

Right Atrial Mass and Tricuspid Stenosis: Renal Tumor with Venous Tumor Thrombus: Case Report

Sağ Atrial Kitle ve Triküspid Stenozu: Renal Tümör ile Venöz Tümör Trombüsü

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ABSTRACT Tumors metastasing to heart can follow either the mediastinum or very rarely the intracavitary way utilizing the caval system. Renal cell carcinoma is a tumor with distinct features; it can invade through renal vein to the inferior vena cava and growths intravascularly sometimes extending through right heart chambers. We describe the case of a 70-year-old female with a huge cardiac mass, almost fulfilling the right atrium, making to and fro movements into the right ventricle with each cardiac cycle across the tricuspid valve causing tricuspid stenosis. The tumor thrombus was completely invaded and arised from the inferior vena cava diagnosed with transthoracic echocardiography, whose primary nidus is renal cell carcinoma thrombus.

Key Words: Echocardiography; carcinoma, renal cell; thrombosis; tricuspid valve stenosis

ÖZET Kalbe metastaz yapan tümörler mediasten yolu ile ve ayrıca nadiren intrakaviter olarak kaval sistemi kullanarak yayılım gösterebilir. Direkt yayılım gösteren Renal hücreli karsinom çeşitli seçkin özellikleri bulunan bir tümördür; bu tümör renal ven yolu ile inferior vena cava ve buradan intravasküler büyüyerek bazen sağ kalp boşluklarına genişleyebilir. Biz 70 yaşında, kalbinde dev bir kitle bulunan, hemen hemen tamamen sağ atriyumunu dolduran, kardiyak siklus ile triküspid kapaktan ileri geri sağ ventrikül içerisine hareket eden ve triküspid darlığına neden olan bir kadın vakayı tanımlıyoruz. Tümör trombüsün inferior vena kavadan köken aldığı ve burayı tamamen invaze ettiği transthoraksik ekokardiyografi ile gösterilmiş olup, bu, primer odağı renal hücreli karsinoma ait trombüstür.

Anahtar Kelimeler: Ekokardiyografi; karsinom, renal hücreli; tromboz; triküspid kapak darlığı

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Malignancies spread to the heart as follows: by direct extension, usually from mediastinal tumor; hematogenously; via lymphatics; and rarely by intracavitary extension from the inferior vena cava or pulmonary veins. Melanomas, renal tumors, including Wilms tumor and renal cell carcinoma, adrenal tumors, liver tumors, and uterine tumors are the most frequent intracavitary tumors.

Renal cell carcinoma with vena caval or right atrial tumor thrombosis is routinely described. Approximately 5% of patients with renal cell carcinoma (RCC) demonstrate tumor extension into the inferior vena cava and 1% into the right atrium. We describe a patient with renal tumor thrombus extending into the tricuspid valve, right ventricular outflow tract and right ventricle, which almost fulfills the right atrium yielding a tricuspid stenosis.

CASE REPORT

A 70-year-old female with a history of type II diabetes mellitus, hypertension complained for weakness, shortness of breath, dyspnea on exertion and palpitations in the last two months. Her past medical history demonstrated +++ hematuria and urinary USG demonstrated left renal tumor. Physical examination did not reveal any abnormal findings except inspiratory augmentation and splitting of S2 with short diastolic murmur best heard at the base of the heart. The ECG and chest X-ray were normal. Abdominal MRI angiography and MRI venography demonstrated normal abdominal aorta with normal take offs for the celiac truncus, bilateral renal arteries and superior mesenteric artery. However MRI was consistent with left renal vein and the inferior vena cava (IVC) at the suprarenal level fulfilled with tumor thrombus, extending through right atrium. Both the vena cava as well as the renal vein was seemed also expanded. Venous system Doppler USG demonstrated normal portal blood velocity, normal portal blood flow, without any signs of hepatic congestion and portal hypertension.

The patient then underwent transthoracic echocardiographic examination, which is consistent with an echogenic mass fulfilling the right atrium (7x5 cm) protruding into the right ventricle with each cardiac cycle as well as yielding a tricuspid stenosis (Maximum/Mean gradient:10/4 mmHg) (Figure 1). The tumor thrombus also extends through the right ventricular outflow tract (Figure 2). We did not recommend cardiac catheterization for the confirmation and exact localization for the tumor extension because of fulfilled vena cava with tumor thrombus. Because of the adequate information obtained with the MRI investigation, we did not recommend Transesophageal echocardiography for the patient.

In a multidisciplinary conference with the patient and her family, a decision was made to proceed with palliative care only.

DISCUSSION

The present case report includes transthoracic echocardiography images of a very rare case with such a large right atrial (almost fulfilling the right

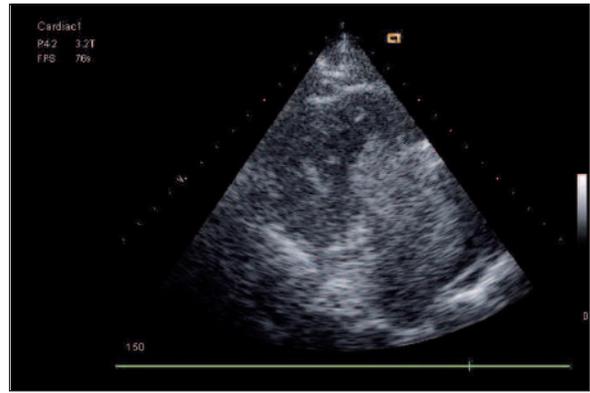


FIGURE 1: Echogenic mass fulfilling the right atrium protruding into the right ventricle with each cardiac cycle as well as tricuspid stenosis.

(See color figure at <http://www.turkiyeklinikleri.com/journal/turkiye-klinikleri-journal-of-case-reports/1300-0284/tr-index.html>)



FIGURE 2: Tumor extending through the right ventricular outflow tract.

(See color figure at <http://www.turkiyeklinikleri.com/journal/turkiye-klinikleri-journal-of-case-reports/1300-0284/tr-index.html>)

atrial chamber) and right ventricular mass, which can be considered as the metastasis of the renal cell carcinoma or Grawitz tumor. The tumor like mass extends through the renal vein into the IVC and right atrium forming a tumor thrombus. Different classification tumor staging exists.^{1,2} This represents tumor stage IV according to Neves and Zinke.² This staging system is as follows;

Stage I- Tumor confined within capsule of kidney

Stage II- Tumor invading perinephric fat but still contained within the Gerato fascia.

Stage III- Tumor invading the renal vein or inferior vena cavae or regional lymph-node involvement, or both.

Stage IV- Tumor invading adjacent viscera (excluding ipsilateral adrenal) or distant metastases.

Although the tumor level does not alter the prognosis significantly, the assessment of endovascular and organ involvement is crucial for the determination of the surgical strategy. We also choose to utilize this pathway for our patient.³ In order to reach this aim several imaging techniques have been utilized such as CT with contrast agent, MRI angiography, venography and echocardiography. Echocardiography, particularly the Transesophageal approach, is of great value in terms of not only diagnosing the tumor for levels III and IV but also intraoperatively for the assessment of cardiac performance as well as confirmation of the extent of vascular involvement and prevent tumor embolization.

Satisfactory transthoracic echocardiographic findings of our case prevented us using invasive diagnostic procedures. MRI is mostly the preferred method of choice because it is non-invasive and avoids the use of contrast agent, which also helped us to yield a nonsurgical approach as a final decision for our patient care. IVC venography is only preserved for patients with equivocal findings on MRI or whom MRI is contraindicated.

For our particular case, although surgical resection of the level IV RCC mass like tumor is recommended for the treatment of choice, because of the widely spread tumor thrombus to IVC as well as inside the right atrium and right ventricular outflow tract, cardiovascular surgeon recommended palliative approach without any surgical intervention.

The echocardiographic diagnosis of a tumor within the heart is not always straightforward.⁴ Dif-

ferential diagnosis that should be considered, apart from metastasis, include primary cardiac tumor, primarily myxoma, vegetation or thrombus. Localization and echogenicity of the cardiac mass and the past medical history often result in an accurate diagnosis. Although the case was not sent to the surgery, we diagnosed our case as venous tumor thrombus metastasing to right atrium based on past medical history as well as the urologic investigation.

Most physicians considered Transesophageal echocardiography (TEE) as the method of choice for optimal visualization of the heart morphology. However TEE was not performed for our patient because of excellent adequate acoustic windows as well as conclusive additional MRI images for our case.

There is naturally no consensus or any guidelines for the optimal management of RCC patients with cardiac and vena cava metastasis such as our case. Surgical resection has been attempted in particular cases, which the tumor growth is restricted in its growth pattern and if the patient is a candidate for surgery.⁵⁻⁷ This was considered as unrealistic for our patient due to the infiltrative growth of the tumor inside the heart and IVC yielding greater technical difficulties in terms of open heart surgery.⁸

As we conclude, renal masses, such as tumor thrombus has to be considered and managed specifically with the patients' clinical and laboratory findings because there is no medical or surgical consensus for the management of this pathology. Echocardiography and MRI has to be kept in mind, while renal tumors or masses are being investigated.

REFERENCES

1. Neves RJ, Zincke H. Surgical treatment of renal cancer with vena cava extension. *Br J Urol* 1987;59(5):390-5.
2. Yazici S, Kiziloz H, Ozen H. [Kidney cancer: diagnosis, staging and prognostic factors]. *Turkiye Klinikleri J Urology-Special Topics* 2011;4(1):32-47.
3. Hatcher PA, Anderson EE, Paulson DF, Carson CC, Robertson JE. Surgical management and prognosis of renal cell carcinoma invading the vena cava. *J Urol* 1991;145(1):20-3.
4. Nesbitt JC, Soltero ER, Dinney CP, Walsh GL, Schrupp DS, Swanson DA, et al. Surgical management of renal cell carcinoma with inferior vena cava tumor thrombus. *Ann Thorac Surg* 1997;63(6):1592-600.
5. Lin CT, Tsai CS, Hong GJ, Tsai YT, Lee CY. Successful treatment for a large renal cell carcinoma with tumour thrombus. *Acta Chir Belg* 2011;111(6):404-6.
6. Rizzo D, Barone G, Ruggiero A, Maurizi P, Furfaro IF, Castagneto M, et al. Massive venous thrombosis of inferior vena cava as primary manifestation of renal Ewing's sarcoma. *Clin Nephrol* 2011;75(6):560-4.
7. Bader MI, Abdelaal K, Rogers T, Arul SG. A surgical approach to Wilms' tumour with retrohepatic vena caval extension. *Pediatr Surg Int* 2013;29(3):229-32.
8. Coats AJ. Ethical autorship and publishing. *Int J Cardiol* 2009;131(2):149-50.