Renal hücreli karsinomla ilişkili bir renal arteriyovenöz fistül olgusu

A case of renal arteriovenous fistula associated with renal cell carcinoma

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Abstract

Renal arteriovenous fistulas are uncommon lesions. Malignancies are one of the underlying cause of arteriovenous fistulas. The clinical manifestation of these lesions vary widely, from asymptomatic presentation to hypertension. Herein we present the case of a 48-year-old man who was presented with heart failure and continuous murmur over the left costovertebral angle. Contrast enhanced computerized tomography showed enlarged left renal vein and arteriovenous fistula on the left kidney. Selective renal angiography confirmed the presence of extremely dilated left renal vein with high-flow arteriovenous fistula. We performed nephrectomy because of the large size and high-output of the fistula.The pathology revealed renal cell carcinoma. In the first month follow-up his symptoms were regressed.

Key Words: Heart failure; renal arteriovenous fistula; renal cell carcinoma; nephrectomy.

Özet

Renal arteriyovenöz fistüller nadir görülen lezyonlardır. Malignensiler arteriyovenöz fistüllerin altta yatan nedenlerinden biridir. Bu lezyonların klinik belirtileri asemptomatik bir sunumdan hipertansiyona kadar çok büyük bir değişkenlik gösterebilir. Biz burada kalp yetmezliği ve sol kostovertebral açıda devamlı üfürüm ile gelen 48 yaşında bir erkek olguyu sunmaktayız. Kontrastlı bilgisayarlı tomografide genişlemiş sol renal ven ve sol böbrekte arteriyovenöz fistül gözlendi. Selektif renal anjiyografi ileri derecede genişlemiş sol renal ven ile birlikte yüksek akımlı arteriyovenöz fistül varlığını doğruladı. Biz bu olguya fistülün boyutunun büyüklüğünden ve debisinin yüksekliğinden dolayı nefrektomi uyguladık. Patoloji sonucu renal hücreli karsinom olarak gelen hastanın 1. aydaki kontrolünde semptomlarının gerilediğini gözledik.

Anahtar Kelimeler: Kalp yetmezliği; renal arteriyovenöz fistül; renal hücreli karsinom; nefrektomi.

Introduction

Renal arteriovenous fistulas (AVFs) are uncommon lesions and have been reported infrequently (1). The majority are iatrogenic (70%) and occur as a result of renal biopsy, blunt or penetrating trauma, inflammation, malignancy, or renal surgery (2). In the literature a large AVF within an RCC has been demonstrated at computed tomography (CT) and magnetic resonance imaging (MRI) in only a few patients (3,4). We report herein an unusual case of renal AVF caused by renal cell carcinoma (RCC) which was diagnosed after the evaluation of the nephrectomy specimen.

Case Report

A 48-year-old man was presented with dyspnea on exercise, orthopnea and left costovertabral bruit. He had no medical history, any surgery or trauma. In his physical examination heart rate was 110 beats/minute in atrial fibrillation and the blood pressure was 150/90 mm-hg.

His cardiology consultation demonstrated high-output heart failure and on his physical examination continuous murmur was revealed over the left costovertebral angle. Serum hematologic and biochemical parameters were within normal levels with trace erytrocyst in urinanalysis. His chest plain was consistent with cardiomegaly and on colour Doppler ultrasound (US) turbulent blood flow was found on the left kidney. Contrast enhanced abdominal CT showed enlarged left renal vein and 7x6x6 cm AVF on the upper pole of the left kidney without any renal stone and/or solid or cystic masses (Figure 1).

Selective renal angiography confirmed the presence of extremely dilated left renal vein with high-flow AVF (Figure 2). In order to successfully embolize the AVF impossible, simple nephrectomy was performed on the left kidney. During the operation anarchic blood vessels and extremely dilated left renal vein were noted with the pulsation on the left kidney.

Macroscopic pathologic investigation of the operation material was revealed 7x5x4 cm solid mass on the upper pole of the left kidney with capsular invasion. Histopathologic diagnosis was clear cell renal cell carcinoma Fuhrman grade-3 and stage T3aN0 (Figure 3-5). Tumour cells were invaded perirenal fatty tissue, but Gerota's fascia, renal artery, vein and ureteral surgical margins were intact.

The patient's symptoms were regressed after 1 month follow-up. His orthopnea was regressed, exercise tolerence was increased and blood pressure was stabl within normal levels.

Discussion

AVF is defined as a single direct communication between a renal artery and an adjacent vein. AVFs comprise about 70-80% of renal arteriovenous abnormalities and can be classified as congenital (14-27%), acquired (70-80%), or idiopathic (2.8%) (5-7). Acquired AVFs are more common than congenital AVFs and usually result from penetrating trauma, percutaneous biopsy, surgery, malignancy, or inflammation (8,9). In a recent presentation 65-year-old woman with hypertension and 20-year history of open surgery for right nephrolithiasis presented with complaints of prominent pulsations and progressive pain in the left flank (10). Her renal angiography demonstrated an arteriovenous fistula near the hilus with

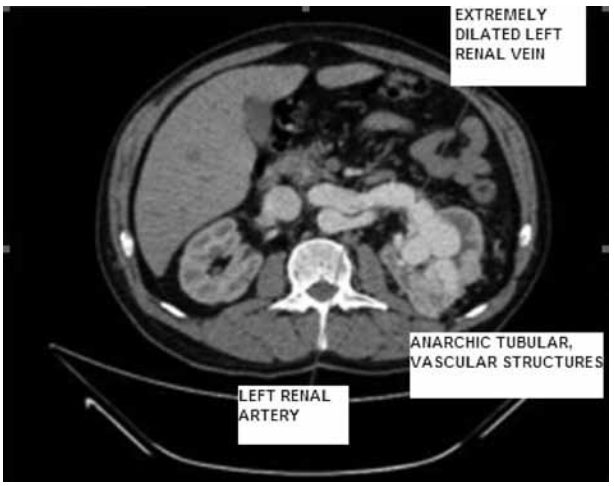

Figure 1: Computed tomography image of renal arteriovenous fistula on the left side and extremely dilated left renal vein.

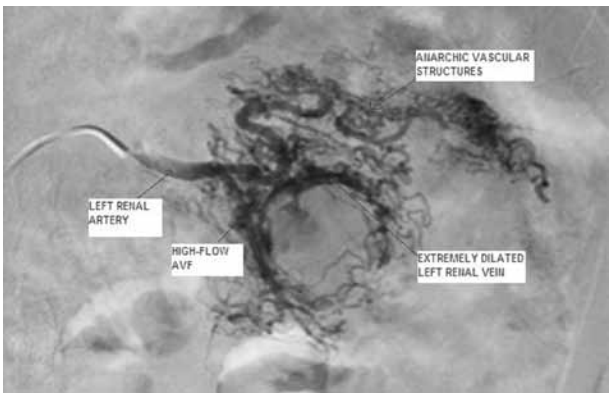

Figure 2: Angiographic images of left renal arteriovenous fistula.

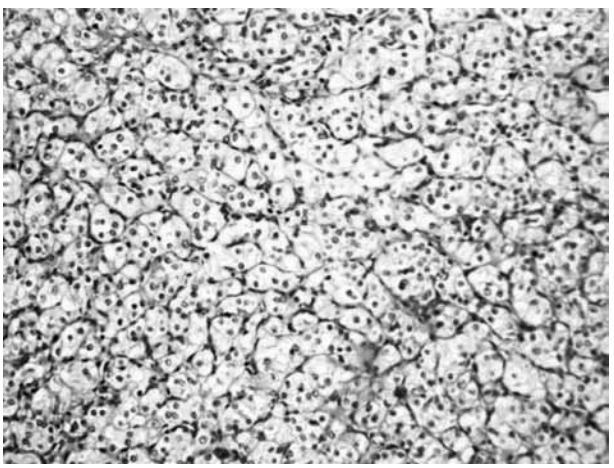

Figure 3: Clear cell renal cell carcinoma that includes thin-walled blood vessels and cell nests that contain clear cytoplasm (H&E, x200).

dilated renal artery, and also dilated, tortuous left renal vein. In our case, the fistula may be a result of an RCC. In the literature a large AVF within an RCC has been demonstrated at CT and MR imaging only a few patients (3,4). Within this phenomenon, the solid components of the tumor may be hidden by the vascular communication (11). Kirac et al presented a 35-year-old man with right flank pain, pollakuria, and hyperdense lesion on the CT (12). They performed right simple nephrectomy considering the likelihood of renal cell carcinoma, but the nephrectomy specimen revealed a congenital cystic arteriovenous malformation.

The clinical manifestations of vascular lesions of kidney vary widely, from asymptomatic presentation, flank pain, hematuria, perinephric hematoma, abdominal mass, flank bruit, and high output heart failure to hypertension (5). This case was presented with the signs and symptoms of high-output cardiac failure. Underlying causes of high-output cardiac failure are anemia, systemic AVF, hyperthyroidism, Beriberi heart disease, Paget's disease, fibrous dysplasia (Albright's syndrome), multiple myeloma, pregnancy, carcinoid syndrome, obesity, polycythemia vera and cor pulmonale (2). In our case left costovertebral bruit was a suspectant sign of a renal AVF.

Imaging studies have critical importance to put the diagnosis of renal AVFs. Color Doppler ultrasound, computed tomography (CT), contrast-enhanced CT angiography, magnetic resonance imaging (MRI) and contrast-enhanced MR angiography have some advantages or disadvantages to confirm the diagnosis of renal AVFs. Catheter angiography remains the gold standart in demonstrating detailed vascular anatomy of renal vascular malformation (5). The angiographic characteristics of hypervascular RCCs include the presence of tumor vessels, pooling of contrast material within abnormal vessels, prolonged staining of the neoplasm, avascular areas due to necrosis or hemorrhage, and arteriovenous communications. These arteriovenous communications may lead to early enhancement of the renal vein and inferior vena cava (IVC) (11).

The indications of intervention in AVFs include renal failure, congestive heart failure, hypertension, hematuria, and a progressive increasing in the size of the fistula, which may cause the risk of rupture (13). Endovascular therapy with embolization is considered as a treatment procedure of AVF, because of the preservation of unaffected renal parenchyma (5). Transarterial embolization is difficult and has some complications in cases of high-flow aneurysmal fistulas, because recognizing details of the hemodynamic anatomy is difficult and a risk of pulmonary embolism exists due to the migration of the embolic agent to the draining vein (1). Surgical treatment with partial or total nephrectomy is the therapy choice for malignancy or very large AVFs (2). In order to treat the underlying cause of high-output heart failure, we planned the endovascular embolization of the fistula, but it was impossible because of the size and high-output shunt. So that, we performed nephrectomy on the left kidney and the pathology result revealed renal cell carcinoma.

In conclusion, clinicians should be aware of renal AVFs, when the patient is presented with high-output cardiac failure. Sometimes solid components of the tumor may be hidden by the vascular communications on the imaging modalities, so that, malignancies, especially RCC should be considered as a cause of AVF. The decision of the therapeutic intervention depends on the underlying cause, size and flow rate of the fistula and in some cases nephrectomy can be a choice of treatment.

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