A Rare Case of Prostate Cancer Metastasis to the Pineal Gland

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Case Presentation

- 75-year old man presented to the emergency department with altered mental status, dizziness and increasing generalized fatigue.
- Physical examination did not reveal any focal neurological deficits, but the patient did have an unsteady gait.
- PMHx: 2011: patient diagnosed with T1cN0M0, Gleason score 3+3, prostate cancer, originally treated with external beam radiation therapy.
- PSA remained high and patient was started on androgen deprivation therapy (ADT) but was not consistent.
- At the time of ED presentation, patient was on anti-androgen therapy and most recent PSA was 10.8.
- Hospital course: patient underwent third ventriculostomy and biopsy of lesion, which revealed metastatic prostate adenocarcinoma.
- Patient received a course of stereotactic radiosurgery to the lesion.

Diagnostics

A) CT of brain w/o contrast at time of admission demonstrating a solid, cystic, calcified pineal lesion, measuring approximately 1.9 x 1.8 x 2 cm (green arrow) B) MRI brain demonstrating pineal lesion with enhancing solid component measures 1.8 x 1.3 x 1.4 cm obstructing the central aqueduct, resulting in moderate hydrocephalus of the lateral and third ventricles.

C & D) Microscopic sections show a pineal gland lesion composed of a glandular pattern with areas of cribriform architecture. The glands are lined by cells with monotonous, hyperchromatic nuclei with abundant cytoplasm.

E & F) Immunohistochemistry of brain biopsy demonstrating diffuse positivity for PSA (E) and NKX3.1 (F).

Melatonin & Prostate Cancer

- Melatonin, the hormone produced by the pineal gland, has oncostatic effects on androgen-dependent prostate cancer and may induce differentiation.
- Melatonin production is reduced in elderly men with prostate cancer.
- Melatonin regulates the androgen receptor.
- Induces apoptosis in hormone sensitive prostate cancer and increases apoptotic effects of chemotherapy.
- Melatonin administered prior to LHRH analogue can help overcome resistance and palliate adverse effects.
- Pilot phase II studies in metastatic breast cancer increased tumor regression.

Discussion

- Based on the preclinical studies, melatonin may be an effective, safe adjuvant therapy for elderly prostate cancer patients to reduce time to CRPC.
- Current 19 active clinical trials studying effects of melatonin in cancer.
- With newer treatments and patients’ life expectancy increasing, more rare sites of metastases may occur.

Literature Search

- Second reported pineal gland metastasis in a living patient.
- Both patients had disease progression while on ADT indicating castration-resistant prostate cancer (CRPC).
- Both patients presented with pineal gland metastases about 2 years after the onset of bone metastases, while on androgen-deprivation therapy.
- Although initial biopsies revealed low-grade disease, patient developed metastatic castration-resistant prostate cancer.
- His pineal gland metastases demonstrated high-grade disease, inconsistent with primary prostate cancer.

References