A Rare Primary Osteogenic Sarcoma of the Prostate and Bladder

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Abstract

- Bladder cancer and prostate cancer are among the most common malignancies in the United States and affects the global population.
- Urothelial carcinoma and adenocarcinoma are the typical histological findings for bladder cancer and prostate cancer, respectively.
- It is known that radiation exposure for treatment of malignancy predisposes to secondary malignancies.
- Here in, we present a case of variant histology of genitourinary cancer in a patient previously treated for prostate cancer with radiation therapy.
- Our patient developed hematuria and was found to have a calcified bladder mass revealing osteosarcoma on pathology review.
- He underwent subsequent resection due to local recurrence, cystoprostatectomy and adjuvant chemotherapy.
- He developed progression with multi-organ metastases despite adjuvant chemotherapy and elective palliative care 10 months after initial presentation of hematuria.
- This case will discuss a rare entity in genitourinary cancers and highlight sequela of radiation therapy for more common genitourinary malignancies.

Introduction

- Mesenchymal tumors of the genitourinary tract are rare and account for 0.04% of all bladder malignancy and to date there have been 35 documented cases. (1)
- The tumor typically presents with hematuria, involves the trigone, and has a 4:1 male to female predominance . Associated risks for osteosarcoma of the bladder include prior radiation therapy and history of urinary schistosomiasis (2).
- Previous reviews reveal an average age of onset of 62 years (3)
- Mesenchymal neoplasm of the prostate is exceedingly rare with few documented cases (4).
- Macroscopically, the tumor is characterized as large, polyploid and infiltrative (2)
- Microscopically, it is characterized by arising from soft tissue not attached to bone or periosteum, with uniform sarcomatous patter, with osteoid or cartilage matrix. (5).
- Differential diagnosis includes sarcomatoid urothelial carcinoma and urothelial carcinoma with osseous metaplasia (2).
- Histological staining for osteosarcoma is negative for pan-cytokeratin 7 and 20, epithelial membrane antigen, smooth muscle actin, desmin, CD34 and CD68. And it strongly express vimentin and p53. (10)
- Treatment includes Bacille Calmette-Guerin for superficial malignancy and combination of radical cystectomy, chemotherapy, and radiation for invasive tumors. (1).
- Prognosis for osteosarcoma is poor in comparison to other differential diagnoses with demise typically occurring within 6 months (2).
- Local recurrence is common (45%), distant metastases are common (65%), with predominate metastases being pulmonary (81%) (5).
- Contributing factors to morality include continued local invasion, urinary obstruction, uremia, infection and pulmonary metastasis (1).
- Rare anecdotal cases report survival 36-51 months with combination of partial or radical cystectomy with chemotherapy (6).

Case

- A 72-year old African American man with a history of prostate cancer treated 12 years prior with external beam radiation and brachytherapy presented with hematuria. His PSA had been followed and found to be <0.01 without evidence of biochemical recurrence. Office cystoscopy revealed what was thought to be bladder calculi.
- Rigid cystoscopy revealed an obstructing calcified bladder mass that was resected.
- Pathology confirmed at the Cleveland Clinic revealed osteosarcoma of the bladder.
- Local recurrence after initial negative metastatic work up occurred 2 months after initial resection and additional transurethral resection was completed.
- The patient subsequently underwent radical cystoprostatectomy, ileal conduit, colon resection with colostomy due to adherent tumor to the rectum 3 months after initial resection.
- Pathology revealed osteosarcoma replacement to the prostate with extension into the bladder, and a single node positive for osteosarcoma.
- He experienced distant metastatic disease to liver and bone 3 months following the procedure despite adjuvant chemotherapy.
- His prognosis was deemed poor and he chose palliative care 10 months after initial resection.

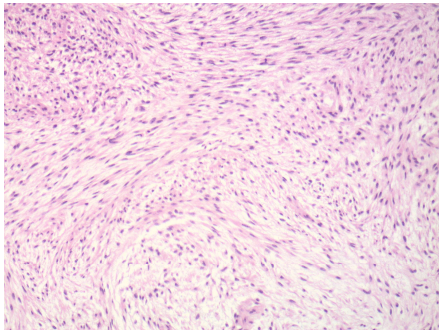

Figure 1. Portions of the tumor show atypical spindle shaped cells arranged in sweeping fascicles, similar to that seen in fibrosarcoma (H and E, original magnification 100X)

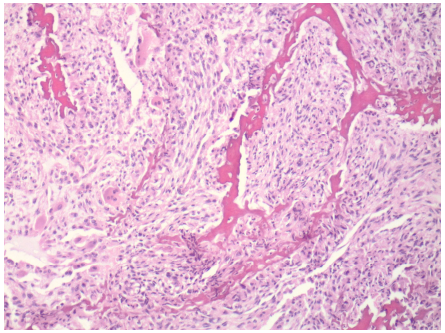

Figure 2. Other portions of the tumor show irregular osteoid formation intimately admixed amongst the atypical spindle shaped cells (H and E, original magnification 100X)

Discussion and Conclusion

- Our case demonstrates a rare sequela of radiation therapy. In addition, as our institution had yet to encounter this histological variant. Outside evaluation with a national cancer center was necessary to confirm the diagnosis. The patient received standard surgical and oncological care yet experienced rapid progression and demise.
- Osteosarcoma of the prostate and bladder is rare. In this case, the disease progressed despite surgical and oncological treatment.
- Prostate cancer is a common disease treated with radiation. Rare secondary malignancies resultant from prior radiation treatment reveal the long-term sequelae of radiation therapy. Our case highlights a need to counsel patients on long-term potential adverse effects of radiation therapy for prostate cancer.
- Proper diagnosis histologically is imperative when confronted with variant pathology. Osteosarcoma portends a worse prognosis when compared to differential diagnoses of sarcomatoid urothelial carcinoma and urothelial carcinoma with osseous metaplasia.
- A multi-center, multi-disciplinary approach to treatment of variant histology is essential for proper diagnosis and treatment.

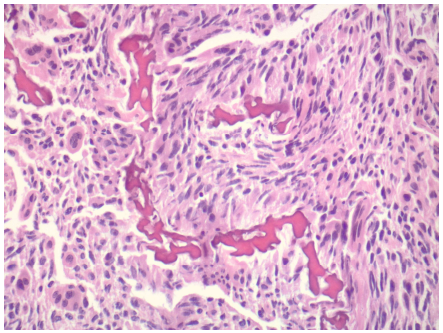

Figure 3. Higher power view of irregular osteoid within atypical cells, with associated osteoclast-like giant cells (H and E, original magnification 200X).

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