Interesting Image
Mol Imaging Radionucl Ther 2023;32:54-56 DOI:10.4274/mirt.galenos.2021.55376

Metachronous Brain Tumor in 177Lu-PSMA Scan in a Patient with Metastatic Castration Resistant Prostate Cancer Mimicking Disease Progression

Metastatik Kastrasyon Dirençli Prostat Kanseri Olan Bir Hastada 177Lu-PSMA Görüntülemede Hastalık Progresyonunu Taklit Eden Metakron Beyin Tümörü

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Abstract

A 66-year old man known case of metastatic castration resistant prostate cancer underwent successful 6 cycles treatment with 177Lu- prostate-specific membrane antigen. On the last post therapy whole body scan a new lesion in the skull was noted, suspected for disease progression. One week later, the patient complained from weakness of left upper extremity and brain magnetic resonance imaging revealed a brain tumor, confirmed as glioblastoma pathologically.

Keywords: PSMA, mCRPC, glioblastoma, prostate cancer

Öz

Metastatik kastrasyona dirençli prostat kanseri olan 66 yaşında bir erkek hasta, 177Lu-prostata özgü membran antijeni ile 6 kürlük başarılı bir tedavi gördü. Son tedavi sonrası tüm vücut taramasında, hastanın kafatasında yeni bir lezyon görüldü ve hastalığın progresyonundan şüphelenildi. Bir hafta sonra hasta sol üst ekstremitede güçsüzlük şikayeti ile başvurdu. Beyin manyetik rezonans görüntülemede beyin tümörü saptandı ve patolojik olarak glioblastom olarak doğrulandı.

Anahtar kelimeler: PSMA, mCRPC, glioblastom, prostat kanseri

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Received: 28.06.2020 **Accepted:** 05.01.2021

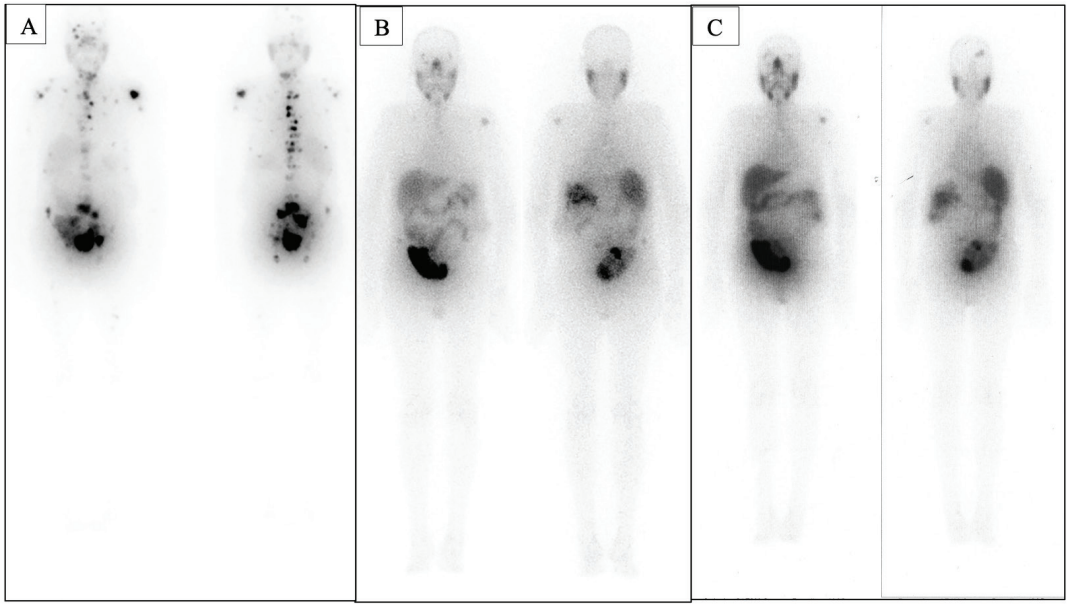

Figure 1. A 66-year-old man known case of transplanted kidney and prostate cancer (PC) (adenocarcinoma GS: 7/10) since 8 years ago received chemotherapy with docetaxel and different anti-androgen therapies including enzalutamide. Regarding the disease progression and serum prostate-specific antigen (PSA) rising, he was referred for radio ligand therapy with 177Lu- prostate-specific membrane antigen (PSMA).
At the time of the first examination, he had widespread skeletal metastases a PSA level of 139 mg/dL. He was an eligible candidate for radioligand therapy with 177Lu-PSMA, regarding the PSMA expression of the tumor, bone marrow reserve, renal function tests, and biochemical profiles.
He received 6 cycles of treatment (4 GBq in each cycle) with 2-3 months intervals and while the serial post therapies scans revealed gradual regression of metastases, a downward trend of PSA levels was noted throughout the entire course (139 ng/mL to 0.4 ng/mL), as well (1). (A) First and (B) 5th post therapy scan with 177Lu-PSMA. However, surprisingly on the 6th post therapy scan (C), a new lesion on the right side of the posterior skull was detected, suspected for new metastases and probable disease progression. Unfortunately, at the time of being aware of the comparison result of serial scans, the patient was not available anymore to obtain a single photon emission computed tomography study of the skull. One week later, the patient complained of progressive weakness of the left upper extremity and mild headache.

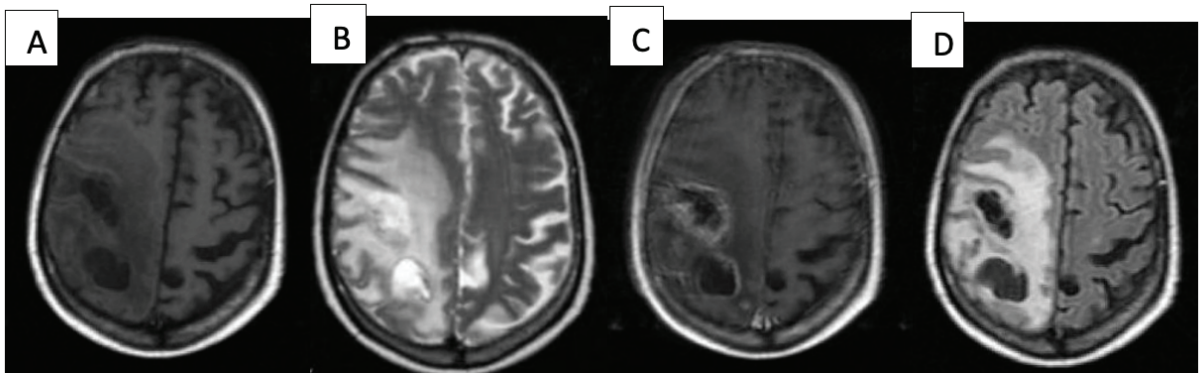

Figure 2. The patient underwent brain magnetic resonance imaging [(A) T1 weighted, (B) T2 weighted, (C) T1weighted with contrast, (D) fluid-attenuated inversion-recovery images] and it revealed a right frontoparietal necrotic mass with peripheral edema and incomplete ring enhancement with areas of patchy enhancement.

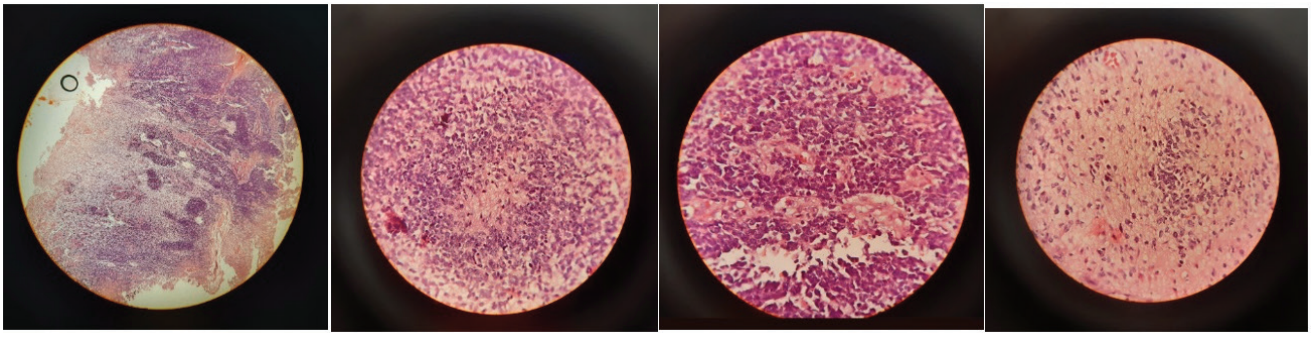

Figure 3. Stereotactic biopsy was performed and pathologic examination demonstrated a highly cellular and vascularized neoplasm with striking pleomorphism, composed of enlarged hyperchromatic nuclei and foci of palisading necrosis, compatible with glioblastoma multiforme (GBM).

Recent advances in the diagnosis and treatment of malignancies have resulted in improved survival of cancer patients, with increased chances of survivors being diagnosed with other primary malignancies. Multiple primary cancers (MPC), categorized as synchronous or metachronous, have an overall frequency of 2%-17% in the literature. MPCs have been reported in 1.14%-8.7% PC patients. The increased risk of some secondary tumors in PC, including bladder, colon, rectal, and urothelial cancers, could be related to radiation therapy. Some genetic factors (e.g. BRCA2) accounting for secondary primaries in PC have been recognized, as well, associated with pancreatic cancer or melanoma (2). Malignant brain tumors in PC patients is a very rare phenomenon, and no case has been found in case series studies (3,4). To our knowledge, it has been reported in a case report in the context of multiple neoplasms (5).

Since, GBM is one of the most vascularized tumors (6) and PSMA is overexpressed in the tumor vasculature of GBMs, PSMA-tracer uptake is seen in GBMs (7).

This case demonstrates a rare presentation of a metachronous brain glioblastoma in a PC patient. Additionally, it highlights the importance of careful interpretation of new PSMA-positive lesions in patients treating with 177Lu-PSMA.

Ethics

Informed Consent: The patient consent was obtained.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: E.P., M.T., Concept: E.P., M.T., Design: E.P., M.T., Data Collection or Processing: E.P., M.T., Analysis or Interpretation: E.P., M.T., Literature Search: E.P., M.T., Writing: E.P., M.T.

Conflict of Interest: No conflict of interest was declare by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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