

## RENAL ARTERY EMBOLISM

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### ABSTRACT

We report a renal artery occlusion of embolic origin in a 56-year-old man with long-standing ischemic heart disease, atrial fibrillation, lower limb ischemia and diabetes mellitus. He had also abused alcohol and cigarettes for many years. He was admitted for colic flank pain, which lasted for about 20 hours. The patient had been using anticoagulant (warfarinum natrium) in inefficient dosage. Duplex kidney ultrasound revealed extremely reduced perfusion of the right kidney. Intravenous pyelogram (IVP) demonstrated a nonfunctional right kidney. In angiography, an occlusion of the right renal artery was discovered. Kidney perfusion, with exception of the upper pole, was restored by clot aspiration. Systemic heparin therapy was immediately instituted. Due to the presence of macroscopic hematuria, fibrinolytic agents were not used. IVP next day and renal scan one week later revealed recovery of both kidneys.

Conclusion: Even though renal artery embolism is a rare cause of flank pain, it must be considered in the differential diagnosis of patients with flank pain and certain risk factors, such as atrial fibrillation and valvular disease. Urgent angiography with thrombus aspiration and local administration of fibrinolytics may be instituted in applicable patients.

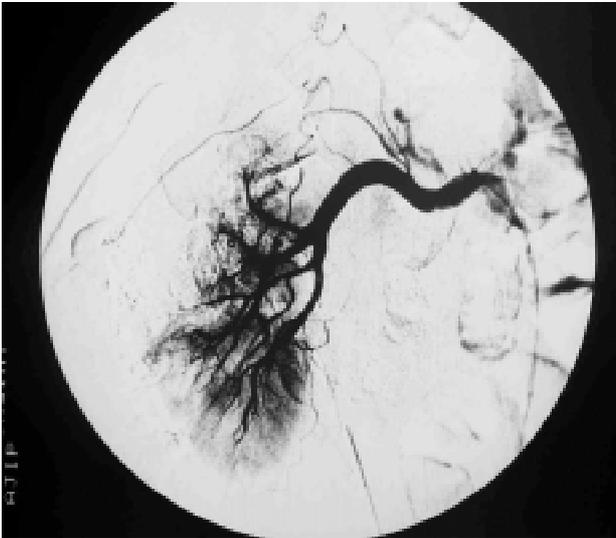
**Key words:** kidney; renal artery; thrombosis; embolization; angiography, Doppler  
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### CASE REPORT

A 56-year-old man with long-standing ischemic heart disease, atrial fibrillation, lower limb ischemia and diabetes mellitus, who had also abused alcohol and cigarettes for many years, was admitted for colic flank pain with projection into the right inguinal region, which lasted for about 20 hours. Nausea and vomiting accompanied the pain. Lumbar percussion was positive on the right side. The patient's blood pressure was 175/105 mmHg. The patient used anticoagulant (warfarinum natrium) in inefficient dosage - International Normalized Ratio (INR) of Prothrombin Time was 1.5 (N = normal value 2-3). Laboratory evaluation revealed leukocytosis values of  $14 \times 10^9/l$  (N  $4.0-10.0 \times 10^9/l$ ), urea 13.9 mmol/l (N 2.5 – 8.3 mmol/l), creatinine 139  $\mu\text{mol/l}$  (N 62 - 120  $\mu\text{mol/l}$ ), bilirubin 27.9  $\mu\text{mol/l}$  (N < 22. 2  $\mu\text{mol/l}$ ).



*Figure 1 - Angiography before treatment. Aortogram demonstrates right renal artery obstruction.*



*Figure 2 - Selective angiography of the right renal artery after thrombus aspiration. Angiography demonstrates revascularized right renal artery, lower pole and medial part of the mid-kidney well contrasted, whereas the superior pole contrasts weakly.*

Duplex kidney ultrasound demonstrated extremely reduced perfusion of the right kidney. IVP demonstrated a non-functional right kidney. Ultrasound of liver revealed multiple tumorous lesions. Right retrograde pyelography was normal. Three hours after admission, the patient underwent angiography, which revealed occlusion of the right renal artery (Figure-1). Kidney perfusion, with exception of the upper pole, was restored by clot aspiration (Figure-2). Systemic heparin therapy was immediately instituted. Due to the presence of macroscopic hematuria, fibrinolytic agents were not used. IVP in the next day (Figure-3) and renal scan one week later demonstrated recovery of both kidneys. The patient died 8 months later. Autopsy revealed cholangiocarcinoma invading the liver with multiple hepatic metastases as basic cause of death. The right kidney was smaller than the left one and the upper pole was shrunken (post-infarction scar).

## COMMENTS

Renal artery embolization (RAE) is a rare disease. One must consider it in the differential diagnosis of flank pain in patients with certain risk

factors, especially atrial fibrillation (55% of RAE) and valvular disease (30%). Other risk factors include history of thromboembolic disease, hypertension, and peripheral vascular disease in conjunction with PTA of coronary arteries or in deep venous thrombosis and patent foramen ovale. Clinical manifestations are as follows: lumbalgia 61%, abdominal pain 28%, nausea and vomiting 21%, and increased temperature. The differential diagnosis must include urolithiasis, pyelonephritis, myocardial infarction, and acute cholecystitis. Angiography is the gold standard for both diagnosis and therapy of renal artery embolism. Ultrasound with color Doppler imaging is a rapid, non-invasive technique, which should be used in the initial diagnostic work-up. The mainstay of today's therapy is the administration of fibrinolytics into the renal artery after clot aspiration. Once kidney reperfusion is established, it is necessary to heparinize the patient, and later initiate warfarinum therapy. The main objective is to establish reperfusion within 90 minutes after onset of symptoms, since after this time the kidney is irreversibly damaged. The long-term outcome of renal function is usually preserved in only 50% of the cases, despite successful revascularization after RAE. It never reaches the levels prior to RAE though. In cases where the symptoms have lasted for over 90 minutes but the renal function stays preserved,



*Figure 3 - Intravenous pyelogram shows normal excretion by the right kidney in the day after clot aspiration.*

are due to the presence of collaterals or the presence of a partial RAE. This was probably the case of our patient.

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