internal vascularity.<sup>[11]</sup> Primary GCTs arise from spermatogenic cells and are divided into seminomatous and nonseminomatous types.<sup>[11]</sup> On US, GCTs typically appear as heterogeneous masses, some with internal calcifications and cystic components. Increased vascularity may or may not be seen, making them a diagnostic challenge.<sup>[11]</sup>

While our patient did not undergo further imaging evaluation, there is growing evidence for use of contrast-enhancing US (CEUS) as well as strain elastography to further differentiate testicular hemangiomas from other testicular masses. CEUS findings of testicular hemangiomas include a unique peripheral nodular pattern of enhancement on arterial phase with slow clearance in venous phase.<sup>[12,13]</sup> This is consistent with CEUS findings of hemangiomas in other organs. Strain elastography of testicular hemangiomas typically demonstrates a soft lesion, which is more suggestive of a benign testicular lesion. The use of additional US imaging tools can help to further differentiate benign lesions from malignant masses.<sup>[12]</sup>

## CONCLUSION

While rare, it is important for radiologists to be familiar with the sonographic appearance of testicular hemangiomas, particularly when they demonstrate internal vascularity to avoid unindicated orchiectomies and diagnostic workup. Capillary flow can be difficult to visualize on Doppler US, which leads to most capillary hemangiomas appearing avascular. However, as we have described above, capillary hemangiomas can develop internal AVFs, leading to a vascular appearance on Doppler imaging.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

## Conflicts of interest

Dr. Vikram Dogra is on the Editorial Board of the Journal.

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