18. Percutaneous Angioplasty of 24 Developmental Dysplastic Renal Artery Stenoses: Failure Modes and Operative Management in Pediatric Patients

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OBJECTIVES: Endovascular treatment of renal artery stenoses is most often undertaken in adults and uncommonly performed in children with developmental renal artery narrowings. Anecdotal case reports and small case series suggest that percutaneous angioplasty (PTA) with or without stenting is a safe and effective option in children, despite short follow-up and a number of instances where treatment was ineffective or hazardous. The purpose of this work was to assess the mode of these failures and their operative management.

METHODS: Eighteen children (11 girls, 7 boys) with renovascular hypertension underwent treatment over a 13 year period, for failures of PTA with (5) and without (13) stenting. Sixteen patients were referred to the authors' institution from distant hospitals. The mean age at the time of the initial endovascular intervention was 9.2 years (range of 2mo to 18years). Bilateral endovascular procedures had been performed four times. Six patients had undergone repeated endoluminal procedures without success. Failures associated with PTA alone included: recurrent stenoses (11), arterial occlusions (2), arterial rupture (1), pseudoaneurysm formation (1), and microembolization (1). Failures in the PTA-stented group included: in-stent stenoses (5), stent migration (1), as well as arterial occlusions (2) and obstruction due to kinking of overlapping stents (1).

RESULTS: All 18 children presented with severe recurrent or persistent renovascular hypertension. Secondary renal revascularizations of 23 of the 24 affected vessels included: renal artery-aortic reimplantation (11), aortorenal bypass with a hypogastric artery graft (7), iliorenal bypass (1), and splenorenal bypass (1). Nephrectomy was performed in the presence of unreconstructable arteries (3). The patient with renal microemboli remains unoperated, on drug therapy alone. Follow up averaged 4.6 years. Operative benefits were less than expected, with hypertension being cured (9), improved (7) or unchanged (1). There was no perioperative renal failure or mortality.

CONCLUSIONS: Endoluminal treatment of pediatric renal artery stenoses may be complicated by complex failures requiring carefully executed operations. PTA with or without stenting appears to have limited value in developmental pediatric renovascular disease.