Control Number: 23

Abstract Category: Clinical Case Challenge in Cardio-Oncology

Title: A Multimodal Approach to Evaluate for Cardiac Metastasis in a Case of Non-Small Cell Lung Cancer

ABSTRACT BODY

Background and Purpose

Cardiac metastases have been found in up to 9.1 % of autopsies of patients with advanced cancer (1). There are no established guidelines for noninvasive diagnosis of cardiac metastasis.

Case Description and Outcomes

An 84-year-old male with mitral valve prolapse and mitral regurgitation, 40-pack-year smoking history, is diagnosed with biopsy-proven non-small cell lung cancer. An 18F-FDG PET-CT identified an FDG-avid left upper lobe mass, mediastinal adenopathy, and an intra-cardiac focus of FDG avidity suggestive of cardiac metastasis. Patient refused further evaluation with cardiac MRI (CMRI). Echocardiogram was inconclusive. He was started on immunotherapy with anti-PD-1 therapy (pembrolizumab), and after three cycles there was decreased FDG avidity on follow-up PET-CT at the primary site and resolution of intra-cardiac focus. Several months later, intra-cardiac avidity returned on PET-CT. The patient consented to CMRI at this point (10 months since diagnosis), which did not show the presence of a malignant mass.

Discussion

A multimodal approach that includes CMRI and PET-CT can be used when evaluating for cardiac metastasis. PET-CT alone lacks specificity; falsely-positive in infection, ischemia (2), atherosclerosis (3) and hypertrophy (4). Multimodal imaging allows for optimal evaluation of both response to treatment and potential pseudo-progression, which describes recurrent avidity on PET-CT due to immune cell infiltration of a tumor milieu that has been reported in patients with immunotherapy. Intra-cardiac FDG avidity does not necessarily indicate metastatic involvement. Pseudo-progression and false positives should be considered.

References

1. Goldberg AD, Blankstein R, Padera RF. Tumors metastatic to the heart. Circulation. 2013 Oct 15;128(16):1790-4.
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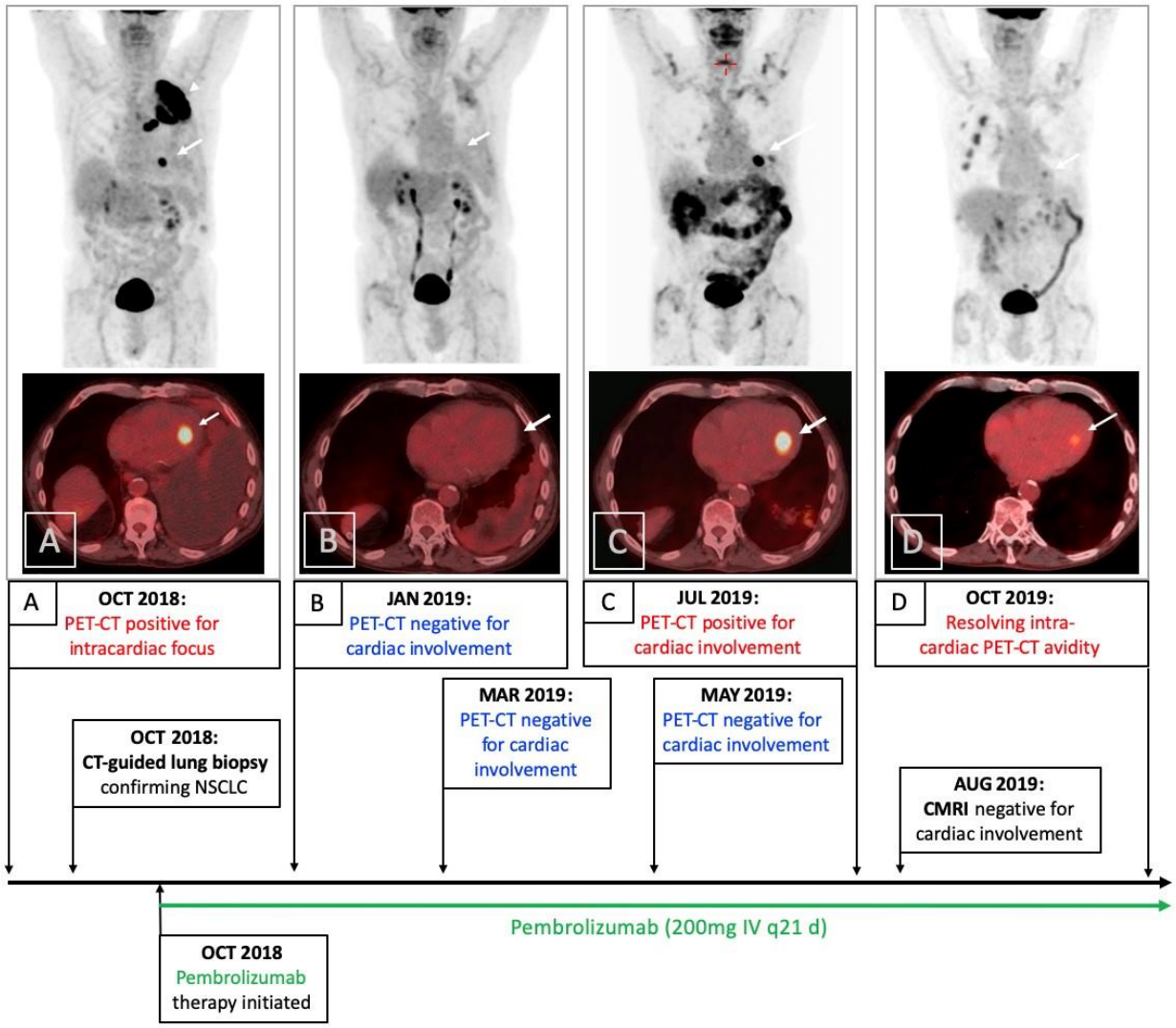
3. Carter KR, Kotlyarov E. Common causes of false positive F18 FDG PET/CT scans in oncology. Brazilian Archives of Biology and Technology. 2007 Sep;50(SPE):29-35.
4. Fathala A, Abouzied M, AlSugair AA. Cardiac and pericardial tumors: A potential application of positron emission tomography-magnetic resonance imaging. World journal of cardiology. 2017 Jul 26;9(7):600.

Image 1


A
B
C
D
A OCT 2018: PET-CT positive for intracardiac focus
B JAN 2019: PET-CT negative for cardiac involvement
C JUL 2019: PET-CT positive for cardiac involvement
D OCT 2019: Resolving intra-cardiac PET-CT avidity
OCT 2018: CT-guided lung biopsy confirming NSCLC
MAR 2019: PET-CT negative for cardiac involvement
MAY 2019: PET-CT negative for cardiac involvement
AUG 2019: CMRI negative for cardiac involvement
Pembrolizumab (200mg IV q21 d)
OCT 2018 Pembrolizumab therapy initiated