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Peptide Receptor Radionuclide Therapy with ^{177}Lu-DOTATATE in a Case of Concurrent Neuroendocrine Tumors and Meningioma: Achieving Two Things in a Single Action

Eşzamanlı Nöroendokrin Tümör ve Menenjiyom Olgusunda ^{177}Lu-DOTATATE ile Peptid Reseptör Radyonüklid Tedavisi: Tek Bir Uygulama ile İki Hastalığın Tedavisi

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Abstract

We present a partial response of peptide receptor radionuclide therapy (PRRT) with ^{177}Lu-DOTATATE in a case of concurrent neuroendocrine tumors (NETs) and meningioma. In addition to the valuable role of PRRT in inoperable NETs, it has been demonstrated that this treatment can be a promising therapy for progressive meningioma, especially in patients with low grade and refractory to standard regime.

Keywords: ^{68}Ga-DOTATATE PET/MRI, PRRT, neuroendocrine tumor, ^{18}F-FDG-PET/CT

Öz

Bu olgu sunumunda eşzamanlı nöroendokrin tümör (NET) ve menenjiyom tanılı bir olgunun ^{177}Lu-DOTATATE ile peptid reseptör radyonüklid tedavisine (PRRT) kısmi yanıtı sunulmaktadır. İnoperabl NET'lerde PRRT'nin önemli rolüne ek olarak, bu tedavinin özellikle düşük dereceli ve standart rejime dirençli hastalarda ilerleyici menenjiyom için umut verici bir tedavi olabileceği gösterilmiştir.

Anahtar kelimeler: ^{68}Ga-DOTATATE PET/MRG, PRRT, nöroendokrin tümör, ^{18}F-FDG-PET/BT

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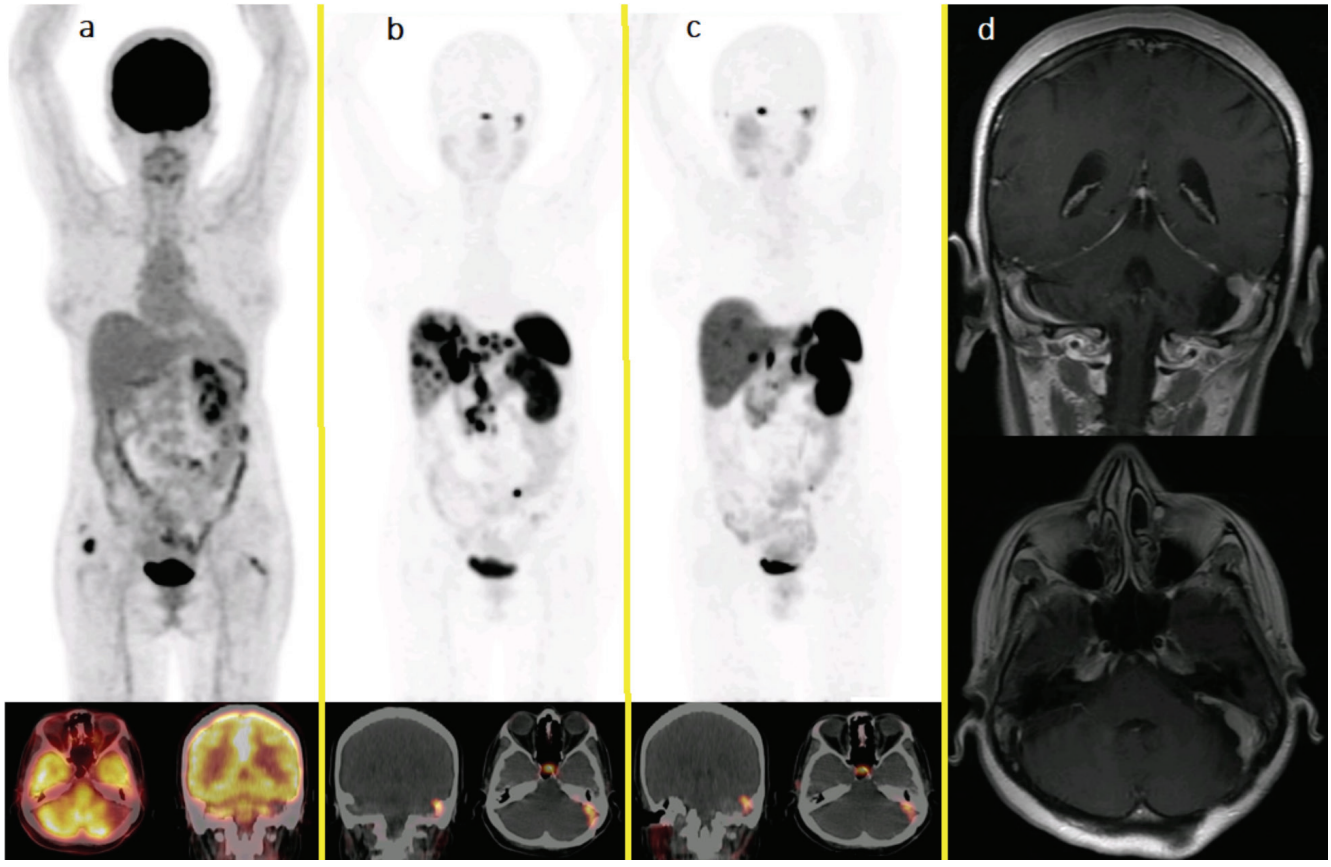

Figure 1. A 50-year-old female patient diagnosed as a case of metastatic neuroendocrine tumor (NET) with MiB1 index 5% and prior history of failure to several cycles of chemotherapy presented for probable peptide receptor radionuclide therapy (PRRT). (a) Pretreatment ^{18}flor-fluorodeoxyglucose (^{18}F-FDG) positron emission tomography/computed tomography (PET/CT) showed no ^{18}F-FDG uptake, while all lesions in the liver [maximum standardized uptake value (SUV_{max}): 26.26, size: 34 mm], around the inferior vena cava (IVC) in the right side (SUV_{max}: 20.03; size: 23 mm), the sacrum (SUV_{max}: 34.74), as well as a focus in the left side of vermis on pretreatment galium-68 (^{68}Ga)-DOTATATE PET/CT had significant expression of somatostatin receptor (SSTR), thus suggesting a good differentiation (b). The two hot foci in the pelvis observed on ^{18}F-FDG PET/CT were due to contamination. She showed a significant decrease in abdominal pain and frequency of diarrhea after two cycles of PRRT with ^{177}Lu-DOTATATE. (c) On follow-up ^{68}Ga-DOTATATE PET/CT, four months after the fourth cycle of PRRT, there was excellent partial response with residual viable disease in the liver (SUV_{max}: 12.23; size: 20 mm), large-sized IVC metastases (SUV_{max}: 4.51; size: 16 mm), and sacrum (SUV_{max}: 7.94). The patient also had meningioma grade I/III of WHO classification, which measures about 2.3x1.1x2.0 cm in the left side of vermis, thus suggesting a residual/remnant left posterior fossa meningioma. She had a prior history of surgery of this lesion (d). The SUV_{max} of such meningioma on ^{68}Ga-DOTATATE PET/CT before (b) and after PPRT (c) was 11.76 and 9.02, respectively, and no significant change in size on magnetic resonance imaging also represents a stable disease. This may be related to the point that functional imaging usually precedes anatomical imaging and may take longer time to occur on anatomical imaging. In addition to the approved role of PRRT in inoperable NETs, it has been demonstrated that this technique can be a promising therapy for progressive meningioma, especially in patients with low grade and refractory to standard regime (1,2,3). Molecular imaging of SSTR with ^{68}Ga-DOTATATE/-TOC in NET and meningioma can assist the implementation of targeted radionuclide therapy with lesion-based therapy concept in the aggressive/refractory subtype of such cancers (4,5).

Ethics

Informed Consent: Written informed consent of the patient was obtained from the patient.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: M.A., S.J.R., A.A., H.D., R.N., I.N., E.J., H.A., Concept: M.A., A.G., H.A., Design: M.A., E.J., Data Collection or Processing: M.A., E.J., H.D., Analysis or Interpretation: M.A., E.J., H.D., R.N., Literature Search: M.A., E.J., Writing: M.A., E.J., H.A.

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