

## Oncology

# Carcinosarcoma of the Tunica Vaginalis Following Radiation Therapy for Localized Prostate Cancer



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## ABSTRACT

Spermatic cord tumors (SCTs) are rare neoplasms with 80% exhibiting benign pathology. Of the malignant SCTs, 90% are sarcomas. To date there has only been one documented case of primary CS of the spermatic cord which occurred in a 40 year old with no reported medical history. A 76-year-old male with a history of biopsy proven Gleason score 7 (3 + 4) prostatic adenocarcinoma underwent external beam radiation therapy (7920 cGy) in 44 fractions in 2004. He presented with a 3 year history of an asymptomatic right hydrocele. Several scrotal ultrasounds had been performed confirming a hydrocele, with the most recent revealing a hydrocele measuring 10 × 14 cm and several epididymal cysts. During the hydrocelectomy a firm suspicious mass was noted inside the tunica vaginalis and involving the spermatic cord. Given the intraoperative findings, decision was made to proceed with radical orchiectomy. Final pathologic examination revealed the tumor to have a biphasic pattern composed of spindled cells and also cells with an epithelioid morphology. Five months following orchiectomy he patient presented with a painful, enlarging right upper scrotal mass. A CT scan revealed new soft tissue lesions suspicious for necrotic lymph nodes within the right inguinal canal. Additional metastatic evaluation revealed multiple new pleural and parenchymal lung nodules. CT guided needle biopsy of a left lung nodule demonstrated spindle cells with high cellularity and areas of necrosis which were histomorphologically similar to the previous scrotal CS. Gemcitabine therapy was subsequently started. Four months following the diagnosis of metastatic CS, the patient expired. Dedifferentiation of prostatic adenocarcinoma to prostatic CS should be considered as a treatment outcome after localized radiation therapy to the prostate due to the highly aggressive nature of metastatic CS.

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## Introduction

Spermatic cord tumors (SCTs) are rare neoplasms with 80% exhibiting benign pathology.<sup>1</sup> Of the malignant SCTs, 90% are sarcomas.<sup>1</sup> A carcinosarcoma (CS) is a histologic subtype containing a mixture of malignant epithelial and sarcomatoid/mesenchymal cellular elements.<sup>2</sup> CS rarely involves the genitourinary system.<sup>1–3</sup> To date there has only been one documented case of primary CS of the spermatic cord which occurred in a 40 year old with no reported medical history.<sup>3</sup>

Less than 100 cases of prostatic CS have been documented in the literature. Interestingly, this rare tumor has been noted in men with a prior history of prostatic adenocarcinoma who have undergone

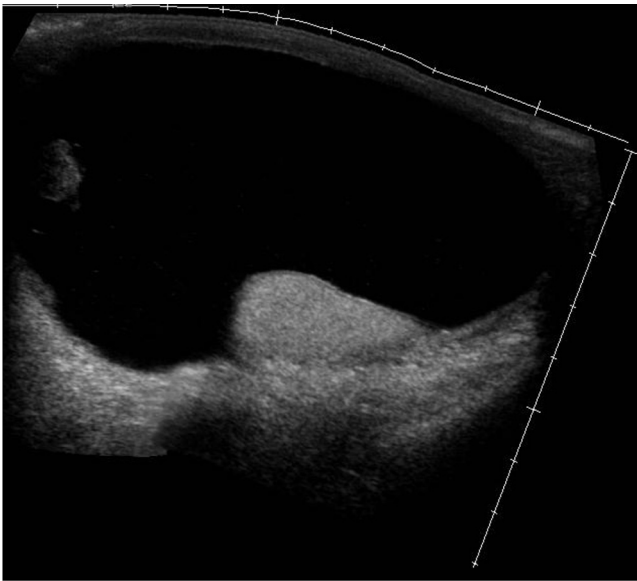
non-surgical therapy.<sup>2</sup> It remains unclear whether prostatic CS results from dedifferentiation related to radiation therapy, androgen ablation,<sup>2</sup> or arises as a de novo primary tumor of the prostate. Notably, there has been no reported case of metastatic prostatic CS involving the spermatic cord.<sup>2</sup> Herein we present the first description of CS involving the spermatic cord in a man with a history of adenocarcinoma of the prostate treated with radiation therapy.

## Case presentation

A 76-year-old male with a history of biopsy proven Gleason score 7 (3 + 4) prostatic adenocarcinoma underwent external beam radiation therapy (7920 cGy) in 44 fractions in 2004. His pre-treatment PSA was 5.7. Following radiation therapy, there was no evidence of metastatic disease; the PSA fluctuated with a high of 3.5 and the nadir was 1.94. He presented with a 3 year history of an asymptomatic right hydrocele. Several scrotal ultrasounds had been performed confirming a hydrocele, with the most recent revealing a

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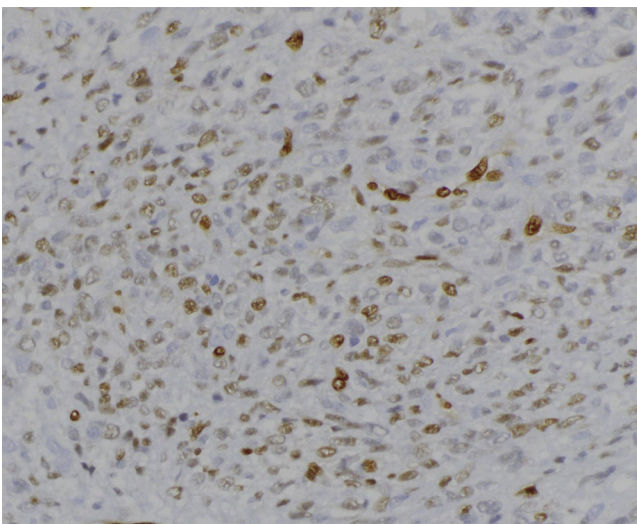


**Figure 1.** Ultrasound of the scrotum showing massive hydrocele.

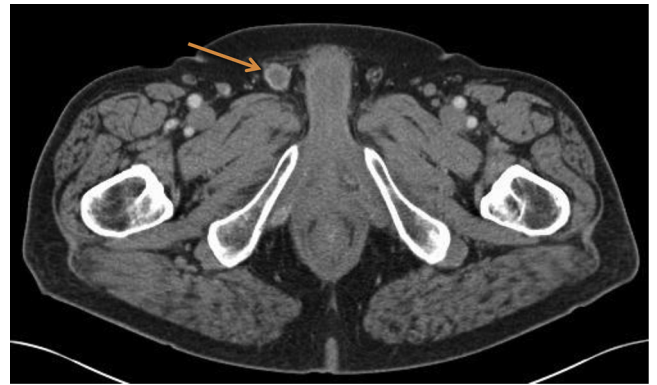
hydrocele measuring 10 × 14 cm and several epididymal cysts (Fig. 1). Approximately a year after his most recent ultrasound, he developed severe scrotal pain. Physical exam revealed a large, tense, tender right hydrocele with overlying skin erythema and spermatic cord thickening. Levaquin was started with a presumptive diagnosis of acute epididymitis. He did not improve after several weeks of antibiotics, so a scrotal exploration with likely hydrocelectomy was recommended.

During the hydrocelectomy a firm suspicious mass was noted inside the tunica vaginalis and involving the spermatic cord. Given the intraoperative findings, decision was made to proceed with radical orchiectomy. Frozen pathology was suspicious for malignant mesothelioma based largely on the gross examination findings with negative cord margins.

Final pathologic examination revealed the tumor to have a biphasic pattern composed of spindled cells and also cells with an



**Figure 2.** The tumor is positive for ERG on immunostaining.



**Figure 3.** CT with contrast of the right inguinal canal with arrow showing suspected 1.9 cm necrotic lymph node.

epithelioid morphology. Interestingly, one of the very few positive markers in this case was ERG that was expressed focally within the neoplasm (Fig. 2). PSA staining and other markers of vascular differentiation were negative. ERG is expressed in prostatic adenocarcinoma in roughly 50% of cases in addition to endothelial cells, and has superior diagnostic utility compared to PSA staining when confirming metastatic epithelial origin in high grade prostatic carcinomas as PSA is often negative.<sup>4</sup> As other vascular markers were negative within the neoplasm, given the patient's prior history of radiation treated prostatic adenocarcinoma, the spermatic cord/tunica vaginalis CS was likely prostatic origin and favored to represent a metastasis. Multiple tumor foci were noted with the largest being in the tunica vaginalis measuring 6.5 cm in diameter. A small focus suspicious for lymphovascular invasion was also seen.

Following orchiectomy, complete staging was performed with negative computerized tomography (CT) scan of the chest, abdomen and pelvis as well as a bone scan. Tumor board decision was made to forego additional treatment since he had no measurable disease and negative margins. Active surveillance with routine physical exam, CT with contrast of the chest, abdomen, and pelvis demonstrated no evidence of metastatic disease. Five months following orchiectomy he patient presented with a painful, enlarging right upper scrotal mass.

Physical exam revealed a normal left testicle and a firm, tender, 2 cm mobile mass in the right scrotum and groin. PSA was 1.94 at this time.

A CT scan revealed new soft tissue lesions suspicious for necrotic lymph nodes within the right inguinal canal (Fig. 3). Additional metastatic evaluation revealed multiple new pleural and parenchymal lung nodules. CT guided needle biopsy of a left lung nodule demonstrated spindle cells with high cellularity and areas of necrosis which were histomorphologically similar to the previous scrotal CS. Gemcitabine therapy was subsequently started. Four months following the diagnosis of metastatic CS, the patient expired.

## Discussion

There has only been one previously documented case of CS of the spermatic cord.<sup>3</sup> The current case demonstrates a CS of the spermatic cord in a patient following external beam radiation therapy for prostatic adenocarcinoma. Despite the aggressive nature of genitourinary CS, the patient presented with only a hydrocele and no other evidence of metastatic disease initially. Importantly, the proto-oncogene ERG, was expressed focally in this patient's tumor. As this marker is expressed in approximately 50%

of prostatic carcinomas and is fairly specific, its expression in the CS suggests dedifferentiation and metastatic spread of treated prostatic adenocarcinoma. ERG staining.

The origin of prostatic CS is thought to be derived from a single cell, rather than from a tumor of epithelial origin and a tumor of sarcomatoid origin.<sup>2</sup> Interestingly, 65% of reported cases of prostatic CS had a prior history of prostatic adenocarcinoma.<sup>2</sup> Nearly 75% of those with prostatic adenocarcinoma who later developed prostatic CS received external beam radiation or external beam radiation and hormone therapy.<sup>2</sup> Approximately 40% of those with prostatic CS developed metastatic disease.<sup>2</sup> These previous reports suggest that prostatic adenocarcinoma can dedifferentiate into prostatic CS following localized radiation therapy.

### Conclusion

This report demonstrates a CS of the spermatic cord following localized radiation therapy to the prostate. A primary CS of the spermatic cord is unlikely in this patient as the clinical and pathologic history suggest dedifferentiation. This is the second documented case of CS of the spermatic cord, and the first case reported

with a probable origin being metastatic prostatic CS. Dedifferentiation of prostatic adenocarcinoma to prostatic CS should be considered as a treatment outcome after localized radiation therapy to the prostate due to the highly aggressive nature of metastatic CS.

### Consent

Consent was obtained from the patient for this case report.

### Conflicts of interest

The authors have no conflicts of interest to disclose.

### References

1. Arlen M, Grabstald H, Whitmore WF. Malignant tumors of the spermatic cord. *Cancer*. 1969;23:525.
2. Hansel DM, Epstein JI. Sarcomatoid carcinoma of the prostate: a study of 42 cases. *Am J Surg Pathol*. 2006;30:1316.
3. Nistal M, Burgos F, Paniagua R. Carcinosarcoma of the spermatic cord. *Urol Int*. 1990;45:313.
4. Rodrigues DN, Hazell S, Miranda S, et al. Sarcomatoid carcinoma of the prostate: ERG fluorescence in-situ hybridization confirms epithelial origin. *Histopathology*. 2015;66:898.