42. Treatment of Renovascular Hypertension by Percutaneous Transluminal Angioplasty of Two Renal Arteries in a 5-Year-Old Boy

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Case Description

In a 4.5-year-old boy (17.5 kg, 105.5 cm) with dizzy spells, headache, and epileptic attacks a blood pressure of 180/130 mm Hg was observed. Stenoses in the left renal artery and in a right renal polar branch were shown angiographically (Fig. 1a, arrows), and renovascular hypertension was diagnosed after exclusion of other causes. Systemic renin was elevated (40 ng/ml per hour). The boy underwent bilateral percutaneous transluminal angioplasty (PTA) under general anesthesia on 23 October 1980. An F-8 guiding catheter (custom-made prototype by Schneider and Co., Zurich) was introduced through the femoral artery, and a Grüntzig coronary dilatation catheter (balloon width 3.7 mm) was applied. After dilatation both stenoses were widely patent (Fig. 1b). Blood pressure dropped to normal values within 4 h (110/80). During the follow-up of 1.5 years the blood pressure remained normal without any antihypertensive therapy except atenolol for the initial 2 months following PTA. Systemic renin was normal (9.4 ng/ml per hour) 6 months after PTA. Angiography performed 1.5 years after PTA revealed patent renal arteries at the two dilated sites (Fig. 1c, arrows).

Comment

Renovascular hypertension in children is a rare but pertinacious disease [1] requiring careful medical or surgical therapy. The underlying cause is usually fibromuscular dysplasia, and the angiograms suggest that the boy described probably belongs to this group of pediatric patients. Our positive experience with PTA for fibromuscular dysplasia in adult patients [3, 4] and the availability of the coronary dilatation catheter set [2], suitable for small arteries, encouraged us to try PTA for treatment of renovascular hypertension in this small child.

This case demonstrates that PTA of renal arteries in children with renovascular hypertension may result in normalizing blood pressure as observed in follow-up studies in adults [4]. Even though results of renovascular surgery in such patients are excellent [5], PTA compares favorably in terms of morbidity and expense. However, this is an example of an experimental application of PTA that should be performed only with the backing of experienced vascular surgeons in case of failure or complications.
Fig. 1. **a** Renal angiogram in a 4.5-year-old hypertensive boy before PTA of the upper right polar branch artery and the left main artery (arrow). **b** Angiogram immediately after dilatation of the two stenoses on the left and right sides (arrows). **c** Angiogram 18 months after PTA showing patent renal arteries bilaterally (arrows).