

Images in  
Cardiovascular Disease



# Renal Cell Carcinoma With Metastasis to Right Ventricle Without Inferior Vena Cava Involvement

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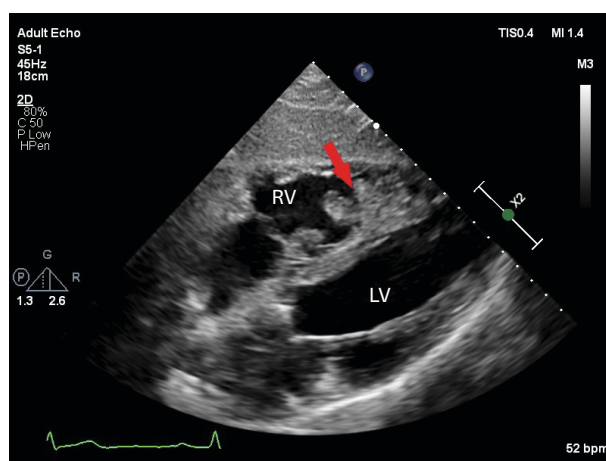
**Conflict of Interest**

The authors have no financial conflicts of  
interest.

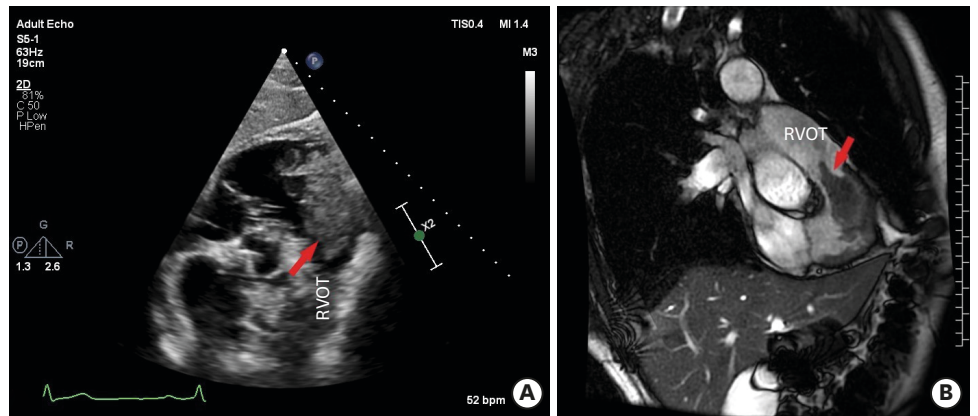
**Author Contributions**

Conceptualization: Baibhav B; Investigation:  
Buttar R; Methodology: Buttar R, Baibhav B;  
Resources: Buttar R, Baibhav B; Supervision:  
Baibhav B; Visualization: Buttar R, Baibhav  
B; Writing - original draft: Buttar R; Writing -  
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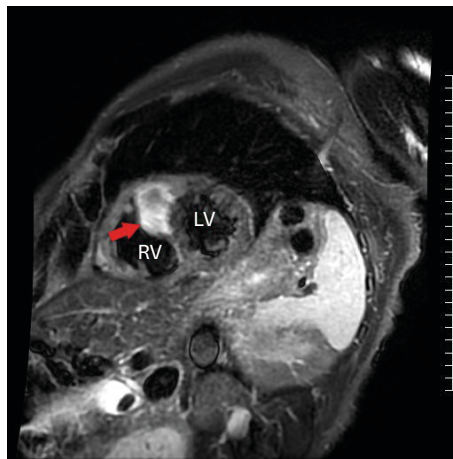
A 68-year-old male with past medical history of metastatic sarcomatoid renal cell carcinoma (RCC), pulmonary embolism on anticoagulation presented for evaluation of right ventricular (RV) mass. A computed tomography scan of chest for evaluation of metastatic RCC showed a filling defect in the RV. Patient was referred to cardiology for further evaluation of the intracardiac mass. Electrocardiogram showed sinus bradycardia with first degree heart block. Transthoracic echocardiogram showed an echogenic mass in the RV measuring 5.9 cm×2.9 cm (**Figure 1** and **Movie 1**). Cardiac magnetic resonance for further evaluation showed a 5.0 cm×4.8 cm mass in the RV attached to the RV apex and septal wall. The mass was noted to have irregular, ill-defined borders (**Movie 2**). A portion of the mass was noted to prolapse from the RV outflow tract into the pulmonary artery as seen in **Figure 2** and **Movie 3**. The mass was hyper-intense on T2-weighted images (**Figure 3**) and had elevated native T1 value on parametric mapping (**Figure 4**). On T2 map the T2 value was elevated at 72 msec. Post contrast late gadolinium enhancement images of the RV mass showed patchy fibrosis. No involvement of the inferior vena cava (IVC) was seen. Extension of the RCC into the IVC can be seen in 5–15% of the cases.<sup>1</sup> However, cardiac metastasis from RCC is extremely rare with only 1% of all RCC tumors involving the right atrium.<sup>2</sup> Even more uncommon is metastasis to RV without IVC involvement as seen in our case.



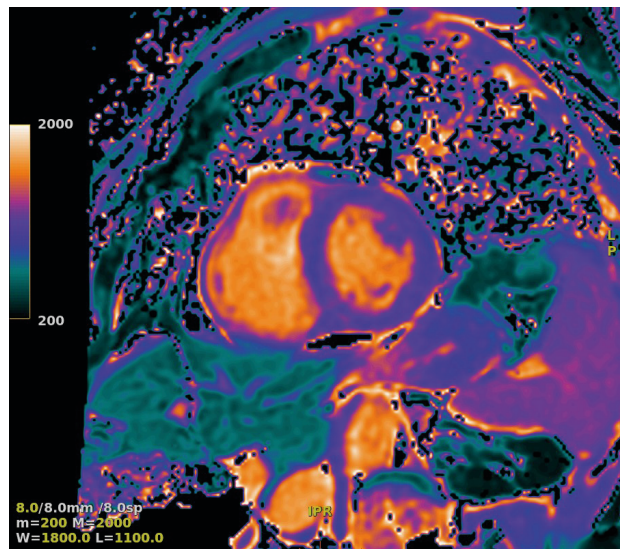
**Figure 1.** Subcostal view on transthoracic echocardiogram showed an irregular shaped echogenic mass (red arrow) in the RV attached to the right ventricular apex and septal wall. LV: left ventricle, RV: right ventricle.



**Figure 2.** (A) Subcostal short axis view on transthoracic echocardiogram showed the right ventricular mass prolapsing into pulmonary artery during systole. (B) T1-weighted images showed that the mass is isointense (red arrow). RVOT: right ventricular outflow tract.



**Figure 3.** T2-weighted images of the mass (red arrow) demonstrating hyperintensity consistent with edema or inflammation. LV: left ventricle, RV: right ventricle.



**Figure 4.** On parametric mapping, the mass is noted to have elevated native T1 values.

## SUPPLEMENTARY MATERIALS

### Movie 1

Subcostal transthoracic echocardiogram cine images showed irregular, echogenic mobile mass in the right ventricle.

[Click here to view](#)

### Movie 2

Steady-state free procession 4 chamber view demonstrating irregular shaped mass with ill-defined borders attached to the right ventricular apex and septal wall.

[Click here to view](#)

### Movie 3

Steady-state free procession view of the right ventricle inflow and outflow demonstrating irregularly shaped mass with mobile and nonmobile components. Part of the mass prolapses from the right ventricular outflow tract into the pulmonary artery during systole.

[Click here to view](#)

## REFERENCES

1. Oltean MA, Matuz R, Sitar-Taut A, et al. Renal cell carcinoma with extensive tumor thrombus into the inferior vena cava and right atrium in a 70-year-old man. *Am J Men Health* 2019;13:1557988319846404. [PUBMED](#) | [CROSSREF](#)
2. Briosa E Gala A, Dimarco A, Adam R, Haydock P, Flett A. Subtotal obstruction of the right ventricular outflow tract caused by isolated intracardiac renal cell carcinoma metastasis. *Circ Cardiovasc Imaging* 2019;12:e009714. [PUBMED](#) | [CROSSREF](#)