**PET/MRI: A Promising Tool for Detecting Cardiac Neuroendocrine Tumor Metastasis**

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1. Abstract

Neuroendocrine Tumors (NET) staging, including metastasis detection, will affect the management and the prognosis of the disease. MRI imaging and somatostatin receptor [SSTR]-targeted PET appear complementary for metastasis detection with a higher sensitivity of PET for lymph node and lung metastases identification and a higher sensitivity of MRI for liver metastases detection. Regarding metastases to the myocardium, they are often missing with daily practice standard imaging. PET/CT has been described to be useful in assessing myocardial metastases. We present a 39-year-old male with a well-differentiated, small bowel NET resected, considered in complete remission and myocardial metastasis demonstrated on PET/MRI.

2. Case Report

A 39-year-old male with a well-differentiated, grade 2, Ki-67 3-20%, small bowel Neuroendocrine Tumor (NET) resected in 2015 presented for follow-up two years later. He had no carcinoid syndrome, pain, or palpable mass and had not lost weight (85 kg). Bloodpressure was 110/80 mm Hg and heart rate 75/min. Five months earlier, the last thoracic-abdominal and pelvic contrast-enhanced computed-tomography scan including arterial and venous portal phase acquisitions showed no signs of relapse. He was receiving no treatment and was considered in complete clinical and biological remission since the surgical treatment. Follow-up whole-body PET/MRI imaging was performed (Figure 1).

- Question: What is the diagnosis?
- Answer: Myocardial metastasis of neuroendocrine tumor. (Figure 1A) shows not only normal ¹⁸F-FDOPA uptake (basal ganglia, liver, pancreas, bile ducts, and urinary tract) but an abnormal focus in the chest (arrow) indicating an NET metastasis. The axial images through the heart demonstrate high ¹⁸F-FDOPA uptake (1B) by an 8-mm right anterior myocardial nodule on the ECG-gated Steady State Fast Processing sequence (1C), with an exact match on the fused image (1D).
may improve the sensitivity of extra-hepatic metastasis detection [6, 7].

To our knowledge, cardiac metastasis detection by PET/MRI has not been reported previously. The cardiac metastasis in our patient was found at a time when the standard evaluation indicated NET remission during post-surgical follow up period for which PET/MRI is under evaluation [8]. Thus, performing PET/MRI during follow-up for NET can modify the therapeutic management in a way likely to improve patient outcomes.

References


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