



Case Report

Marked improvement of renal failure and severe hypertension after renal artery stenting in the solitary functioning kidney

Toshiki Sawai (MD)^{a,*}, Masatoshi Miyahara (MD, PhD)^a, Ryuji Okamoto (MD, PhD, FJCC)^a, Kaoru Dohi (MD, PhD, FJCC)^b, Takashi Tanigawa (MD, PhD, FJCC)^a, Norikazu Yamada (MD, PhD, FJCC)^a, Mashio Nakamura (MD, PhD, FJCC)^c, Masaaki Ito (MD, PhD, FJCC)^a

^a Department of Cardiology and Nephrology, Mie University Graduate School of Medicine, 2-174 Edobashi, Tsu, Mie 514-8507, Japan

^b Department of Molecular and Laboratory Medicine, Mie University Graduate School of Medicine, Tsu, Japan

^c Department of Clinical Cardiovascular Research, Mie University Graduate School of Medicine, Tsu, Japan

ARTICLE INFO

Article history:

Received 1 May 2012

Received in revised form 4 November 2012

Accepted 4 December 2012

Keywords:

Renovascular hypertension

Peripheral vascular disease

Chronic renal insufficiency

Renal artery stenting

ABSTRACT

Atherosclerotic renal artery stenosis (ARAS) can cause resistant hypertension, progressive renal failure and/or cardiorenal syndrome. Although no randomized study to demonstrate the superiority of renal stenting over medical treatment is available, a case-sensitive approach is required for the treatment of ARAS. Here, we describe a case report of a symptomatic ARAS patient with a solitary functioning kidney in which successful detection of ARAS by ultrasonography examination with the Doppler method and timely renal artery stenting were performed.

<Learning objective: The clinical efficacy of renal artery stenting for symptomatic ARAS as a method of lowering blood pressure and preventing deterioration in renal function remains unproven. However, renal artery stenting performed based on enough investigation of clinical course and information by ultrasonography examination with Doppler method results in benefit to the patient with ARAS.>

© 2012 Japanese College of Cardiology. Published by Elsevier Ltd. All rights reserved.

Introduction

Renovascular hypertension due to atherosclerotic renal artery stenosis (ARAS) is a major cause of secondary hypertension, and is often severe or resistant to treatment. This hypertension is progressive and causes ischemic nephropathy or renal failure [1]. The STAR and ASTRAL trials, which compared drug treatment and revascularization, showed no superiority of revascularization to drug treatment in terms of the preservation of renal function, blood pressure control, and effects on cardiovascular events [2,3]. However, these studies involved limitations regarding patient enrollments. Thus, a case-sensitive approach is required for the treatment of ARAS. There have been many studies on factors predicting the effects of revascularization [4–7]. We report an ARAS patient with a solitary functioning kidney that was successfully detected by ultrasonography examination with the Doppler method and who was treated by renal artery stenting.

Case report

A 57-year-old female with past history of coronary angioplasty had been treated for hypertension for 10 years, but its control had been poor. In December 2009, she was admitted to our hospital due to acute heart failure by cardiorenal syndrome. The serum creatinine level was 1.3 mg/dl [estimated glomerular filtration rate (eGFR): 33.7 ml/min/1.73 m²]. For the poorly controlled hypertension, three antihypertensive agents, nifedipine CR (40 mg/day), cilnidipine (10 mg/day), and valsartan (80 mg/day), were administered, but her blood pressure remained at 160–170/80–90 mmHg.

Secondary hypertension was suspected for her refractory hypertension, and various examinations were performed. Plasma renin activity was 4 ng/ml/h (normal range: 0.8–2.0 ng/ml/h) and aldosterone concentration was 105 pg/ml (normal range: 30–160 pg/ml). Renal artery ultrasonography examination with the Doppler method revealed the atrophic left kidney with complete obstruction of the renal artery. In the right kidney, ultrasonography examination with the Doppler method revealed that the peak systolic velocity was 204 cm/s, renal to aortic ratio was 3.6, and acceleration time was 120 ms, and these measured values that increased suggested severe stenosis of right renal artery. The resistive index was normal (0.65). Renograms showed that the left kidney was non-functional kidney and the function of right kidney

* Corresponding author. Tel.: +81 59 231 5015; fax: +81 59 231 5201.

E-mail address: tsawai@clin.medic.mie-u.ac.jp (T. Sawai).

decreased. She was discharged after having been treated for heart failure, and treated with the above anti-hypertensive drugs at an outpatient clinic. However, her blood pressure control remained poor, and the serum creatinine level began to gradually increase in May 2010, reaching 2.39 mg/dl in July. Since uremia developed, she was admitted on July 14, 2010 again.

On admission, her blood pressure was 201/100 mmHg, and the serum creatinine level increased to 3.21 mg/dl (eGFR: 12.5 ml/min/1.73 m²). B-type natriuretic peptide (BNP) level was 750 pg/ml. On July 21, selective renal artery angiography showed a severe stenotic lesion from the ostium to the middle portion of the right renal artery (Fig. 1A). A Palmaz Genesis 4.0 mm × 18 mm stent (Cordis Corp., Bridgewater, NJ, USA) was deployed after pre-dilatation (Fig. 1B). A device for distal protection was not used, however, there were no complications such as peripheral embolism, and only 20 ml of contrast agent were used.

The preoperative urine volume was 400–500 ml/day, which markedly increased immediately after the revascularization to 2500 ml/day. The systolic blood pressure decreased to 100–130 mmHg the next day (Fig. 2). The serum creatinine level decreased to 2.07 mg/dl after 1 week. Although the doses of the anti-hypertensive drugs could not be reduced, the systolic blood pressure measured at the outpatient clinic became stable in the range of 130–140 mmHg. The serum creatinine level continued to gradually improve after discharge, and decreased to 1.09 mg/dl in December 2010, 5 months after the revascularization (Fig. 3).

Discussion

In this patient, there were the following 4 important points: (1) Renal artery stenting resulted in marked improvement in renal function and blood pressure. (2) Despite the presence of renal artery stenosis, the values of renin activity and aldosterone were almost in the normal range. (3) On the evaluation for renal artery stenosis and the prediction of the effects of revascularization, renal artery ultrasonography examination with the Doppler method was useful. (4) Renal artery stenting was performed in this case with a solitary functioning kidney.

Improvement in renal function and blood pressure

Many previous reports showed that 8–51% of patients who underwent renal artery revascularization were categorized as having improved renal function and up to 31% had worsened renal function [8], therefore improvement in renal function by renal artery revascularization has been controversial. We will discuss

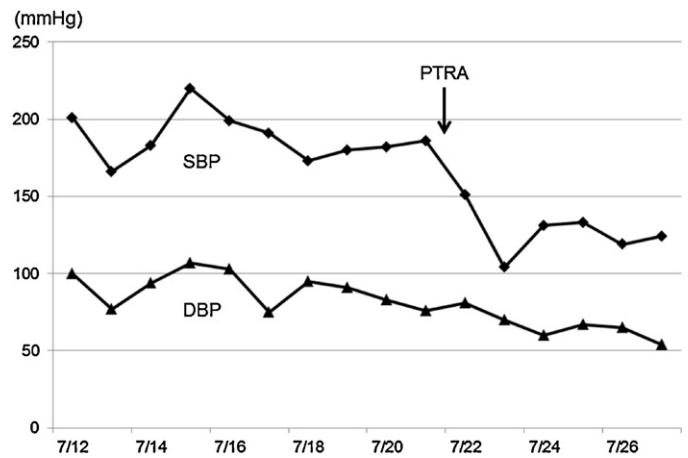


Fig. 2. Blood pressure dramatically improved after renal artery revascularization. PTRA, percutaneous transluminal renal angioplasty; SBP, systolic blood pressure; DBP, diastolic blood pressure.

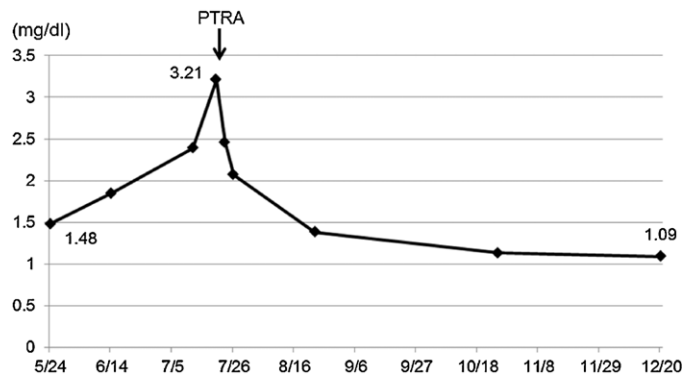


Fig. 3. Serum creatinine level dramatically improved after renal artery revascularization. PTRA, percutaneous transluminal renal angioplasty.

factors predicting an improvement in renal function below. With regard to blood pressure, there are several reports that an anti-hypertensive effect of renal artery revascularization is achieved in many cases [9], and that pre-interventional BNP and translesional pressure gradient may be helpful to identify patients in whom renal angioplasty will improve blood pressure [10,11]. However, it is difficult to get complete normalization of blood pressure, and in this case, the doses of the anti-hypertensive drugs could not be reduced.

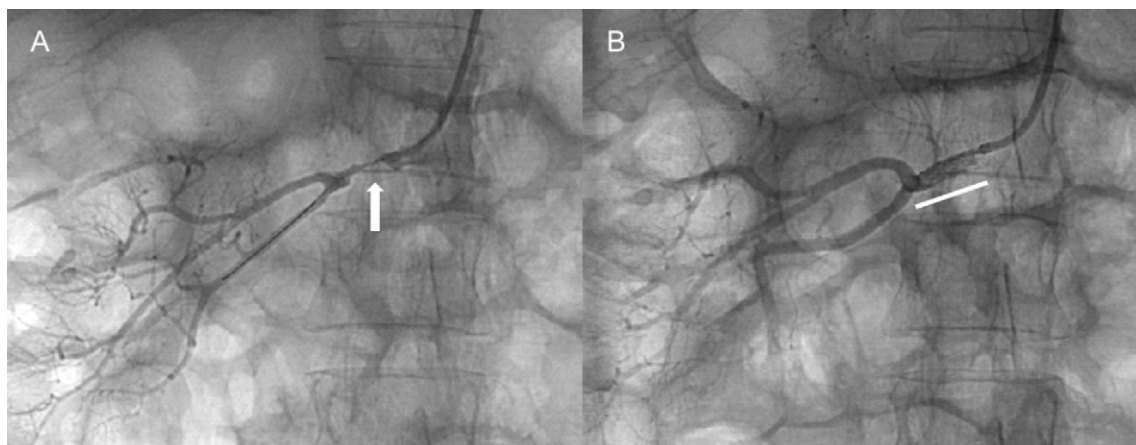


Fig. 1. (A) Pre-procedural right renal artery angiogram. White arrow shows the severe stenosis. (B) Angiogram after stenting. White bar shows implanted stent.

Download English Version:

<https://daneshyari.com/en/article/5984837>

Download Persian Version:

<https://daneshyari.com/article/5984837>

[Daneshyari.com](https://daneshyari.com)