Case Report: Primary pure angiosarcoma of the testis

Samay Jain ∗†, Richard Cantley ‡, Justus Philip ‡

† Department of Urology, and ‡ Department of Pathology, University of Toledo Health Science Campus, Toledo, OH, 43614

Angiosarcoma is an aggressive soft-tissue sarcoma that is composed of malignant endothelial cells of vascular or lymphatic origin. Angiosarcomas are rare tumors, comprising only 1% of soft tissue sarcomas (1). These tumors are found primarily in the head and neck followed by breast, the extremities, and trunk (2). Angiosarcomas are frequently associated with prior radiation therapy and chronic lymphedema, particularly in the breast (2). They can also arise in organs, most commonly liver, as well as the heart, spleen, and lung. Angiosarcoma of the testis is exceedingly rare, with only scattered case reports in the literature.

Case Report
A 63-year-old male presented with an enlarged right testicle. He reported a history of firmness in the testicle for over 10 years. However, over the preceding eight months, the testicle had rapidly enlarged to 11 cm in size. Pre-operative work up with an ultrasound and staging CT scan showed a solid lesion occupying the testicle and no evidence of metastases, respectively. β-HCG and AFP levels were within normal limits. The patient did not have a history of chronic lymphedema or prior radiation therapy. Furthermore, there was no known exposure history to vinyl chloride, thorium dioxide, arsenic, radium, or anabolic steroids. He underwent an inguinal right radical orchiectomy without incident. During the procedure, several lymph nodes were discovered at the level of the internal inguinal ring. These lymph nodes were palpably abnormal and were subsequently removed for examination. Although not standard protocol, the patient’s anatomy lent itself to node sampling.

Materials and Methods
Light microscopic images were obtained using standard H&E staining protocols on paraffin-embedded tissue sections. Immunohistochemistry analysis involved using antibodies to: CD31, CD34, pan-keratin, calretinin, AFP (alpha fetoprotein), and PLAP (placental alkaline phosphatase) with appropriate positive and negative controls. Additionally, Fluorescence In situ Hybridization (FISH) Analysis for Chromosome 12p was performed.

Pathology
A gross depiction of the testicle following right radical orchiectomy is shown in Figure 1. The testis measured 11 x 8.5 x 7 cm and weighed 514 grams. The cut surface of the testis was red-tan to black and hemorrhagic, alternating with areas of white, solid fibrotic tissue. No residual normal appearing testicular tissue was noted. The spermatic cord and epididymis appeared uninvolved by tumor. Four pelvic lymph nodes were also received separately.

Figure 1: The orchiectomy specimen covered with a smooth red-tan intact tunica vaginalis. The cut surface revealing areas of hemorrhage, necrosis, and white, solid fibrotic tissue. No residual testicular tissue is grossly identified. The adjacent spermatic cord and epididymis was grossly uninvolved by tumor.

Microscopic examination revealed that the tumor was composed of a high-grade spindle cell neoplasm. The tumor had biphasic growth, including areas with large vascular spaces (Figure 2) and more solid areas filled with spindle cells and smaller slit-like vascular channels (Figure 3). The tumor cells showed marked nuclear pleomorphism, and frequent mitoses. Extensive geographic necrosis

---

1 To whom correspondence should be sent: Samay.Jain@utoledo.edu

Author contributions: SJ was responsible for the research protocol. SJ, JP and RC were responsible for collecting study data; RC and SJ supervised the data analysis. All authors contributed to the manuscript and SJ takes responsibility for the paper as a whole.

The authors declare no conflict of interest

Freely available online through the UTJMS open access option
Chromosome 12p alterations are one of the earliest changes in germ cell tumors and are present in virtually all testicular tumors of germ cell origin (6). The lack of isochromosome 12p in this case further supports our interpretation of a pure angiosarcoma without a germ cell component. A review (3) of the 5 previously reported testicular angiosarcomas suggested two groups of patients with different age ranges. The first group, which includes 3 of the reported 5 cases, consists of young patients (average age of 21) that have angiosarcomas arising from teratomas or other germ cell neoplasms. The second group, which includes 2 of the 5 reported cases, consists of elderly patients (average age of 76) with angiosarcomas of non-germ cell origin. Our case of a 63-year-old male, with a primary angiosarcoma of the testicle with non-germ cell origin is congruent with the second group described.

Angiosarcomas are aggressive tumors, having an overall 5-year survival of 35% in all sites (2). Treatment involves complete surgical resection with wide margins due to the multifocal and invasive nature of the tumor. High-dose radiation over a wide area is typically employed following surgical excision except in cases of radiation-induced angiosarcomas. Adjuvant chemotherapy has no demonstrated survival advantage. However, for metastatic disease, the primary treatment is chemotherapy, using mainly doxorubicin or a taxane (2, 7).

In the testicle, the primary treatment for angiosarcomas has been radical orchiectomy. Of the five previously reported cases, each underwent complete resection with negative margins, and two received adjuvant chemotherapy, both of whom were young patients with germ cell tumor-associated angiosarcomas. Of the five previous patients, three were alive and without disease with an average of 17 months follow up, one died a month after diagnosis from a stroke, and one had metastatic disease to the lung at four months follow up (3). Our patient recovered well from his surgery, but presented with symptoms of back and hip pain within three months of surgery. The patient’s pre-operative CT scan was negative for metastasis but his planned three-month post-operative PET and CT scan were positive for widely metastatic disease in the bones, which accounted for his symptoms. His performance status rapidly declined, and consequently, he was not a candidate for chemotherapy. Also, he was not interested in pursuing systemic chemotherapy. At most recent follow up, he had been placed in hospice care.

We are aware of only five previously reported cases of angiosarcoma of the testicle which share the morphologic and immunohistochemical features of angiosarcomas in other locations. In the rare cases reported in the literature, angiosarcoma is associated with germ cell tumors in young men while it arises de novo in older men, with
our case falling into the latter category. In summary, we report a case of pure angiosarcoma of the testicle, an exceedingly rare diagnosis. Angiosarcoma is an aggressive malignancy with poor outcomes in most locations. However, due to its rarity, it is difficult to speculate on expected outcome in testicular angiosarcoma.

ACKNOWLEDGMENTS. Special thanks to Abdelraof Alagha for assistance with gross images.