

A case of renal artery embolism treated by selective intra-arterial infusion of tissue plasminogen activator

Arter içi selektif doku plazminojen aktivatörü ile tedavi edilen bir akut renal arter tromboembolisi olgusu

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Summary– Thromboembolic obstruction of the renal artery is a serious clinical problem, but rarely diagnosed. The diagnosis is not usually established until irreversible renal parenchymal damage occurs. Here, we present a case of renal artery thromboembolism in a patient who had atrial fibrillation and was treated by selective intra-arterial infusion of tissue plasminogen activator (TPA). A 69-year-old male was admitted to our hospital with a one-hour history of palpitation and epigastric pain. He had inferior myocardial infarction and percutaneous coronary intervention to the right coronary artery two weeks before. Coronary angiogram was performed, and no significant stenosis was detected. One hour later, epigastric pain spread to the left flank region. Spiral computerized tomography showed occlusion of the left renal artery. Emergency abdominal angiography was performed, and selective intra-arterial infusion of TPA was started promptly. The abdominal pain disappeared, and urine output remained adequate. Forty-eight hours later, angiographic follow-up confirmed the complete lysis of the thrombus in the left renal artery. No renal or hemorrhagic complications were observed, and the patient was discharged four days later with normalized renal function on oral anticoagulation.

Acute renal artery (RA) occlusion is a rare but organ-threatening problem. Embolization, complicating atrial fibrillation associated with rheumatic disease or myocardial infarction and thrombosis in the presence of atherosclerotic renal disease are among the most frequent etiologies, but emerging and most recent causes include thrombosis complicating endovascular intervention.^[1] The clinical manifestations of acute RA occlusion are nonspecific: severe flank pain, abdominal pain, or both, accompanied by vomiting or

Özet– Renal arterlerin tromboemboli ile tıkanması nadiren tanı konan ve çok ciddi sonuçlara neden olabilen klinik durumdur. Genellikle tanı konduğu anda geri dönüşümsüz böbrek hasarı oluşmuştur. Bu yazıda, selektif arter-içi doku plazminojen aktivatörü uygulanan atriyum fibrilasyonuna bağlı olarak gelişen akut renal emboli saptanan olgu sunuldu. İki hafta önce akut inferior miyokart enfarktüsü tanısıyla sağ koroner artere stent yerleştirilen, 69 yaşında erkek hasta bir saatlik epigastrik ağrı ve çarpıntı şikayetiyle acil servise başvurdu. Hastaya hemen koroner anjiyografi yapıldı ve anlamlı koroner darlığı saptanmadı. Bir saat sonra hastanın epigastrik ağrısı sol böğür bölgesine yayıldı. Spiral bilgisayarlı tomografi anjiyografide sol renal arter dallarında tromboembolik tıkanma saptandı. Abdominal anjiyografi yapılan hastaya selektif arter-içi doku plazminojen aktivatörü uygulandı. Hastanın sol yan ağrısı geriledi ve yeterli idrar çıkışı sağlandı. Kırk sekiz saat sonra yapılan kontrol anjiyografisinde sol renal arter açık bulundu. Hastanın takiplerinde böbrek hasarı ya da fonksiyon bozukluğu saptanmadı. Hasta dört gün sonra oral antikoagülan tedavisiyle taburcu edildi.

nausea, are typical signs and symptoms.^[2] When it is suspected, the diagnosis can be made, but in contrast to the management of chronic RA occlusion, the therapy of acute occlusion remains problematic and challenging, with a paucity of previous work with which to form clinical decisions.^[2] In recent decades, selective infusion of lytic

Abbreviations:

CT	Computerized tomography
LAD	Left anterior descending coronary artery
RA	Renal artery
RCA	Right coronary artery
TPA	Tissue plasminogen activator

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agents into the RA has been reported with increasing frequency and efficacy as an alternative method to treat acute occlusion of the renal arteries.^[3-6]

We report a case of acute RA occlusion treated by catheter-directed intra-arterial infusion of tissue plasminogen activator (TPA).

CASE REPORT

A 69-year-old male was admitted to our hospital with a one-hour history of palpitation and epigastric pain. He had inferior myocardial infarction and percutaneous coronary intervention to the right coronary artery (RCA) two weeks before. His medical history also included coronary stent implantation to the left anterior descending coronary artery (LAD) and hypertension. On the physical examination, his general health situation was moderate. On the ECG, rhythm was atrial fibrillation, 118 bpm, with 0.5-1 mm ST elevations, and Q waves were detected at D2, D3, and AVF derivations. Blood pressure was 100/70 mmHg. First and second heart sounds were normal. There was no additional heart sound or murmur. The system examination was otherwise unremarkable. Blood test results at admission revealed the following: white blood cell (WBC) count 18,410/mm³, lactate dehydrogenase (LDH) >953 U/L, troponin I 0.646, creatine phosphokinase (CPK) 153 U/L, blood urea nitrogen (BUN)

42 mg/dl, serum creatinine 1.5 mg/dl, glutamic oxalacetic transaminase (SGOT) 50 U/L, and glutamic pyruvic transaminase (SGPT) 23 U/L. Based on these results, the patient was diagnosed as acute coronary syndrome, and acetylsalicylic acid, clopidogrel, and heparin were ordered immediately. Coronary angiogram was performed through a transfemoral approach. The LAD and RCA stents were open, and there was no significant stenosis. One hour later, epigastric pain spread to the left flank region. Ultrasonography and a spiral computerized tomography (CT) were performed for a definitive diagnosis. Occlusion of the left RA was detected. Emergency abdominal angiography revealed intraparenchymal branches of the left RA occlusion (Fig. 1a). Selective intra-arterial infusion of TPA was started promptly. TPA was infused as 25 mg by using Judkins right guiding catheter no. 4 (JR-4) into the left RA for 15 minutes, and thereafter, 25 mg was infused intravenously for two hours. The abdominal pain disappeared, and urine output remained adequate. Forty-eight hours later, angiographic follow-up confirmed the complete lysis of the thrombus in the left RA (Fig. 1b). No renal or hemorrhagic complications were observed, and the patient was discharged four days later on oral anticoagulation with normalized renal function. One month later, the serum creatinine level was detected as 1.1 mg/dl; the patient is being followed currently without any problems.

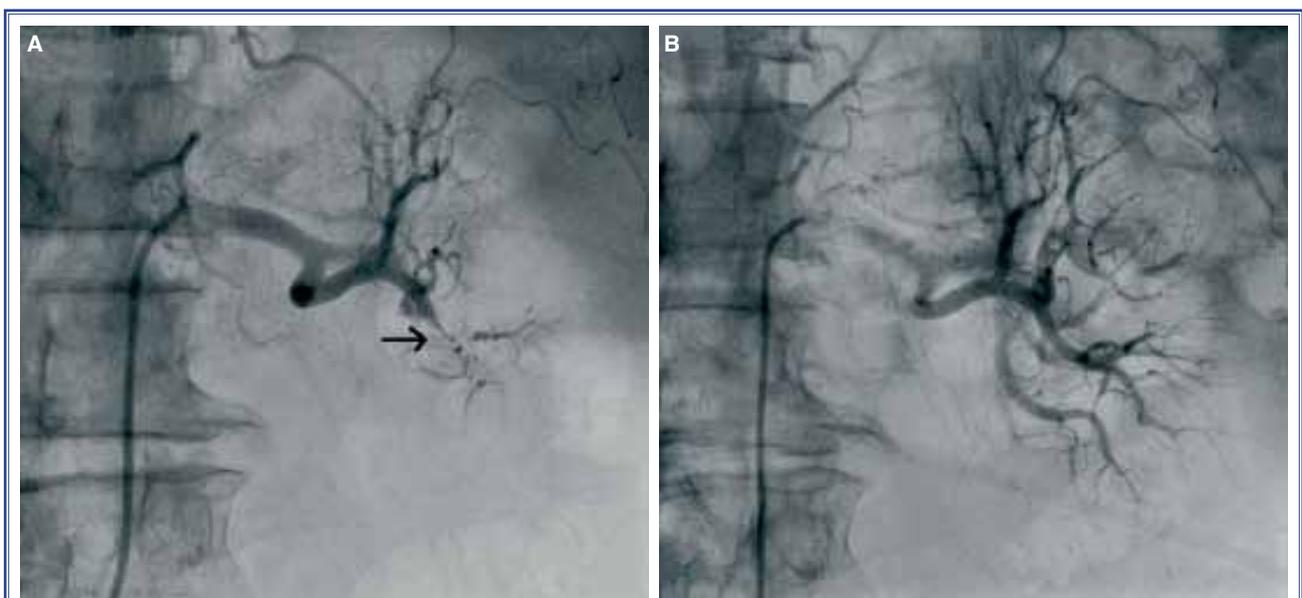


Figure 1. (A) Selective angiography revealed intraparenchymal branches of the left renal artery occlusion. (B) Complete lysis of the thrombus in the left renal artery.

DISCUSSION

Acute arterial thromboembolism is a well-recognized complication of myocardial infarction or cardiac arrhythmia. However, while RA thromboembolism is relatively rare, it is an organ-threatening problem requiring rapid diagnosis and therapy to preserve renal function.^[2] Heparin, local thrombolytic therapy (TPA, streptokinase, urokinase), iloprost, and surgical embolectomy are used for treatment. Over the past two decades, many cases that were managed either surgically or nonsurgically have been reported, but the optimal treatment of patients with acute RA obstruction is still controversial. Angiography is still considered the gold standard to confirm the diagnosis of acute RA occlusion, to define the type of lesion, and above all, it eventually also facilitates the initiation of intra-arterial catheter-directed thrombolysis, if required. There have been several case reports of successful fibrinolysis for unilateral renal embolism, but there is no consensus regarding the use of a thrombolytic agent or dose.^[1,2,7,8] The dose of TPA for treatment of RA embolism was thus decided according to our institutional experience and reported cases. A guiding catheter was used to infuse TPA instead of a microcatheter because diffuse thrombosis was detected in RA branches.

The human kidney can tolerate ischemia up to 90 minutes, while a duration of more than 3 hours resulted in irreversible damage to the renal parenchyma.^[1] Thus, since ischemia lasted less than 90 minutes in this patient, there was complete recovery of renal function with no loss of renal parenchyma observed after thrombolytic therapy. However, there are some case reports of an occlusive event in which the performance of thrombolytic therapy up to 72 hours later was suggested to affect the successful revascularization and recovery of renal function.^[9,10] The most frequent complications after thrombolytic therapy were reported as bleeding and distal embolization.^[11] Clinical, laboratory and radiological parameters are used together for assessment of the response to treatment.

In conclusion, acute renal embolism is a more frequent and serious disorder than expected, and thus, when this illness is suspected, immediate angiographic examination should be done.

Furthermore, many cases have confirmed that thrombolytic therapy is a relatively safe and effective therapy in cases of acute RA occlusion.

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Key words: Atrial fibrillation/complications; catheterization; embolism; kidney/physiopathology; renal artery obstruction/drug therapy; thrombolytic therapy/methods; tissue plasminogen activator/administration & dosage.

Anahtar sözcükler: Atriyum fibrilasyonu/komplikasyon; kateterizasyon; emboli; böbrek/fizyopatoloji; renal arter tıkanıklığı/ilâç tedavisi; tromboemboli tedavisi/yöntem; doku plazminojen aktivatörü/yöntem ve dozaj.