Pediatric renal artery stenosis: a 19-year experience in management and outcomes at a tertiary pediatric hospital

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Purpose: Renal artery stenosis (RAS) is an uncommon cause of pediatric hypertension. Guidelines for the work up and management of pediatric RAS have not been established. The most widely reported etiology of pediatric renovascular disease has been fibromuscular dysplasia (FMD); however, other etiologies, including middle aortic syndrome and vasculitides have been described. We reviewed cases of pediatric RAS at our institution in order to identify etiologies, management, and long-term clinical outcomes of pediatric renal artery stenosis in our population.

Materials and Methods: Imaging reports for duplex ultrasound, computed tomography angiography, magnetic resonance imaging, and conventional angiography from an academic child’s hospital between 2000 and 2019 were evaluated. Images from positive reports for patients < 18 years were reviewed by a vascular surgeon and a radiologist to confirm a diagnosis of RAS. Patient charts with positive radiologic diagnosis were then reviewed for demographics, indications for evaluation, management and long-term clinical outcomes of pediatric RAS.

Results: Imaging reports for 984 children were identified as part of evaluation for RAS (female: 25 [60%]; male: 17 [40%]; mean age: 9.7 years [range 0.04-17]). Forty-two patients were found to have evidence of RAS based on screening imaging (Duplex 93%; MRA/CTA 7%) though 4 had normal findings on repeat exam. Of the 38 patients found to be positive on imaging, 34% (n = 13) required intervention for their disease. Unexpectedly, only 16% (n = 2) of patients had FMD. Interestingly, 58% (n = 7) of patients had concomitant RAS and aortic pathology (4 middle aortic syndrome; 2 thoracoabdominal vasculitis; 1 aortic thrombus). Long-term follow up (33.8 months) of the conservative management cohort reported the following outcomes: 20.6% had spontaneous resolution of HTN, 20.6% were managed with lifestyle modifications, 44.8% were managed with medical therapy, 13.7% were lost to follow-up or died.

Conclusions: Pediatric renal artery stenosis is a low frequency disease and long-term outcomes have been underreported. The incidence of associated aortic pathology in our intervention cohort appears higher than previously reported in the literature. Long-term follow up of the conservative management cohort demonstrated that up to 40% of patients could be managed successfully without any therapy.