

AN 8-YEAR-OLD BOY WITH RENAL ARTERY STENOSIS AND CEREBRAL INFARCT

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Abstract

Secondary hypertension is more common in children compared to that in adults, leading to organ damage and increased mortality. Renal artery stenosis could be a sequel to secondary hypertension in children and give rise to serious outcomes. A case of renal artery stenosis in an eight year old boy is presented in this study in whom PTA was performed with successful results. Blood pressure was controlled and all antihypertensive drugs could be withdrawn in a short period of time.

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Presentation of Case

An 8-year-old boy presented with history of headache and blurring of vision, weakness in left side of the body for one month. Physical examination revealed a conscious (Glasgow coma scale – 9 to 10), oriented, mildly edematous boy with puffy face. His pulse rate was 120 per minute which was regular in rhythm, and normal in volume. There was no radio-radial and radio-femoral delay. Blood pressure was 190/100 mm Hg in both upper limbs and 180/100 mm Hg in both lower limbs. Common carotid pulsations were equal on both sides. Carotid bruit was absent on both sides though audible only over right renal angle. Examination of cardiovascular system revealed that jugular venous pulsation was not raised. There was no visible cardiac impulse present. Apex beat was placed normally in the left fifth inter-costal space just lateral to mid clavicular line. First and second heart sounds were normally audible and there was absence of murmur.

Sensory and motor responses were found intact on neurological examination though all deep reflexes on left side were exacerbated and left planter response was extensor. Deep reflexes on right side were intact. Respiratory system and other systemic examination were normal. The optic fundi were normal.

Hematological examination showed that hemoglobin level was 11.9gm / dl, erythrocyte sedimentation rate (ESR) was 30 mm in first hour, total count of red blood cell was 4.44 m/ μ l and total leukocyte count was 13,900/cumm (Neutrophil-82%, Lymphocyte-13%). Peripheral blood film showed that red blood cells were normocytic and normochromic. There was neutrophillia with cytoplasmic vaculation in some neutrophils, platelets were normal. Liver function tests, serum electrolytes, lipid profile and renal function tests were found normal. HBsAg, Anti-HCV, Anti-HIV and TPHA were negative.

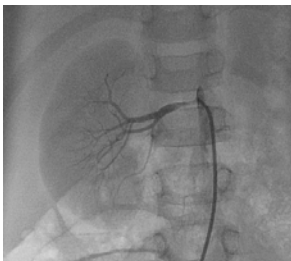


Fig-1a. Right renal artery stenosis



Fig-1b. After PTA of right renal artery

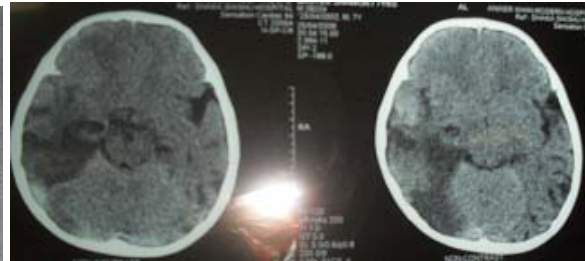


Fig-2. Computed Tomography scan of brain: Acute massive right cerebral infarct with focal hemorrhagic transformation in right temporal region, small infarct in left parietal region.

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Urine examination revealed nothing abnormal. Twenty-four hours urine volume was 700 ml and vanillylmandelic acid (VMA) in 24 hr urine was estimated at 2.2mg. Ultrasonography (USG) of kidneys, ureters and urinary bladder was found normal in size (Right Kidney-6.2cm, Left Kidney-8.1cm) shape and position. Cortex and medulla were found well differentiated.

Cardiovascular system examination was found normal. Electrocardiographic (ECG) tracing was normal. Radiological examination of chest and echocardiography were found normal. Coronary angiogram showed that epicardial coronary arteries were normal and flash aortogram ruled out coarctation of aorta.

Renal duplex study revealed that the right renal artery was stenosed with reduced perfusion and the right kidney was relatively smaller than the left kidney (Figure 1a & 1b). Tc-99m DTPA confirmed that the right kidney was non-functioning (17%) but, left kidney was functioning normally (83%).

For neurological deficiency, computed tomography scan of brain was done. A massive right cerebral infarct with focal hemorrhagic transformation in right temporal region was detected together with one small infarct in left parietal region (Figure 2).

As soon as the diagnosis of stenosed right renal artery was confirmed, a percutaneous transluminal angioplasty (PTA) was done with bare metal stent (3.0X13 mm) in the same setting. The patient was discharged with antihypertensive and anti-platelet drugs. He was advised to continue physiotherapy of affected limbs and to maintain weekly follow-up for a month and fortnightly thereafter. During follow-up, his clinical condition improved significantly. Hematological values, serum creatinine, urine analysis were becoming normal, and more importantly, blood pressure was found controlled with gradual reduction of antihypertensive drugs. However, antihypertensive and anti-platelet medication continued as monitored by follow up.

Discussion

Primary hypertension is uncommon in children¹ but secondary hypertension is common. Although it is generally agreed that early hypertension poses little immediate risk to most children, evidence from studies in children and adolescents have shown hypertensive heart disease and hemodynamic changes consistent with adverse effects of mild hypertension before the third decade of life.²⁻⁸ Secondary hypertension is more common in children than in adults and can lead to organ damage and increased mortality

which is multifaceted, but the renovascular hypertension (RVHT) is an important cause of secondary hypertension in children accounting for 5-25% of cases.^{5,7,8} Progression of renal artery stenosis (RAS) to occlusion is more likely with more severe (more than 60%) lesions and occurs at a rate of 10-20% per year.

Aims of the treatment modalities like medical treatment, PTA and surgery are done usually to control blood pressure and preservation of renal function. In our case, we performed PTA, which resulted in controlling blood pressure and finally normotensive with gradual withdrawal of number and doses of several antihypertensive drugs.

So, we conclude that severe degree of hypertension in children with or without clinical signs must be investigated promptly. Renal arteriography should be considered while working-up in order to make proper and timely diagnosis and treatment. Although renal angiography remains a gold standard, radiological procedures may also be performed for accurate evaluation, diagnosis and treatment.

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