SHORT REPORT

Recovery of Renal Function after 3 Months of Dialysis in a Patient with Atherosclerotic Renovascular Disease Following Aortoiliac Bypass and Left Renal Artery Reimplantation

S. Simeoni, D. Girelli, * M. Lino, O. Olivieri and R. Corrocher

Departments of 1Clinical and Experimental Medicine, Chair of Internal Medicine, and 2Surgical Sciences, University of Verona, Verona, Italy

Key Words: Atherosclerotic renal artery stenosis; Renal artery reimplantation; Dialysis.

Case Report

A 67-year-old Caucasian man was admitted in September 2001 because of dyspnoea and oliguria. He had a history of smoking, hypertension, and hyperlipemia. On admission, the blood pressure was 160/110 mmHg, there were inspiratory crackles at both lung fields, peripheral oedema, and a bilateral murmur in the periumbilical region. Laboratory investigations showed a normocytic anemia (Hb 8.6 g/dl, MCV 92 fl), with a serum creatinine of 397 mmol/l. The chest X-ray showed cardiomegaly, parahilar pulmonary oedema and a left pleural effusion. An echocardiogram showed severe impairment of systolic function.

Abdominal ultrasonography showed a small right kidney (polo-polar length: 5.8 cm; left kidney: 8.6 cm) and an aortic aneurysm (length 6.2 cm, transverse diameter 4.8 cm) involving both common iliac arteries. The right common iliac artery had maximum longitudinal and transversal diameters of 4 and 4.7 cm, respectively. Doppler ultrasonography revealed significantly reduced blood flow to the left kidney (with resistance index of 0.53) and absence of flow to the right kidney. MR angiography (Fig. 1(a)) showed a significant stenosis of the left renal artery (Fig. 1(b)).

The clinical course was characterised by progressive renal failure and difficulty in maintaining cardiac output despite the use of diuretics, nitrates and dopaminergic drugs. Angiography was performed to explore the possibility of percutaneous angioplasty (PTA). It showed complete occlusion of the left main renal artery, and a sub-occlusive stenosis of a left accessory renal artery (probably corresponding to the patent vessel on MR). PTA was unsuccessful.

Hemodialysis was started, with rapid improvement of cardiopulmonary function. The serum creatinine stabilised around 700 mmol/l, with minimal urine output. In December 2001, an echocardiogram showed improvement of systolic function. Neither angina nor ischemic ECG changes were recorded during dipyridamole echo-stress. Because of the improvement in cardiac function, and the characteristics of the aortoiliac aneurysm, surgical correction by aortoiliac bypass was planned, including reimplantation of the left renal artery.

The procedure was successfully performed in January 2002. Immediately after surgery, the patient recovered a good urine output. On day one, dialysis was performed because of hyperkalemia. Over the next few days the serum creatinine progressively fell to 486 mmol/l. MR angiography showed adequate flow in the reimplanted artery (Fig. 2). Fourteen months later, the serum creatinine was 500 mmol/l, and the patient no longer required hemodialysis.

*Corresponding author. D. Girelli, Department of Clinical and Experimental Medicine, Chair of Internal Medicine, University of Verona, Policlinico G. B. Rossi, 37134 Verona, Italy.
Discussion

Revascularization, mainly by PTA, is increasingly used in patients with renal artery stenosis.\(^1\) Discontinuation of dialysis in selected patients undergoing surgical revascularization shortly after the start of dialysis has been described,\(^2\) while reports of a similar outcome after delayed revascularization are anecdotal. Cohen \textit{et al.} reported successful surgical revascularization in one patient after 6 months of dialysis.\(^3\) He was a young (31-year-old) man with a solitary functioning kidney and occlusion of the ipsilateral renal artery because of fibromuscular dysplasia. In similar conditions, angiographic findings of a patent distal main renal artery, biopsy evidence of viable glomeruli, a renal length $>9$ cm, and a low resistance index at Doppler ultrasonography, have been suggested as criteria for selecting candidates for revascularization.\(^4,5\)

Here we report the unusual case of a relatively old man with severe atherosclerosis, who recovered renal function after 3 months of dialysis. The above-mentioned criteria were not fulfilled. In this case, the decision for a surgical approach was influenced by the concomitant indication for aortoiliac aneurysm repair, but the patient’s determination to undergo surgical treatment potentially enabling him to discontinue dialysis influenced the decision.

This case report illustrates that revascularization can restore renal function in patients with severe atherosclerotic renal disease, even several months after institution of dialysis. In the individual patient, physicians should thoroughly review every clinical aspect and critically consider revascularization, before opting for long-term dialysis.

Acknowledgements

Supported by grants from the Veneto Region, the Cariverona Foundation and MURST and from CNR target project on Biotechnologies.
References