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Case Report

Balloon angioplasty of renal artery stenosis due to Takayasu arteritis in a 2-year-old child

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Abstract

The aim of this report is to demonstrate a 2-year-2-month-old child who presented with a history of malignant hypertension. He was made the diagnosis of Takayasu arteritis by laboratory tests and angiography; we initiated a treatment with sequential balloon predilation. The patient's blood pressure improved dramatically, and patency of renal artery was demonstrated with renal arteriography over 8 months after the balloon predilation. J Am Soc Hypertens 2018;■(■):1–4. © 2018 Published by Elsevier Inc. on behalf of American Heart Association.

Keywords: Hypertension; Takayasu arteritis; percutaneous transluminal renal angioplasty.

Introduction

Takayasu arteritis (TA) is a rare, chronic, and intractable disease of unidentifiable cause involving inflammation of the aorta and its major branches, pulmonary and coronary arteries. It results in dilatation, occlusion, stenosis, and/or aneurysm formation of the affected arteries. These characteristic symptoms of TA patients vary greatly, depending on the affected arteries and the degree of disease progression. These symptoms closely resemble with many diseases causing definitive diagnosis difficult and time consuming. The major peak was significantly higher in the 15- to 29-year age group.[1] The prevalence of TA in the general population is not known precisely, but in children, it is a significant cause of renovascular hypertension. Evaluation and early diagnosis of TA will improve morbidity and mortality. Angiography is commonly used for the diagnosis of TA[2]; we present a case of treatable child hypertension in a 2-year-2-month-old child, who was diagnosed with renovascular hypertension due to TA of the renal artery. He underwent percutaneous transluminal angioplasty; thereafter, his blood pressure became normal without any antihypertensive drug treatment.

Case Report

A 2-year and 2-month old boy was admitted to the pediatric intensive care unit (PICU) with a 2-month history of intermittent vomiting over the preceding, polydipsia over the 2 weeks. He denied a history of photophobia, fever, joint pain, skin rashes on the face, neck, and upper body. He was the second child of nonconsanguineous parents, born by normal vaginal delivery at 37 weeks gestation with a birth weight of 3.95 kg (50th percentile). There was no obvious past history and no family history of hypertension, kidney disease, or TA. At the PICU, he was found to be severely dehydrated with a remarkable dry lip, sunken eyeball, in addition to the overt manifestations of congestive heart failure. His vital signs showed tachycardia (136 bpm), tachypnea (44 bpm), SpO2 (98%), a grade 3/6 systolic apical murmur consistent with mitral regurgitation, and hepatomegaly (liver 1.5 cm below the right costal margin), and hypertension (right arm 130/83 mmHg; right leg 145/67 mmHg; left arm 151/97 mmHg; left leg 136/76 mmHg). Rests of the physical examination were normal. Laboratory results

The authors declare that there are no conflicts of interest related to this study.

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were as follows: urinalysis showed microscopic hematuria (blood±) and protein (3+) in the urine; highly sensitive cardiac troponin I levels were markedly raised (529.3 pg/mL, normal range <100 pg/mL)and NT pro-Brain Natriuretic Peptide (NT-proBNP, 18497.0 pg/mL, normal range <100 pg/mL) were elevated; sodium 129.1 mmol/L (N136–145); potassium 2.9 4 mmol/L (N3.5–5.1); creatinine 29 μmol/L (N 17.6–32.2); renin activity (>500.0 uIU/mL, N 4.4–46.1); and aldosterone (782.0 pg/mL, N 0–353.0). The glomerular filtration rate (GFR) of right kidney is computed as 89.87 mL/min and that of left kidney is 17.67 mL/min with total of 107.54 mL/min; glucose, liver function, a c-reactive protein, an erythrocyte sedimentation rate, thyroid stimulating hormone, adrenocorticotropic hormone, antineutrophilic cytoplasmic antibody were in normal ranges. ECG revealed sinus tachycardia and biventricular hypertrophy. An adrenal magnetic resonance imaging scan was normal. Echocardiography showed that left ventricular hypertrophy (39 mm) and a left ventricular ejection fraction of 50%; chest computed tomography (CT) suggested the infection of pulmonary. CT angiography of the aorta (CTA) showed arterial wall thickening of bilateral common and internal carotid arteries, the aneurysms from celiac trunk up to infrarenal aorta, the long stenosis from the infrarenal aorta up to the iliac arteries (Figure 1A), left renal artery with severe stenosis at the origin, right renal artery with mild stenosis (Figure 1B).

After anti-infective (Cefoperazone Sodium for Injection), antihypertensive (sodium nitroprusside), and other treatments in the PICU, the patient's condition stabilized. Thus, the patient was transferred to the pediatric ward. Oral antihypertensives (amlodipine besylate 5 mg bid po, spironolactone tablets 10 mg bid po, bisoprolol fumarate 2.5 mg bid po) were administered, and blood pressure fluctuated between 85–126 (systolic blood pressure) and 39–80 mmHg (diastolic blood pressure).

The patient was diagnosed as having TA. After discussion among pediatric and cardiovascular intervention specialists, a decision was made to perform percutaneous transluminal renal angioplasty (PTRA) of the left renal artery. On day 24 of hospitalization, PTRA was performed. A 5-F vessel sheath was inserted after puncturing the right femoral artery under general anesthesia and localization using B-mode ultrasonography. Nonselective imaging of the aorta revealed 95% stenosis of the left renal artery origin and 50% stenosis of the proximal segment of the right renal artery. After repeated attempts with Runthrough (Floppy, Terumo, Japan), Balance Middleweight (Hi-Torque, Abbott Vascular, USA), and Sion (Asahi Intecc Co, Aichi, Japan)

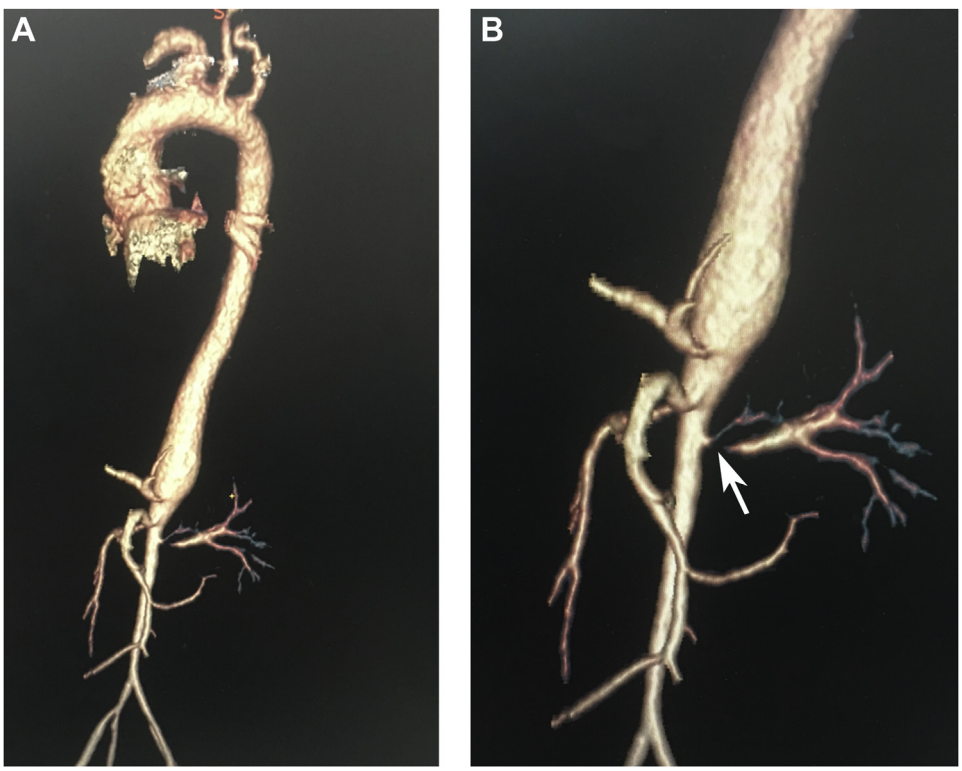

Figure 1. (A) CT angiography of the aorta showed arterial wall thickening of bilateral common and internal carotid arteries, the aneurysms from celiac trunk up to infrarenal aorta, the long stenosis from the infrarenal aorta up to the iliac arteries. (B) Left renal artery with severe stenosis at the origin (white arrow), right renal artery with mild stenosis.