

7 Year Follow up of Renal Artery Stenosis due to Fibromuscular Dysplasia

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Case Presentation

A 23 years old absolutely alright one month back when he developed high grade fever, consulted some General practitioner at Multan and was found hypertensive during his routine check-up. His routine lab investigation showed persistent hypokalemia. He was referred to cardiology OPD with uncontrolled hypertension. He was given ACE inhibitor and beta blocker were given but the hypertension remain uncontrolled. His serum urea 20 mg/dl (15 – 45 mg/dl) Serum creatinine 0.8 mg/dl (0.4 – 1.4 mg/dl).

Urine examination: Unremarkable.

Abdominal Ultrasound: Right kidney slightly smaller. Compensatory hypertrophy of left kidney.

Renal Scan: Slightly reduced functioning left kidney. Reduced functioning small sized, right kidney.

Echocardiography: Normal, with normal ejection fraction.

Angiography was planned which shows right sided

renal artery stenosis. Angioplasty was done on 11/07/2001 with TIMI grade III adequate post stenting blood flow. After the angioplasty patient remain normotensive without antihypertensive medication.

Follow up angiography was done on 26/3/2003 which shows normal functioning patent right renal artery stent. Complete blood count urea creatinine, within normal limit. 2007 patient Color Doppler of renal artery was done which shows normal patent renal arteries and no antihypertensive medication was given to this patient in these 8 years. So angioplasty with stenting is the treatment of choice for renal artery stenosis due to fibromuscular dysplasia.

Clinical Discussion

Renovascular hypertension is one of the most common causes of secondary hypertension.¹

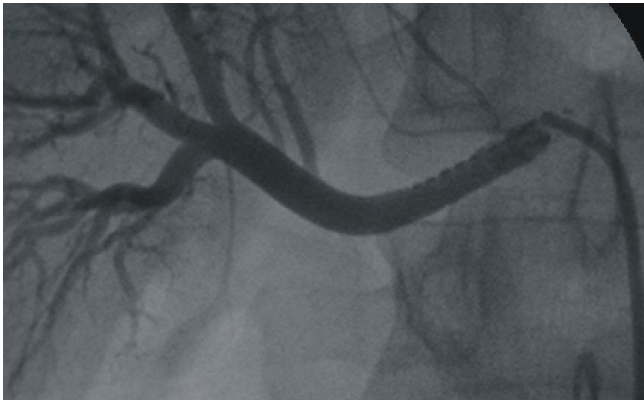
Renal – artery stenosis may occur alone or in combination with hypertension, renal insufficiency or both. Patients with renal-artery stenosis alone may benefit from revascularization to prevent loss of renal mass. Renal – artery stenosis may result in refractory hypertension and end – stage kidney failure.² In patients with renal – artery stenosis and hypertension, hypertension is seldom cured by revascularization, except in those with fibromuscular dysplasia.³ In contrast to atherosclerotic renal – artery stenosis, fibromuscular dysplasia rarely leads to renal – artery occlusion.⁴ FMD is most often diagnosed in the renal arteries, accounting for 60 to 75 percent of cases⁵. Approxi-

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mately 25 percent of patients have multiple arteries involved.⁶ Most cases of FMD are diagnosed in patients younger than 50 years.⁷ Angiographic disease progression occurs in a significant number of patients (over 30 percent of cases in some reports).⁸ Renal artery FMD should be suspected, particularly in women under the age of 50: Severe or refractory hypertension, Onset of hypertension before the age of 30 years, a sudden rise in blood pressure over a previously stable baseline.



Monitoring Disease Progression: The patient who is being treated medically (e.g, not eligible for or refusing intervention) patient should have monitoring of the blood pressure response to antihypertensive therapy and serum creatinine levels every three months. Angiographic disease progression, defined as a new focal lesion, worsening stenosis, or enlargement of a mural aneurysm, occurs in up to 37 percent of patients.

Management: Fibromuscular dysplasia appears to be effectively treated with balloon angioplasty; the optimal management of atherosclerotic renal – artery stenosis remains controversial.⁹ Treatment options for patients with renal artery FMD include medical therapy alone, or revascularization by either percutaneous transluminal angioplasty (PTA) or surgery.¹⁰ However, independent of angioplasty, hypertension should be treated, according to recommendation of Joint National Committee on the Prevention, Detection and Treatment of High Blood Pressure 7 (JNC 7).^{11,12} The initial drug class of choice in FMD is an angiotensin-converting enzyme inhibitor (ACE inhibitor) or angiotensin – receptor blocker (ARB).¹³

Renal Artery Vascularization: The reported hypertension cure rate ranges from 20 to 85 percent, and most remaining patients are improved.¹⁴ In one report,

hypertension was cured following angioplasty in 62 versus 28 percent of patients with unilateral, isolated renal FMD versus systemic FMD, respectively. Although revascularization does not reverse cortical thinning and lost renal mass, renal function appears to be stabilized.¹⁵

Indications for Revascularization: Based on this reasoning, it is generally recommended that the following patients have renal artery revascularization:

- Those with recent onset hypertension, in particular younger patients who are less likely to have underlying atherosclerotic disease, in whom the goal is to cure hypertension or significantly reduce the number of antihypertensive medications.
- Patients whose blood pressure cannot be lowered to desired ranges despite compliance with a reasonable medication regimen.
- Patients who are unable to tolerate antihypertensive medications or are non-compliant with their medication regimen.
- Patients with loss of parenchymal mass from ischemic nephropathy.

Success Rate

Procedure success rates for renal stent placement in RAS are greater than 95%.¹⁶ The reported technical (angiographic) success rates for PTA, defined in some studies as visually estimated angiographic residual stenosis less than 50 percent, range from 83 to nearly 100 percent.^{17,18} Hypertension is usually cured (22 to 59 percent) or improved (22 to 74 percent), but a significant proportion fail to improve (2 to 30 percent).^{19,20} Systolic blood pressure response was better in patients with FMD affecting the main renal artery than in patients with branch vessel involvement.²¹

Complications of PTA are mostly related to vascular access. In rare cases, renal artery perforation, dissection, or segmental renal infarction may occur.²² Patients who undergo percutaneous revascularization should undergo periodic duplex ultrasound examinations to detect disease progression, restenosis, or loss of kidney volume.²³

Surgery: Before the advent of PTA, surgical revascularization was the primary therapeutic alternative for patients with refractory hypertension. In contemporary surgical series, technical success rates are greater than 88 percent, long-term blood pressure was cured in 33 to 63 percent, and improved in 24 to 57 percent.²⁴

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