Renal Cell Carcinoma Presenting With Combined Cervical Lymphadenopathy and Cardiac Metastasis Without Inferior Vena Cava Involvement

Rana M. Usman, MD; Owais Yahya, MD; Hemnishil K. Marella, DO; Amit L. Jain, MD; Rahul Peravali, BS; Reshma Premkumar; Robert Bradsher, MD

ABSTRACT

Renal cell cancer is the third most common urological malignancy following prostate and bladder malignancies. Cardiac metastases to the right side of the heart without inferior vena cava (IVC) involvement are exceedingly rare, with only a handful of cases described in the literature. Metastasis to the head and neck region is also rare, occurring in an estimated 1% of cases. Here we present a case of a patient with recurrent syncopal events secondary to renal cell carcinoma without IVC involvement, with metastases both to the right ventricle and cervical lymph nodes. To our knowledge, this is the first case that presents with both of these rare findings together and that highlights cancer screening in patients with high risk factors and new exam findings in patients with syncopal events having negative initial workup.

INTRODUCTION

Renal cell cancer (RCC) is the third most common urological malignancy following prostate and bladder malignancies.[1] The 5-year survival rate for RCC is 75% overall, which decreases to 12% among patients with distant metastatic disease.[2] The most common sites of RCC metastasis include the lung, liver, soft tissues, bones, and central nervous system; rarer sites of metastasis include the heart and the head and neck region.[3] The most common pattern of RCC spread to the heart is through inferior vena cava (IVC) involvement, which can occur in 5% to 15% of the cases.[3] Cardiac metastasis in the absence of vena cava involvement is exceptionally rare, with only a few cases reported in the literature. Metastasis to the head and neck region also is rare, occurring in an estimated 1% of cases.[4] Here we present a case with 2 extremely rare metastatic sites of RCC: cardiac metastasis without IVC involvement and metastasis to the head and neck region.

• • •

Author Affiliations: Department of Internal Medicine, The University of Tennessee Health Science Center, Memphis, Tennessee (Usman, Yahya, Marella, Jain, Peravali, Premkumar, Bradsher)

Corresponding Author: Rana M. Usman, MD, The University of Tennessee Health Science Center, 956 Court Ave, Suite H314, Memphis, TN 38163; phone 917.754.3314; email rusman@uthsc.edu; ORCID ID 0000-0003-0062-1811.

CASE REPORT

A 61-year-old man with a past medical history of hypertension and schizophrenia with medicine nonadherence was brought to the hospital by family after an episode of syncope. The family reported that he had been having progressive left-sided neck swelling for the past 3 months, along with enlarging masses on his buttocks and left axilla. On initial presentation, he denied any complaints of pain and was adamant about going home only. His family also denied any previous syncope episodes. The patient had previously refused to seek medical care, but his family was able to convince him to come to the hospital after his syncopal episode. He had a 40 pack-year smoking history with no history of alcohol use or illicit drug use. His family denied any history of cancers in the family before. They also indicated he was getting intramuscular injections for his schizophrenia, but they were unsure about his compliance to all of his medications. After discussion with the family, he was admitted and workup was started.

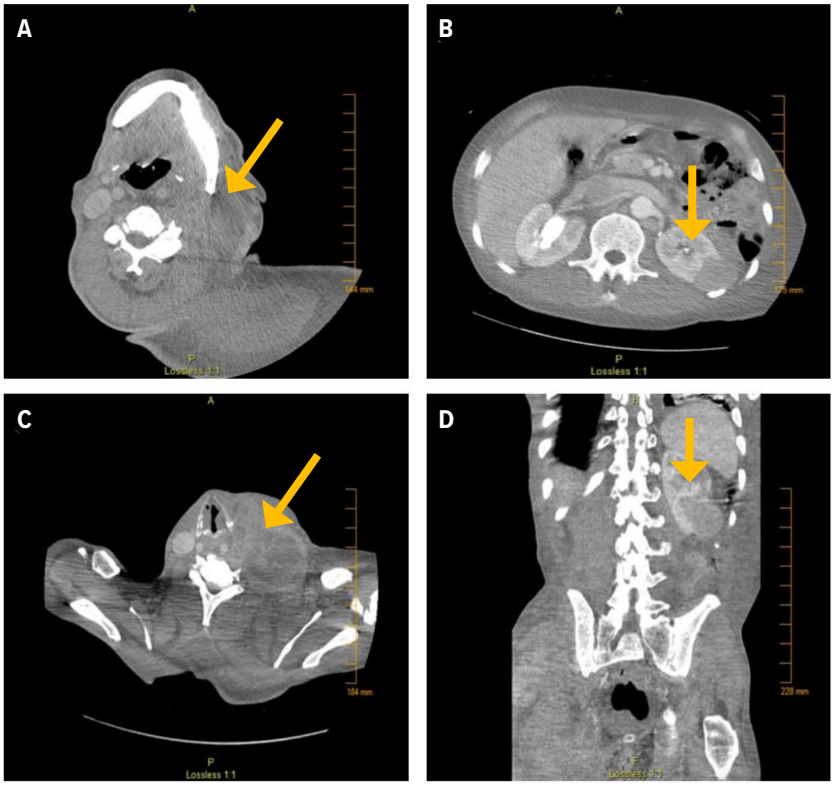
The patient's vital signs on initial presentation were as follows: blood pressure 128/96, pulse rate 92/min, respiratory rate 18/min, and temperature 36.9° C. On physical exam, he had a disheveled and cachectic appearance. He had a hard left-sided neck mass measuring 3x3 cm (Figure 1A), along with palpable diffuse left-sided axillary lymphadenopathy. Another nodular large mass measuring 11x8 cm was noted on the right lower back, about 6 cm lateral to the gluteal cleft, which was biopsied to have initial diagnosis. He also had left upper extremity swelling and erythema. The rest of his examination was unremarkable. Initially, it was sus-

pected that he had either lymphoma with distant metastases or a primary abdominal tumor with distant metastases and lymphadenopathy.

Initial electrocardiogram on presentation showed sinus rhythm with left axis deviation, without any evidence of atrioventricular blocks or bundle branch blocks. To rule out intracranial cause for syncope, computed tomography (CT) head was done and was negative for any acute findings. A left upper extremity ultrasound was significant for a nonocclusive thrombus involving the left axillary and high left brachial veins. CT with contrast of the neck revealed bulky left cervical lymphadenopathy measuring 5.4 x 6.1 cm and extending to the base of the neck, supraclavicular, axillary, and superior mediastinal regions (Figure 1C). Left axillary conglomerate lymphadenopathy measuring 9.5 x 6.0 cm was also noted. CT thorax identified a filling defect in the right ventricle extending to the apex measuring 6cm, a finding suspicious for malignancy. A mass effect on the left internal jugular vein resulted in partial occlusion. CT abdomen and pelvis was significant for multiple renal masses on the lateral aspect of the left kidney involving all poles (Figure 1B, 1D). Several of these lesions were cystic, while others were exophytic solid masses. Diffuse confluent pelvic adenopathy and massive inguinal lymphadenopathy were reported as well. Transthoracic echocardiogram was performed to further characterize the cardiac mass. A large mass measuring 4.8 cm x 3 cm extended from the apex to the mid-right ventricular cavity and right ventricular outflow tract (Figure 2). The deformation of the right ventricular free wall suggested malignant growth rather than a thrombus.

The patient's initial presentation of syncope was likely secondary to a combination of his intracardiac mass and left internal jugular occlusion leading to decreased venous return to the heart and a subsequent drop in cardiac output. CT-guided core biopsy was done from his lower back (gluteal mass), which came back as metastatic poorly differentiated carcinoma of likely renal origin. On immunohistochemistry, tumor cells expressed pancytokeratin, PAX-8, and vimentin and were negative for S-100, Melan-A, and RCC. Immunohistochemistry favored metastatic carcinoma of renal origin with a possibility of unclassified RCC. PAX-8 is a very useful marker for Mullerian carcinomas, whereas vimen-

Figure 1. Computed Tomography (CT) of Head, Neck, Abdomen, and Pelvis.



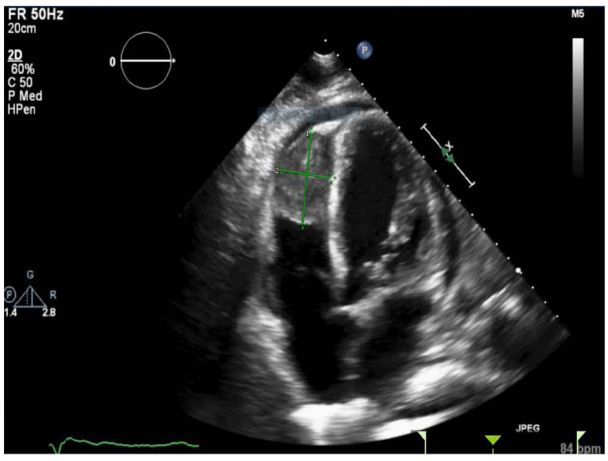
1A. CT neck. Arrow indicates 3 x 3 cm mass.

1B. CT abdomen and pelvis with contrast. Arrow indicates left renal mass.

1C. CT with contrast of the neck. Arrows indicates 5.4 x 6.1 cm bulky left cervical lymphadenopathy extending to base of the neck and supraclavicular, axillary, and superior mediastinal regions.

1D. CT abdomen and pelvis. Arrow indicates multiple renal masses on lateral aspect of left kidney involving all poles.

Figure 2. Echocardiogram: Transthoracic (TTE)



Cardiac mass 4.8 cm x 3 cm in the right ventricle.

tin helps distinguish RCC mimics. Due to unsure status of the patient about medical decision-making, his case was discussed with his family throughout the hospitalization and, after discussion with family, he was discharged with family care. Follow-up with oncology was arranged to discuss further workup and treatment options, but the patient did not follow up after discharge.

DISCUSSION

Metastatic disease of the heart is much more common than primary heart tumors. Cardiac tumors are often asymptomatic, but some can present with symptoms such as palpitations and syncope.[5] Metastasis from primary cancers to the heart can occur through 3 mechanisms: (1) hematogenous spread with and without IVC involvement, (2) direct spread from the IVC, and (3) intrathoracic lymphatic spread.[6,7] The most common pattern of RCC spread to the heart is through IVC involvement, which can occur in 5% to 15% of cases.[3] This mechanism of spread typically involves the right atrium. Cardiac metastasis without IVC tumor burden is rare. When IVC involvement is not present, RCC can spread to the heart hematogenously via the renal vein or through intrathoracic lymphatic spread. Hematogenous spread from the renal vein most commonly involves the right side of the heart, while lymphatic spread most commonly involves the left side of the heart.[8]

Our patient likely had hematogenous spread to the right side of the heart via the renal vein without IVC tumor burden, which became the reason for his presentation to the hospital with syncope. Moreover, he likely had lymphatic spread to the lymph nodes of the head and neck. Metastasis to the head and neck region is extremely rare and is estimated to be present in less than 1% of RCC cases.[4] Patients with solitary metastasis to the heart generally do well with surgical resection of the lesion.[9] However, because our patient had multiple sites of disease, along with bulky lymphadenopathy, he was not a candidate for surgical resection. He was referred to outpatient oncology for evaluation for palliative chemotherapy.

CONCLUSION

To our knowledge, this is the first case that presents RCC metastases to both the cervical lymph nodes and the right ventricle without IVC involvement—2 individually rare findings in 1 patient. Our patient presented with syncope, which can be related to his cardiac metastatis from RCC, as no other apparent cause of syncope was identified in his case. However, this may not occur in every case. Careful history should be taken with great detail, history of personal or family malignancies should be reviewed, and detailed physical examination and syncopal workup should be done to rule out other causes of syncope.

Funding/Support: None declared.

Financial Disclosures: None declared.

REFERENCES

1. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2020. *CA Cancer J Clin.* 2020;70(1):7-30. doi:10.3322/caac.21590

2. Cairns P. Renal cell carcinoma. *Cancer Biomark*. 2010;9(1-6):461-473. doi:10.3233/CBM-2011-0176

3. Sountoulides P, Metaxa L, Cindolo L. Atypical presentations and rare metastatic sites of renal cell carcinoma: a review of case reports. *J Med Case Rep*. 2011;5:429. doi:10.1186/1752-1947-5-429

4. Pritchyk KM, Schiff BA, Newkirk KA, Krowiak E, Deeb ZE. Metastatic renal cell carcinoma to the head and neck. *Laryngoscope*. 2002;112(9):1598-1602. doi:10.1097/00005537-200209000-00012

5. Alghamdi A, Tam J. Cardiac metastasis from a renal cell carcinoma. *Can J Cardiol. 2006;22(14):1231-1232. doi:10.1016/s0828-282x(06)70964-3*

6. Zustovich F, Gottardo F, De Zorzi L, et al. Cardiac metastasis from renal cell carcinoma without inferior vena involvement: a review of the literature based on a case report. Two different patterns of spread? *Int J Clin Oncol.* 2008;13(3):271-274. doi:10.1007/s10147-007-0730-6

7. Sahin S, Karatas F, Hacioglu MB, Aytekin A, Cilbir E, Conkbayir I. Renal cell carcinoma presenting with heart metastasis without inferior vena caval and right atrial involvement. *J Cancer Res Ther.* 2018;14(2):457-458. doi:10.4103/0973-1482.193111

8. Atik FA, Navia JL, Krishnamurthi V, et al. Solitary massive right ventricular metastasis of renal cell carcinoma without inferior vena cava or right atrium involvement. *J Card Surg.* 2006;21(3):304-306. doi:10.1111/j.1540-8191.2006.00244.x

9. Aburto J, Bruckner BA, Blackmon SH, Beyer EA, Reardon MJ. Renal cell carcinoma, metastatic to the left ventricle. *Tex Heart Inst J.* 2009;36(1):48-49.

advancing the art & science of medicine in the midwest

WMJ

WMJ (ISSN 1098-1861) is published through a collaboration between The Medical College of Wisconsin and The University of Wisconsin School of Medicine and Public Health. The mission of *WMJ* is to provide an opportunity to publish original research, case reports, review articles, and essays about current medical and public health issues.

Visit www.wmjonline.org to learn more.