Enucleation of schwannoma of the penis with neurovascular bundle sparing using the VTI 20 MHz Microvascular Doppler System

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Abstract: A 48-year-old man had an unremarkable past medical history. His current illness began 8 years prior to medical consultation with a non-painful, progressive increase in volume at the base of the penis in the dorsal region. The patient had adequate erections but was unable to perform coitus due to the presence of a mass. He complained of no other symptomatology. Physical examination revealed an uncircumcised cylindrical penis and a central meatus. A non-painful, mobile, stony hard tumor measuring approximately 6 cm × 5 cm was located at the dorsal region of the base of the penis. It was not fixed to the deep planes and there were no color changes. MRI of the penis identified a round, solid, well-circumscribed tumor with a heterogeneous content and extremely vascularized aspect. It was not dependent on the corpora cavernosa but caused compression and displacement to the left. The penile tumor was completely extirpated using the VTI 20 MHz Microvascular Doppler System, sparing the neurovascular bundles. The histopathologic report and immunohistochemistry study confirmed the diagnosis of Schwannoma of the penis. At follow-up at more than two years, the patient has no signs of tumor activity and erections are adequate.

Keywords: Neurilemmoma; penile neoplasm; peripheral nerve sheath tumor; schwann cell tumor

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Introduction

Schwannomas are encapsulated tumors of the nerve sheaths that derive from Schwann cells, whose function is to preserve the myelin layer of the peripheral neurons. This type of tumor can be benign or malignant and may arise in any part of the body, but penile origin is rare (1,2). The incidence of schwannomas is low, at 0.6 per 100,000 persons annually, and they occur mainly in the extremities and the neck. There are very few cases involving the penis. At present, fewer than 35 tumors with penile location have been reported (3). We present herein the case of a 48-year-old man that presented with schwannoma of the penis. He underwent Doppler ultrasound and magnetic resonance imaging. The lesion was completely resected, with intraoperative neurovascular bundle identification and preservation, utilizing the VTI 20 MHz Microvascular Doppler System.

Case presentation

A 48-year-old man complained of a gradual increase in volume at the dorsal surface of the base of the penis over an 8-year period. It was painless and he had no erectile problems or loss of penile sensitivity, but by the time he

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Figure 1 Clinical image of the penile schwannoma.

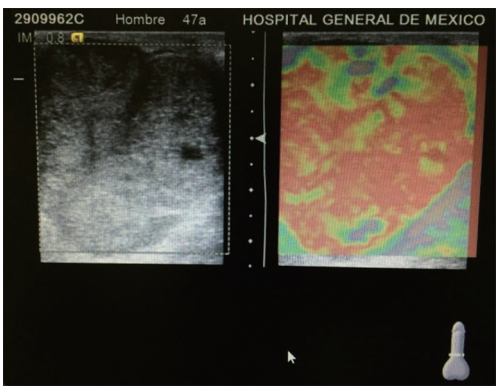

Figure 2 Doppler ultrasound of the penis showing a circumscribed and highly vascularized lesion.

sought medical attention at our hospital the large size of the mass prevented him from engaging in coitus (*Figure 1*).

Doppler ultrasound revealed a heterogeneous, highly vascularized tumor measuring 6 cm × 5 cm that deformed the corpora cavernosa, but did not appear to depend on them (*Figure 2*).

The magnetic resonance imaging scan confirmed the finding of a round, well circumscribed, highly vascularized solid mass with heterogeneous content at the dorsum of the penis that did not depend on the corpora cavernosa but displaced and compressed the left one (*Figures 3*,*4*).

During the surgery, a Z-shaped incision was made on the dorsal surface of the penis (*Figure 5*), and dissection was performed between the skin and Buck's fascia, adequately

Figure 3 Magnetic resonance imaging scan showing the displacement of the left corpus cavernosum.

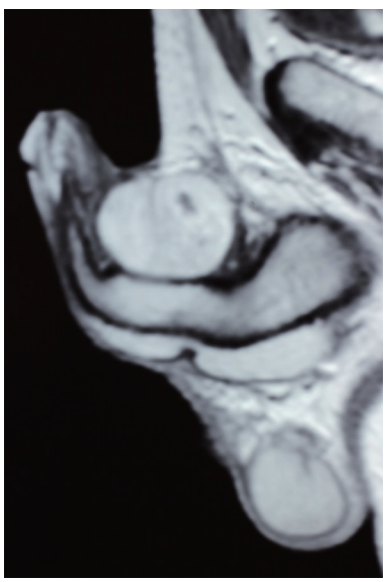

Figure 4 Magnetic resonance imaging scan showing the interphase or separation between the tumor and the corpus cavernosum.

exposing the tumor (*Figure 6*).

Using the VTI 20 MHz Microvascular Doppler System and vascular ties as reference points, the neurovascular bundles adjacent to the mass were identified (*Figure 7*). The tumor had a soft, firm capsule that enabled total enucleation, with no need for tunica albuginea resection.

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Figure 5 Z-shaped incision in the skin.

Figure 6 Careful tumor dissection.

Figure 7 Isolation of the neurovascular bundle.

Fine hemostasis was performed with microbipolar and conventional monopolar electrocautery. Buck's fascia and the skin were closed with 4-0 Vicryl continuous suture.

The histopathologic analysis confirmed the diagnosis of schwannoma of the penis with Antoni A and Antoni B fibers and the immunohistochemical SP 100 and peroxidase antibody were positive (*Figure 8*).

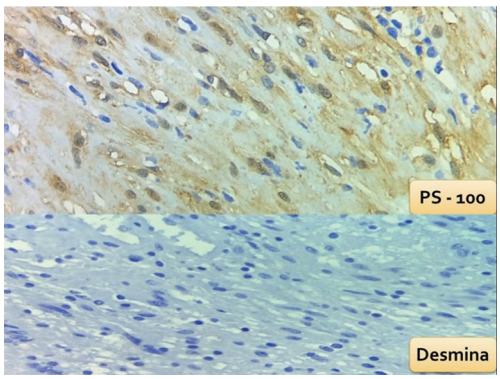

Figure 8 Histopathological findings.

Figure 9 Image two years after surgery.

At the follow-up at 2 years after surgery, the patient presented with no signs of tumor activity and had adequate erectile function (*Figure 9*).

Discussion

Schwannomas of the penis generally present as a slow-growing, painless mass located at the dorsum of the penis. Patients with this pathology usually seek medical attention when tumor growth hinders or impedes sexual activity. Most schwannomas are benign, but cases of malignant behavior have been reported (3). Certain characteristics observed in preoperative magnetic resonance imaging scans can lead to suspicion of schwannoma (4), but its diagnosis is usually made through histopathologic analysis of the surgical specimen.

The main concern of the patient in relation to penile schwannoma management is the preservation of sexual function. Achieving excellent cosmetic results sometimes

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requires more extensive surgery that can compromise sexual function.

In the present case, neurovascular structure-sparing surgery was performed, using the VTI 20 MHz Microvascular Doppler System, which we regularly employ during microscopic varicocele ligature. Marshall *et al.* described a case of penile schwannoma resection with neurovascular bundle-sparing (5), but ours is the first case report on neurovascular bundle preservation with the intraoperative use of the Doppler system. The tumor was removed without damaging adjacent anatomic structures and erectile function was preserved. The patient continues to have adequate erectile function at the follow-up 2 years after the surgery.

Schwannomas of the penis are rare tumors that have an excellent prognosis. Sexual function preservation is one of the main concerns of the patient in relation to surgical treatment. The intraoperative use of the Microvascular Doppler System is a viable option for maintaining the neurovascular structures intact during the surgery, thus preserving sexual function.

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Footnote

Conflicts of Interest: The authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/amj.2018.08.06). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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