What lies beneath: A case of cardiac metastases presenting as pulmonary embolism.

Background: Metastases to the heart can have puzzling clinical presentation and require timely use of cardiac imaging for diagnosis. We present a unique case of cutaneous squamous cell carcinoma (cSCC) recurrence with distant metastases to the heart presenting as pulmonary embolism.

Methods: A 72-year-old white male with history of paroxysmal atrial fibrillation on apixaban, hypertension, cSCC of anterior chest wall post-surgical excision presented to the cardiology clinic with 3 weeks of shortness of breath. Echocardiogram in clinic demonstrated normal left ventricular function and a mass in the right ventricle (RV) that was concerning for thrombus (Figure A). He was admitted and started on heparin drip given the echocardiogram findings and concern for pulmonary embolism. An emergent CT scan of the chest demonstrated bilateral pulmonary emboli and confirmed the RV thrombus. He was discharged home on subcutaneous low molecular weight heparin given his recent cancer and evidence of thromboembolism while on apixaban. Two months later, a PET-CT scan done for surveillance of his cancer demonstrated intense uptake in RV anterior, free wall and hilar lymph nodes concerning for metastatic cancer (Figure C). A cardiac MRI for characterization of RV mass (Figure B) clearly demonstrated 2 masses(blue arrow) in the RV wall along with cavitary thrombus(red arrow). Hilar lymph node biopsy was consistent metastatic SCC and RV biopsy was therefore not pursued.

Results:
He was started on immunotherapy with cemiplimab. Six months after starting immunotherapy, his RV mass appeared smaller in size.

Conclusion: Cardiac metastases should be suspected in individuals with right ventricular thrombi and known history of malignancy. Multimodal imaging with PET-CT and cardiac MRI is essential for timely diagnosis.

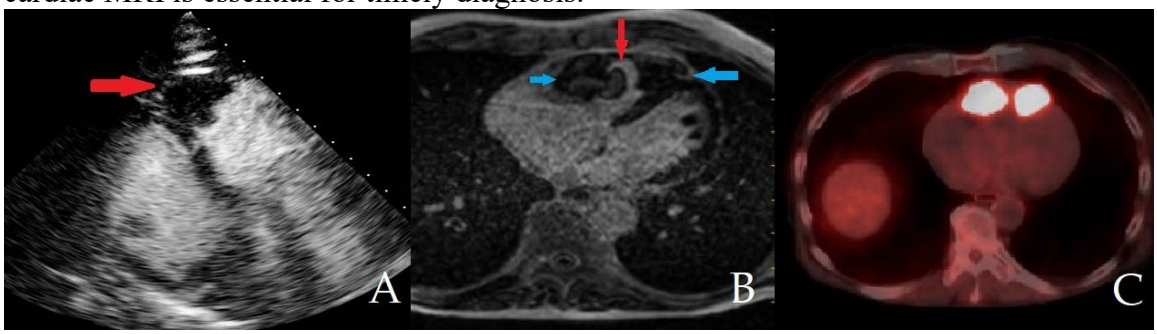

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Figure legend

1: Chronology chart of events prior to presentation
A timeline of patient's previous medical history before his presentation to the cardiology clinic with unexplained shortness of breath.

2. Right heart thrombus on echocardiography
Image of parasternal long axis of the RV anterior wall with contrast agent showing a non-enhancing mass in the anterior mid right ventricle suggestive of thrombus (red arrow).

3. Right heart thrombus on CTA of the chest
A) Computed tomography angiography (CTA) chest with contrast as viewed in coronal section demonstrates a filling defect in the lateral basal-mid right ventricle (red arrow).
B) Computed tomography angiography (CTA) chest with contrast as viewed in transverse section demonstrates a filling defect in the anterior mid right ventricle (red arrow).

4. Cardiac metastatic disease seen on PET scan
Two hypermetabolic foci within the heart corresponding to filling defects identified on previous chest CTA, incompatible with a bland thrombus and concerning for cardiac metastatic disease.

5. RV masses with thrombus on MRI
High resolution late gadolinium enhancement Magnetic Resonance Imaging (MRI) showing two enhancing masses at the anterior and lateral wall of the mid right ventricle (blue arrows), suspicious for metastatic disease. A non-enhancing mass seen in the adjacent basal-mid right ventricle is a thrombus (red arrow).