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Venacavo-Atrial Renal Tumor

N. Shaikh[1], S. Kundu[1], R. M. Gowda[2], S. K. Daya[3], I. A. Khan[4]

Key words: renal cell carcinoma, cardiac tumor, cardiac metastasis, inferior vena cava tumor, echocardiography

A 58-year-old man was hospitalized for progressively worsening dizziness precipitated by change of posture from recumbence to upright posture. In addition, he complained of exertional dyspnoea, increasing weakness, easy fatigability, and an unintentional weight loss of 10 pounds over the preceding few weeks. He had a 40-pack year history of smoking.

Physical examination revealed a blood pressure of 142/88 mmHg and pulse rate of 84 beats per min. The cardiovascular examination was remarkable for abnormally distended jugular veins up to 12 cm above the sternal angle. Heart sounds were normal with no gallops or murmurs. Chest was clear to auscultation. Abdominal examination revealed a balloting right flank mass. There were no focal neurological deficits. A 12-lead electrocardiogram revealed normal sinus rhythm. Chest roentgenogram was unremarkable. Transthoracic echocardiography showed a large echogenic mass in the right atrium (Fig. 1). Computed tomography of the chest showed enlarged mediastinal lymph nodes and thrombosis of the inferior vena cava extending into the right atrium as a lobulated filling defect. In addition, there was an irregular hypodense mass present in the right kidney. Magnetic resonance imaging scan showed a large posterior cystic mass in the right kidney with abnormal tissue extending through the right renal vein in to the inferior vena cava and up into the right atrium. Intra-operative transesophageal echocardiography confirmed the large irregular mass in inferior vena cava extending into the right atrium (Fig. 2).

Patient underwent a successful complete surgical excision of the tumor from right atrium and inferior vena cava under cardiopulmonary bypass. Right radical nephrectomy with excision of the renal vein was also performed. He was discharged postoperative day-13 with monthly follow up in the oncology department. Histopathologic examination confirmed the tumor to be metastatic renal cell adenocarcinoma. Patient subsequently presented with confusion and was found to have extensive metastasis including cerebral metastasis. At this point the patient and family members opted for palliative care. He survived for seven months but did not experience cardiac symptoms during this period.

Intracardiac extension can be the first presenting feature of the infradiaphragmatic tumors such as renal cell carcinoma with varying incidence of 4–10 % [1, 2]. Other tumors that can have transluminal venacaval cardiac extensions are Wilms' tumor, venous leiomyosarcoma, adrenal tumor, and uterine tumor. Echocardiography often plays a major role in establishing the diagnosis and in guiding surgical therapy in such cases. Transthoracic echocardiography is a useful, non-invasive method of assessing tumor extent in heart and effect of tumor on cardiac hemodynamics. However, it has been shown that transesophageal echocardiograph is superior to transthoracic echocardiography in evaluation and clear delineation of right atrium masses [3]. Recent investigations have indicated that the presence of neoplastic extension into the venous system does not reveal independent prognostic value regarding the clinical course of the disease [2].

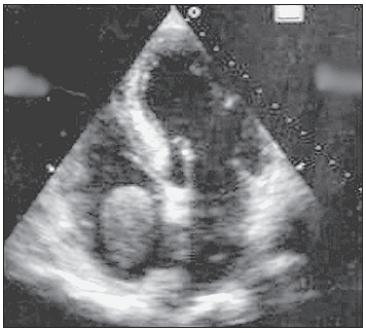

Figure 1. Transthoracic echocardiogram in 4-chamber view demonstrates a large mass in the right atrium

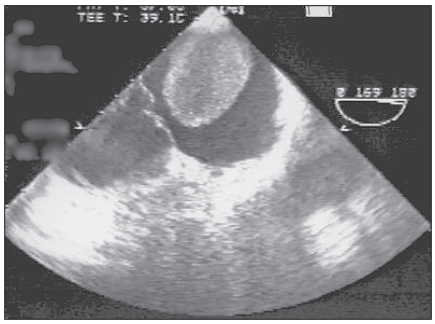

Figure 2. Transesophageal echocardiography in horizontal view: A large mass is seen in the right atrium

Renal cell carcinoma with tumor thrombus extension into the inferior vena cava presents a difficult surgical challenge. Radical surgery associated with cavoatrial thrombectomy with the use of extracorporeal circulation and deep circulatory arrest provide an optimal technique for removing the tumor thrombus in a bloodless field, even in the presence of metastasis, and has good early and long-term results [1].

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From the [1]Mercy Catholic Medical Center, Darby, PA, [2]Long Island College Hospital, Brooklyn, NY, [3]York Hospital, York, PA, and [4]University of Maryland School of Medicine, Baltimore, MD, USA.

Correspondence to: Ijaz A. Khan, MD, University of Maryland School of Medicine, Division of Cardiology, 22 South Greene Street, S3B06, Baltimore, Maryland 21201, USA; e-mail:ikhan@medicine.umaryland.edu

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