Case Report

A Huge Right Ventricular Thrombus Clot in Renal Cell Carcinoma Without Inferior Vena Cava Involvement

Azin Alizadehasl[1], MD; Tahereh Saedi[2*], MD; Sedigheh Saedi[2], MD

ABSTRACT

Renal cell carcinoma (RCC) is a malignant tumor, a known sequel of which is metastasis to the heart via intraluminal venous extension (the inferior vena cava). However, tumor metastasis without inferior vena cava involvement is rare. Cardiac metastasis might necessitate surgical excision even in the very advanced stages of the disease. Here we describe a patient with RCC extension to the heart without evidence of a mass in the venous system. ***(Iranian Heart Journal 2021; 22(4): 156-158)***

KEYWORDS: Renal cell carcinoma, Cardiac thrombus, Metastasis

[1] Echocardiography Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, IR Iran.
[2] Rajaie Cardiovascular, Medical and Research Center, Iran University of Medical Sciences, Tehran, IR Iran.

***Corresponding Author:** Tahereh Saedi, MD; Rajaie Cardiovascular, Medical and Research Center, Iran University of Medical Sciences, Tehran, IR Iran.
Email: taherehsaedi80@gmail.com **Tel:** +982123921

Received: June 26, 2020 **Accepted:** July 27, 2020

Renal cell carcinoma (RCC) is an invasive cancer with a high metastatic rate. [1] RCC may infiltrate the renal vein, the inferior vena cava (IVC), and subsequently the right heart chambers as a tumor thrombosis. [1, 2] Cardiac extension could be asymptomatic or present with nonspecific symptoms including dyspnea, chest pain, arrhythmia, or even syncope. [3, 5] Very rarely, ventricular metastasis is found in the absence of the vena cava or right atrial (RA) involvement. [1-4] We herein describe a patient with a very large tumor clot in the right ventricle (RV) without IVC or RA involvement detected by echocardiography.

Case Report

A 77-year-old man with a history of RCC, left nephrectomy, and hepatic metastasis was hospitalized for dyspnea and acute deep vein thrombosis. Transthoracic echocardiography revealed a normal left ventricular size, a normal left ventricular ejection fraction, a mildly dilated RV with mild systolic dysfunction, and a large (5.5×1.8 cm), nonhomogeneous fixed mass with an irregular shape expanding from the RV apex to the mid-RV cavity. There was no pericardial effusion. No clot or mass was detected in the IVC or the pulmonary artery branches. The estimated systolic pulmonary arterial pressure was about 45 mm Hg (Fig. 1). In pulmonary computed tomography (CT) angiography, the right and left pulmonary arteries, as well as the hilar and intraparenchymal branches, were normal without evidence of intraluminal filling defects or thromboembolism. In the RV, a large filling defect measuring 56×30 mm was visualized (Fig. 2). Due to the presence of concomitant deep vein

thrombosis, the most likely diagnosis seemed to be an RV tumor clot. The patient refused surgery; and considering the advanced nature of the underlying malignancy, he was discharged to palliative care with oral anticoagulation and recommendations for close clinical follow-ups.

Figure 1. The transthoracic 4-chamber (A) parasternal long axis (B) and short-axis (c) echocardiography views depict a large RV mass (arrow).

LV, Left ventricle; RV, Right ventricle

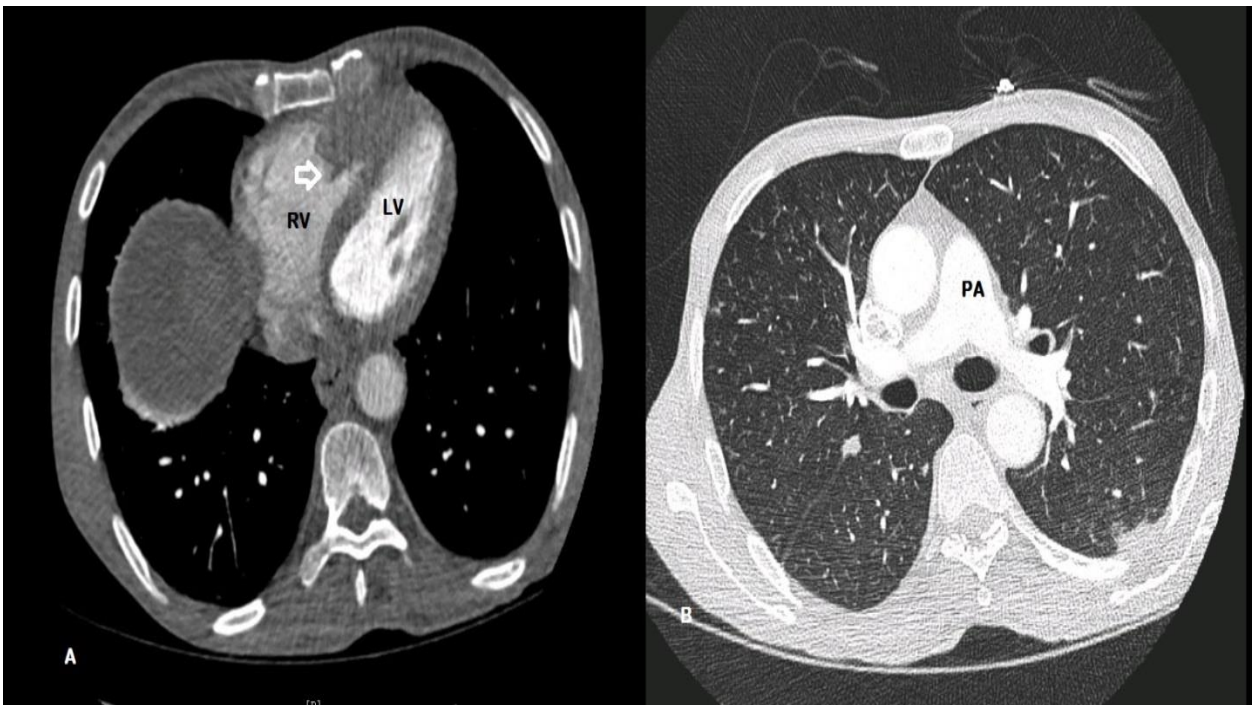

Figure 2. The axial computed tomography angiographic images show an RV mass (A, arrow) and no evidence of pulmonary emboli (B).

LV, Left ventricle; RV, Right ventricle; PA, Pulmonary artery

DISCUSSION

Left-sided cardiac tumors usually come to attention during evaluation for systemic emboli by echocardiography. Right-sided cardiac masses are often diagnosed during workup for dyspnea or pulmonary arterial emboli. [1-3]

Metastatic tumors of the heart are much more common than primary tumors. [1] Metastatic tumors could reach the cardiovascular system via multiple pathways. RCC is a malignant tumor with a high prevalence of propagation to the heart by way of intraluminal venous extension (the IVC). [1, 2]

With considerable improvements in the treatment of malignancies nowadays, patients with various cancers form a large population prone to thrombotic events and tumor metastasis complications. Therefore, routine cardio-oncology visits and echocardiographic follow-ups to monitor for drug-associated cardiotoxicity, as well as metastatic and embolic complications, are recommended. [1, 3]

RCC is generally unresponsive to chemotherapy or radiotherapy, and high-risk surgery might be required even in patients with advanced disease. [4, 5] This could be a challenge as cardiac mass removal requires a complex cardiac surgical operation. [6-8] There are reports of nephrectomy and the surgical excision of the right cardiac chamber mass; however, the operation is demanding and the use of extracorporeal cardiopulmonary bypass is necessary. Performing surgery on a patient with end-stage cancer is also controversial. [4, 8] Consulting the heart team and discussing viable options with the patient and the family could help individualize the clinical decision-making.

REFERENCES

1. Grazia Casavecchia1, Chiara Lestuzzi2, Matteo Gravina3, Giovanni Corrado4, Maurizio Tusa5, Natale D Brunetti1, Vincenzo Manuppelli1, Ines Paola Monte. Cardiac tumors. J Cardiovasc Echogr. 2020 Apr; 30 (Suppl 1): S45–S53

2. Noguchi K, Hori D, Nomura Y, Tanaka H. Renal cell carcinoma with tumor–thrombus extension into the right ventricle. Annals of vascular diseases. 2012; 5(3):376-80

3. J H Goldman 1, E Foster. Transesophageal Echocardiographic (TEE) Evaluation of Intracardiac and Pericardial Masses. 2000 Nov; 18(4):849-60.

4. Libertino JA, Wotkowicz C, Gee JR. Surgery for Renal Cell Carcinoma with Thrombus Extension into the Vena Cava. InRenal Cancer 2020 (pp. 259-280). Springer, Cham.

5. Saedi S, Oraii S, Hajsheikholeslami F. A cross sectional study on prevalence and etiology of syncopee in Tehran. Acta Med Iran. 2013; 51(10):715-9.

6. Khorgami, MR, Moradian, M, Omidi, N, et al. Management of cardiovascular disorders in patients with Noonan Syndrome: a case report. J Tehran Heart Cent 2017; 12: 184–187.

7. Anita Sadeghpour, Azin Alizadehasl. The Right Ventricle: A Comprehensive Review From Anatomy, Physiology, and Mechanics to Hemodynamic, Functional, and Imaging Evaluation. February 2016, Archives of Cardiovascular Imaging. DOI:10.5812/acvi.35717

8. Malone MA, Ares GR, De Velasco G, Brandão R, Lin X, Norton C, Simantov R, Moslehi J, Krajewski KM, Choueiri TK, McKay RR. The clinical presentation, survival outcomes, and management of patients with renal cell carcinoma and cardiac metastasis without inferior vena cava involvement: results from a pooled clinical trial database and systematic review of reported cases. Clinical genitourinary cancer. 2018 Apr 1; 16(2):e327-33.