Clinical Images

Cardiac Metastases from Renal Cell Carcinoma

Aldo Barajas-Ochoa, MD¹ and Giselle A. Suero-Abreu, MD, PhD¹

Department of Medicine, Rutgers New Jersey Medical School, Newark, NJ, USA.

J Gen Intern Med 35(12):3711–2

DOI: 10.1007/s11606-020-06200-7

© Society of General Internal Medicine 2020

A 61-year-old man with clear cell renal cell carcinoma with multiorgan metastases treated with axitinib-pembrolizumab presented for follow-up. Restaging computed tomography (CT) with contrast showed disease progression to multiple organs, including new-onset cardiac metastases (Fig. 1). The patient reported no cardiac-related symptoms, although a transthoracic echocardiogram performed 1 month earlier had shown a pericardial effusion without cardiac metastases. Through shared decision-making, the patient opted to continue immunotherapy but died 1 month later secondary to complications of bowel perforation and brain metastases.

Cardiac metastases have an incidence of 0.7–3.5% in the general population (up to 9.1–18.3% in patients with known cancer) and are more frequent than primary cardiac tumors (incidence of 0.01–0.3%).^{1, 2} Most cardiac metastases originate from lung (36–39%), breast (10–12%), and hematologic malignancies (10–21%), which reflects the high prevalence of these malignancies in the general population.² Other malignancies that have a proclivity to involve the heart include melanomas (as high as 28–56% of cases), pleural mesotheliomas, and renal, ovarian, gastric, and pancreatic cancers.^{1, 2} Manifestations of cardiac metastases depend on their location and may include dyspnea, chest pain, pericardial effusion, arrhythmias, heart failure, and embolic phenomena.^{2, 3} However, most patients are asymptomatic, and most cardiac metastases are diagnosed post-mortem. Imaging studies such as echocardiography, CT, magnetic resonance imaging, and positron emission tomography are essential to diagnose and characterize cardiac metastases.^{2, 4} Management of cardiac metas-

Figure 1 Contrast-enhanced computed tomography images. Panel a shows multiple myocardial left ventricular metastases (black arrowheads), a moderate-size pericardial effusion (white arrowheads), and the primary right renal cell carcinoma (black arrows). Axial images highlight the extent of the cardiac metastases (black arrowheads) below the level of the main bronchus (panel b) and close to the cardiac apex (panel c, arterial phase), as well as the pericardial effusion (white arrowheads).

Received April 23, 2020

Accepted August 27, 2020

Published online September 9, 2020

tases is guided by the clinical presentation (e.g., cardiac tamponade or metastasis-induced arrhythmias). Since cardiac metastases often occur in patients with high metastatic burden, most treatments are systemic and palliative, with surgery reserved for the few cases where the prognosis is good.^{2, 4}

Corresponding Author: Aldo Barajas-Ochoa, MD; Department of Medicine, Rutgers New Jersey Medical School, Newark, NJ, USA (e-mail: aldouch5@gmail.com).

Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

REFERENCES

1. **Bussani R, De-Giorgio F, Abbate A, et al.** Cardiac metastases. *J Clin Pathol.* 2007;60:27-34. <https://doi.org/10.1136/jcp.2005.035105>.
2. **Goldberg AD, Blankstein R, Padera RF.** Tumors metastatic to the heart. *Circulation.* 2013;128:1790-1794.
3. **Stellato M, Cursano MC, Citarella F, et al.** Response to cabozantinib in renal cell carcinoma with cardiac metastases. *Anti-Cancer Drugs.* 2020. <https://doi.org/10.1097/CAD.0000000000000889>.
4. **Taguchi S.** Comprehensive review of the epidemiology and treatments for malignant adult cardiac tumors. *Gen Thorac Cardiovasc Surg.* 2018;66:257-262. <https://doi.org/10.1007/s11748-018-0912-3>.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.