Embolic Stroke in a Patient with Metastatic Renal Cell Cancer

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Echocardiography has had a positive impact on the timely diagnosis of patients with cardiac tumors, which potentially can affect management. However, the American Heart Association guidelines suggest that in the evaluation of an embolic event, intracardiac masses should be suspected and appropriately pursued with echocardiography based on the clinical index of suspicion.1 Notably, the current Echocardiography Appropriateness guidelines are uncertain as to the value of transesophageal echocardiography in the setting of cerebrovascular symptoms, in the setting of a normal transthoracic echocardiogram. 2 However, the literature demonstrates that a potential cardiac etiology can be identified in a portion of patients with embolic stroke.3 We present an unusual cause of embolism of cardiac source—a metastatic renal cell carcinoma invading the pulmonary veins—which has not previously been described as a source of tumor embolism and stroke.

A 54-year-old man with past medical history of hypertension, hyperlipidemia, and bilateral renal cell carcinoma complained of new-onset speech difficulties. He had a history of complete resection of renal cell carcinoma with a right radical nephrectomy and partial left nephrectomy with negative margins six months prior to admission. The electrocardiogram showed sinus rhythm, with no other significant abnormalities. Magnetic resonance imaging of the brain noted acute infarctions in the bilateral frontal lobes, left anterior insula and left inferior basal ganglia region, suggestive of an embolic etiology. Transesophageal echocardiography (TEE) was performed to elucidate the source of embolic stroke and demonstrated a large, mobile echodense mass attached to the right atrial free wall (Figure 1), originating from the inferior vena cava (Figure 2), most consistent with a tumor probably originating from the renal vein. In addition, a mobile echodense mass was noted originating from the right lower pulmonary vein, extending into the left atrium (Figure 3), identified by TEE and confirmed by chest computed tomography as metastatic disease extending from the lungs into the pulmonary veins (Figure 4). In addition, a small secundum atrial septal defect was also noted (not shown). The patient was referred for resection of cardiac masses, inferior vena cava mass (Figure 5), and closure of atrial septal defect. The pathology was consistent with renal cell carcinoma. The patient’s short term outcome was favorable.

This case demonstrates an unusual cardiac source of embolism, with metastatic renal cell carcinoma invading the pulmonary veins as the most likely etiology of this patient’s stroke. This source of tumor embolism has not previously been described as an etiology of embolic stroke. Tumor embolism is a well recognized phenomenon, in which left atrial and aortic
Figure 1. Transesophageal bivacal view demonstrating right atrial mass (RA, solid arrow) and left atrial mass (LA, dashed arrow).

Figure 2. Transthoracic subcostal view demonstrating a mass invading the heart through the inferior vena cava (IVC).

Figure 3. Transesophageal echocardiography showing a mass invading the heart through the right lower pulmonary vein (RLPV).

Figure 4. Computed tomography demonstrating metastatic disease invading the heart through the right lower pulmonary vein (arrow).
valve tumors have the highest risk of embolic potential. Evaluation of patients with echocardiography is recommended in patients who present with a recent systemic ischemic event that has no obvious source. According to a large case series, surgical resection in the context of a recent embolic event appears to be safe, with good short- and long-term outcomes in all patients except those with malignant cardiac tumors.

References

Figure 5. Intraoperative findings of a right atrial mass (arrow).