Oncology

Serous Borderline Tumor of the Testis and Associated Magnetic Resonance Imaging Findings

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Abstract

Serous borderline tumor (SBT) of the testis is a rare, ovarian epithelial-type tumor of the testis. We present a case of SBT after radical orchiectomy in a 59-year-old man who had 3-month progressive enlargement of his right hemi-scrotum, negative testicular tumor markers and scrotal ultrasound equivocal for malignancy. Magnetic resonance imaging (MRI) of the pelvis was obtained to aid with evaluation and showed marked hyperintensity on T2-weighted images with frond-like nodular peripheral enhancement within right testis mass. These distinct MRI findings can help clinicians differentiate SBT from other testis tumors. Relapse has not been observed in 8 years of follow-up.

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Introduction

Serous borderline tumor (SBT) of the testis is a rare, ovarian epithelial-type tumor of the testis arising from mesothelial elements which shares similar histological features to serous epithelial tumors of the ovaries. Management of this tumor involves evaluation of tumor markers, scrotal ultrasound, computerized tomography (CT) to detect for lymphadenopathy and metastases, and radical orchiectomy. However, magnetic resonance imaging (MRI) of the pelvis associated with SBT has not been previously reported. We present a case of a 59-year-old man with SBT of the testis in which surgical therapy has been combined with strict 8-year follow-up.

Case presentation

A 59-year-old man presented with a progressive enlargement of his right hemi-scrotum for three months. The patient denied any history of pain, fevers, or weight loss. Physical examination revealed a normal left testis and a slightly tense right hydrocele without a palpable right testis. The serum alpha fetoprotein (AFP) and beta-human chorionic gonadotropin (β-HCG) levels were within normal limits. On ultrasonography (US) of the scrotum, the right testis measured 5.4 × 4.0 × 4.9 cm. Within the central right testis, there is a large hypoechoic collection measuring 4.3 × 3.2 × 3.8 cm demonstrating internal echoes and peripheral nodularity. Differential diagnosis was hematoma vs sequelae of previous infection or trauma (Fig. 1). Because the US was equivocal for malignancy, MRI of the pelvis (with focus on testes) with and without gadolinium was obtained.

The MRI of the pelvis demonstrated a 4.6 × 4.0 × 4.5 cm mass within the right testis corresponding to the mass detected on US which was mildly hyperintense on T1-weighted images prior to contrast administration and markedly hyperintense on T2-weighted images (Fig. 2). There was one internal enhancing septation and some areas of frond-like nodular peripheral enhancement within the mass suggesting malignancy. Because these findings were suggestive of malignancy, the patient underwent right radical orchiectomy.

On gross examination, an enlarged testicle weighing 64 g and measuring 7.5 × 5.0 × 5.3 cm was found. A 4.8 cm monocellular cyst filled with yellow-green viscous material was present within the testis. The inner surface demonstrated a multinodular appearance, with nodular areas ranging in size from 1 to 3 mm in diameter. The rest of the testicular parenchyma, spermatic cord, and epididymis were unremarkable. Microscopically, multiple intracytic rounded papillae with hyalinized fibrovascular cores and branching architecture were present. The papillae were lined by stratified columnar cells with mild cytologic atypia and no significant mitotic activity. There was no evidence of stroma invasion or psammoma bodies identified. The morphologic features were similar to its ovarian...
counterpart. Immunohistochemical stains exhibited immunoreactivity for PAX-8 and WT-1 and negativity for calretinin and D2-40 in the tumor cells, supporting a Mullerian origin of the tumor. Final histopathological diagnosis was serous borderline tumor (Fig. 3).

Due to the uncertain malignant potential of SBT of the testis, the patient underwent strict radiographic follow-up. At present, 8 years after surgery, the patient is clinically free of disease without any documented signs of recurrence or metastasis on scrotal ultrasound or CT scan.

Discussion

Ovarian–type epithelial tumors of the testis are very rare entities and serous borderline tumors are the most common subtype. Though most cases tend not to recur or metastasize, cases of focal transition into invasive cancer and development of metastatic disease have been reported in the literature when invasion was present on histopathology.2

The most common presentation of this tumor is painless swelling of the testis with or without accompanying hydrocele. The first imaging study is ultrasonography which is used to distinguish intratesticular from extratesticular masses. Though a solid intratesticular mass with internal vascularity is highly suggestive of a testicular tumor, US cannot be reliably used to predict tumor histology. Furthermore, it can be challenging to differentiate testicular tumors from non-tumorous lesions on US. In cases where US findings are equivocal, MRI can provide additional information. Recent studies have described the utility of MRI for the characterization of testicular masses. Tsili et al. evaluated the performance of MRI in predicting the histological type of testicular tumors and found 91% success rate at differentiating seminomatous from nonseminomatous tumors with excellent intra-observer agreement.3 Seminomatous tumors are typically isointense on proton-density images and hypointense and homogenous on T2-weighted images. Nonseminomatous tumors are characterized by marked heterogeneity and variable intensity on both proton-density and T2-weighted images.4

MRI was performed to further evaluate our patient’s primary lesion since the US findings were equivocal. The pattern of mild hyperintensity on pre-contrast T1-weighted images and marked hyperintensity on T2-weighted images is a pattern not associated with seminomatous or nonseminomatous tumors. The T1-weighted findings suggested the presence of hemorrhage or protein while the T2-weighted imaging detected fluid. Most of the mass did not enhance, except for one internal enhancing septation and several enhancing peripheral nodules.

Serous borderline tumors of the testis are rare tumors and to the best of our knowledge, this is the first reported case of SBT of the testis with associated MRI findings. With the expanding role of MRI in the evaluation of testicular masses, particularly following equivocal US findings, there is a need to characterize the typical findings associated with SBT of the testis. The current standard of care for SBT of the testis is orchiectomy and the literature reports no cases of recurrence or metastasis when the tumor is confined to the testis.5 Establishing a pattern of MRI findings for this rare tumor can aid in the process of determining whether a testicular lesion requires orchiectomy, testicular-sparing surgery, or surveillance.
Conclusion

In conclusion, serous borderline tumor of the testis is a rare tumor, with fewer than 50 reported cases, albeit one with a favorable prognosis. As in previous case reports, ultrasound and tumor markers results may be equivocal. Unique MRI findings may help differentiate SBT of the testis from other benign and malignant tumors.

Conflict of interest

None.

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