RENAL ARTERY EMBOLISM: A CASE REPORT WITH DYNAMIC COMPUTERIZED TOMOGRAPHY AND CONSERVATIVE MANAGEMENT

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SUMMARY

We report a case of renal artery embolism treated conservatively. Owing to its rare occasion, we reviewed etiology, symptoms, diagnostic methods and therapeutic approaches of renal artery embolism. We conclude that dynamic computerized tomography is a valuable, non-invasive method in the diagnosis of renal artery embolism.

Key words: Renal artery, computerized tomography, embolism.

INTRODUCTION

Emboli to the renal arteries most frequently originate from the hearts of the patients with rheumatic heart disease or myocardial infarction. Subacute bacterial endocarditis, arrythmias, atrial myxomas and artificial heart valves may also cause renal arterial emboli. There is usually a delay in the diagnosis and the treatment of renal arterial emboli. This can be prevented by being more suspicious about it.

Herein we present a case of renal arterial emboli and discuss the diagnostic methods and the conservative versus the surgical treatment of this rare occasion.

CASE REPORT

A twenty eight-year-old man was admitted to our clinic with a two-day history of right flank pain. There were no urinary tract symptoms, nausea and fever. His medical history included acute rheumatic fever at the age of sixteen. On physical examination he had tenderness in the right costovertebral angle. Urinanalysis revealed microscopic hematuria and proteinuria. Admission laboratory data revealed white blood cell 10.000 mm^3, erythrocyte sedimentation rate 29 mm per hour and LDH 327 u. ECG demonstrated atrial fibrillation with a fast ventricular response. Intravenous pyelogram (IVP) showed no excretion of contrast medium from the right kidney on delayed films (Fig. 1). Right retrograde pyelogram (RGP) revealed pelvicaliseal irregularity and a normal ureter (Fig. 2). Renal ultrasonography demonstrated right renal cortical necrosis. Therefore a selective right renal angiography was performed, which showed an occlusion in one branch of the main renal artery (Fig. 3). Computerized tomography (CT) demonstrated cortical necrosis in the anterior of the upper pole of the right kidney (Fig. 4). On dynamic CT there was no uptake of contrast medium by the right kidney (Fig. 5). However, the enhancement of the other kidney was similiar to that of the abdominal aorta. The diagnosis was segmental renal artery embolus and mitral insufficiency. Therefore anticoagulant therapy (Heparin and Coumadin) was begun promptly and the patient digitalized. Complaints disappeared on the third day of the treatment. IVP performed after 15 days revealed a functioning right kidney. Later on mitral valve replasman was performed. Forty-one months after the embolic attack both of the kidneys were normal on IVP (Fig. 6) and he had no complaints.

DISCUSSION

In renal artery emboli, the most typical symptom is a sharp, sudden flank or back pain on the affected side. Nausea and vomiting are the following symptoms. Subfebril fever might be seen. After 24 hours of the renal arterial embolus, abdominal pain and nausea diminish, while flank tenderness persists. Incomplete occlusion of the main renal artery causes hypertension due to activation of renin-angiotensin system. In a patient with rheumatic heart disease, these symptoms should bring the possibility of renal artery emboli into the mind. It is very clear that the early diagnosis and treatment of renal artery emboli can be achieved by more frequent

consideration of this pathology.

IVP gives the first clue to the diagnosis of renal artery emboli. If the renal parenchyma and the collecting system cannot be visualized, this is probably due to the occlusion of the main renal artery. In addition, when one of the branches of the main renal artery is occluded, in nephrogram phase a defect is seen in the affected area. In renal artery emboli as an addition to emboli causing mechanical obstruction, there is also a functional obstruction due to cortical arterial spasm. In our case although there was a segmental occlusion of the renal artery, the kidney was completely non functioning. This was probably because of the cortical vasospasm.

RGP may be helpful to rule out a postrenal obstruction in the nonfunctioning kidneys on IVP. In the early stages of renal artery emboli a normal pelvicaliseal system and a normal ureter are demonstrated by RGP. The irregularity of the pelvicaliseal system seen in our case was probably due to the necrosis because RGP was performed 5 days after the embolic attack.

Angiography is very valuable in the definitive diagnosis of renal artery emboli. The localisation and extension of the emboli in the renal artery may be detected. Angiography also demonstrates renal vascular perfusion. Renal ultrasonography, scintigraphy and CT are other procedures in the diagnosis of renal artery emboli. CT reveals a low attenuation value in the infarction area (1). Dynamic CT shows the kinetic behaviour of contrast medium within a time period in the studied area. After injection of contrast media serial sections are taken and a time-density curve is obtained. There is no contrast accumulation in the infarcted areas. In our case contrast material did not accumulate in the right kidney whereas the values for the left kidney and for the abdominal aorta were normal. We think that the role of dynamic CT in the diagnosis of vascular lesions of the kidney like renal artery emboli is important enough and this procedure is less invasive than angiography.

Still there is not a certain treatment modality because the experience about the treatment of renal artery emboli is limited. Surgical intervention is advocated in emboli affecting both kidneys or a solitary kidney (2,3). An emergency surgical intervention gives the best results although successful results have also been obtained by surgery after 15 even 43 days of the embolic attack (2-6). In renal artery emboli, renal blood flow does not stop completely. Renal circulation may be restored in a certain degree by capsular, peripelvic and periureteral collaterals.

When the contralateral kidney is normal, conservative approach is usually the treatment of choice. The morbidity of the anticoagulant therapy is less than surgical intervention. Lessman et al reported that in 13 cases of renal artery emboli, 3 of which were bilateral, anticoagulation therapy has given successful results (7). According to the latest reports in patients with predisposing factors belonging to the heart like rheumatic heart disease, myocardial infarction or artificial valve prothesis, intra-arterial selective low-dose streptokinase (8-10) intra-arterial papaverin, a vasodilator agent, and low molecular weight Dextran, an intravascular aggregation inhibitor, have also been used in the treatment of renal artery emboli (5). In patients with incomplete renal artery emboli, if hypertension secondary to renal ischemia is seen, revascularisation or nephrectomy may be performed according to the degree of functional renal tissue left.

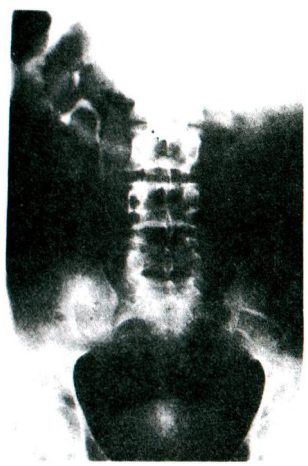

Fig.1: IVP shows no function in the right kidney.

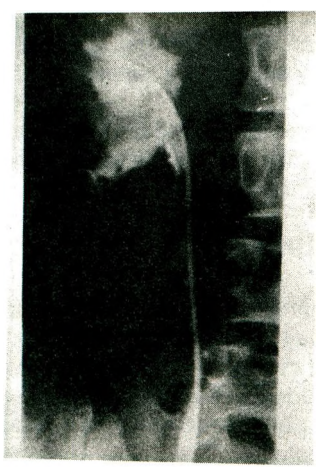

Fig.2: Right RGP shows irregularity due to necrosis in the pelvicaliseal system and a normal ureter.

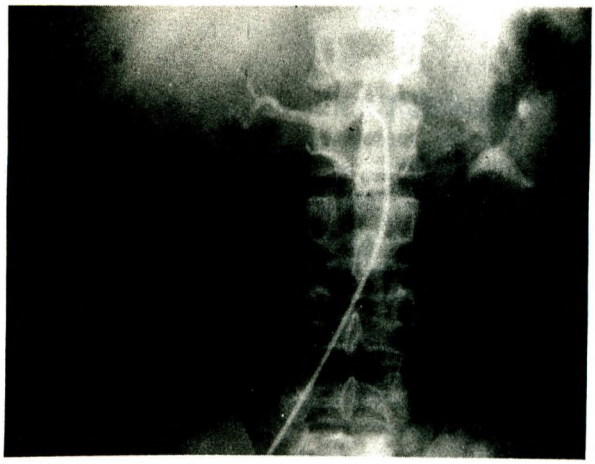

Fig. 3: Selective right renal angiography demonstrates segmental occlusion of the right renal artery

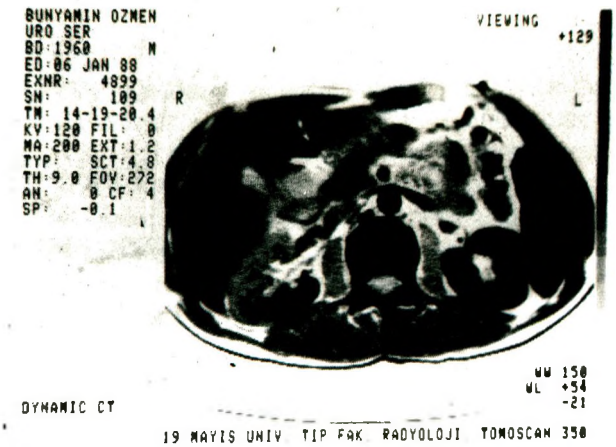

Fig. 4: CT supports ultrasonoraphic findings: cortical necrosis in the right kidney.

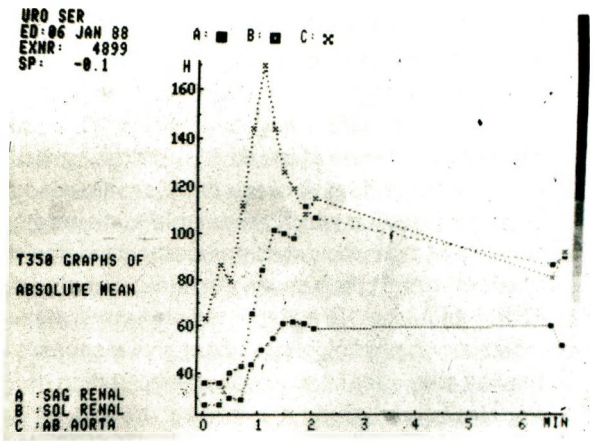

Fig. 5: Dynamic CT reveals no contrast medium uptake in the right kidney whereas the contrast media concentrations of the left kidney and the abdominal aorta are at the same levels.

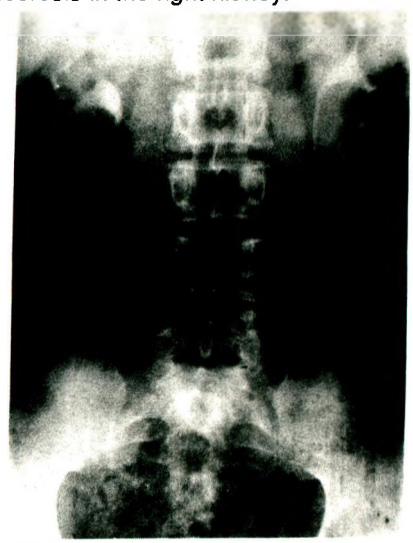

Fig. 6: IVP performed 41 months after the embolic attack shows a functioning right kidney.

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