Treatment Emergent Small Cell Neuroendocrine Cancer of the Prostate: A Case Report

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Abstract

Prostate cancer (PCa) is the most diagnosed cancer in men in the United States and it is approximated that 1 out of 7 US men will be diagnosed with prostate cancer during their lifetime and nearly 2.8% of men will die from the disease.

It has been found that small cell carcinoma of the prostate occurs in patients with high-grade adenocarcinoma who are often treated with androgen deprivation treatment. [3]

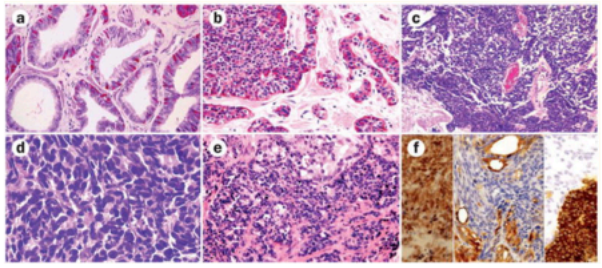
Our case describes a 74-year-old male with treatment emergent small cell neuroendocrine prostate cancer (t-SCNC). He was initially treated with neoadjuvant ADT and radiation, subsequently progressing to m-CRPC. We look at the diagnosis and treatment guidelines of t-SCNC in patients with m-CRPC.

This case highlights the importance of an interdisciplinary involvement and the identification and treatment associated with treating patients with t-SCNC.

Introduction

- The cellular signaling pathways of the prostate play a central role in the induction, maintenance, and progression of PCa
- Mutations include a frequent loss of P53 and/or RB1
- P53 mutation, likely a result of environmental pressure from hormonal therapy, inactivates this pathway seen in adenocarcinoma and leads to hyperproliferation and aggressive behavior of the NE cells, resulting in the development of SCNC.
- Found in 17% of patients with mCRPC
- Widespread use of abiraterone and enzalutamide has had a transformative impact in the management of advanced prostate cancer, yet therapeutic resistance is a near-universal phenomenon, frequently leading to a more aggressive clinical course
- It has been proposed that neuroendocrine cellular differentiation is accelerated by androgen deprivation treatment. [1]

Figure 1. Morphologic Spectrum of Prostatic Neuroendocrine Tumors[3]



Case

A 74-year-old male with a history of hemochromatosis and non-metastatic castrate resistant prostate cancer (nm-CRPC) presents to the emergency department with gross hematuria and clot retention.

His history is significant for T3bN0M0 intermediate-risk prostate cancer, Gleason 4+3, and PSA 4.4 at diagnosis. He was treated with radiation in 2014 and subsequently progressed to nm-CRPC treated with initial Eligard in 2017 and the addition of Erleada was added in 2018.

Patient underwent cystoscopy with clot evacuation and transurethral resection of prostate (TURP). Cystoscopy revealed trilobar hypertrophy of the prostate, severe trabeculation of the bladder, and a large number of clots within the bladder without evidence of tumors, masses, or calculi. Pathology revealed small cell carcinoma.

CT PET showed prostate cancer recurrence involving the posterior bladder wall and seminal vesicles, perirectal fat, as well as metastatic lymphadenopathy involving bilateral external iliac chains and common iliac chains extending proximally along the retroperitoneum to the level of the renal vessels. Patient was then started on chemotherapy and completed 4 cycles of carboplatin and etoposide.

A follow-up PET CT 7/23/20 demonstrated a favorable treatment response with near complete resolution of previously seen periprostatic extension and retroperitoneal/iliac chain lymphadenopathy as well as absence of new metastatic disease. Patient discussed at tumor board and will pursue immunotherapy given treatment response.

Figure 2. Pre-Treatment PET Scan

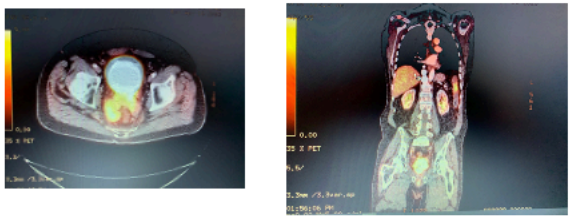
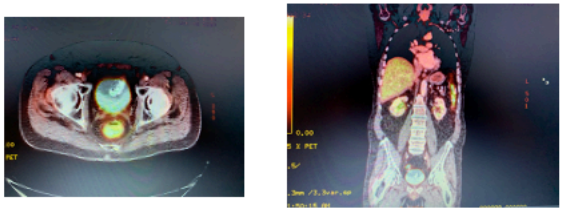


Figure 3. Post-Treatment PET Scan



Discussion and Conclusion

Small cell carcinoma of the prostate is a rare but aggressive form of prostate cancer. Much of its presentation leads to metastatic spread to the lung, brain, liver, or bone in the majority of patients with a mean survival of 19 months according to the Surveillance, Epidemiology, and End Results (SEER) database.[4]

It has been suggested that up to 17% of patients develop t-SCNC following treatment with continuous androgen deprivation therapy. This patient had recurrence of his prostate cancer and underwent ADT and subsequently developed treatment emergent small cell cancer.

Fludeoxyglucose-positron-emission tomography (FDG-PET) scans have been found to be useful in SCCP for initial staging and treatment- response evaluation.[5]

When SCCP is not diagnosed as a de novo primary prostate cancer, it usually reveals itself in the metastatic and castrate-resistant disease stage, when there is a progression of androgen-independent cancer that proves to be hormone therapy-resistant. Therefore, it becomes imperative to accurately detect patients with SCCP in a timely fashion, as they are unlikely to respond to subsequent androgen deprivation therapies (ADT) and carry an increased propensity for early metastasis.[5]

Given the increased chance of metastasis for SCCP, localized SCCP it is treated early with multimodal therapy consistent with Small Cell Lung Cancer (SCLC) guidelines combining chemotherapy with radiation.

This case emphasis the duty we have as physicians to ensure early detection of neuroendocrine differentiated prostate cancer and aggressive treatment. Cases, such as this, will provide information on an aggressive form of biochemical recurrence and lead to better suited treatment strategies moving forward in clinical practice.

References

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