

## RENAL ARTERY STENTING IN PATIENT WITH SINGLE KIDNEY WITH STABLE ANGINA

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### ABSTRACT

Renal artery stenosis (RAS) is a frequently encountered problem in clinical practice. The disease encompasses a broad spectrum of pathophysiologies and is associated with three major clinical syndromes: ischemic nephropathy, hypertension, and destabilizing cardiac syndromes. The two most common etiologies are fibromuscular dysplasia and atherosclerotic renal artery disease with atherosclerotic disease accounting for the vast majority of cases. Atherosclerotic renovascular disease has considerable overlap with atherosclerotic disease elsewhere and is associated with a poor prognosis. A wide range of diagnostic modalities and treatment approaches for RAS are available to clinicians, and with the advent of endovascular interventions, selecting the best course for a given patient has only grown more challenging. Several clinical trials have demonstrated some benefit with revascularization but not to the extent that many had hoped for or expected.

**KEYWORDS :** Renal artery, atherosclerosis, fibromuscular dysplasia, hypertension, nephropathy, renal angioplasty

### INTRODUCTION

Renal artery stenosis is general term that refers to any vascular lesion causing narrowing of the renal artery thereby impairing blood flow to the kidney. This disease encompasses a broad range of pathophysiologies, the two most common being fibromuscular dysplasia (FMD) and atherosclerotic renal artery disease.<sup>1,2</sup> Depending on the degree of narrowing, patients can develop hypertension called renal vascular hypertension (RVH). This form of hypertension is the most common cause of secondary high blood pressure. Management of Renal artery stenosis is controversial. Many Trial (ASTRAL, EMMMA, SNRASC, DRASTIC) are debatable.<sup>3</sup> Pathophysiology of RAS is Resistant Hypertension (RAAS System), so there can Ischemic nephropathy and it can be prevent with renal angioplasty. Epidemiology of single kidney is unknown.<sup>4</sup> Etiology are fibromuscular dysplasia (FMD) that usually single kidney and common cause renal failure.<sup>5,6</sup> Renal angioplasty will decrease systolic and diastolic pressure.

### CASE HISTORY

This case is 61 year old Female, was admitted to hospital because atypical angina on exertion. She didn't have symptoms of dyspnea, short of breath, fatigue, palpitation, dizziness, syncope and leg edema. She had resistant hypertension. No other comorbidity. Physical examination, X Ray thorax, routine blood tests were normal (Cr 1.10 mg/dl). Echocardiography showed EF 60 % and no regional wall motion abnormality. Treadmill test showed positive ischemic response test V4-V6 in 10 minutes. She have given drugs (Aspirin, Amlodipine 10 mg, Metoprolol 25 mg and Telmisartan 80 mg). However we have planned angiography of both coronary and renal.

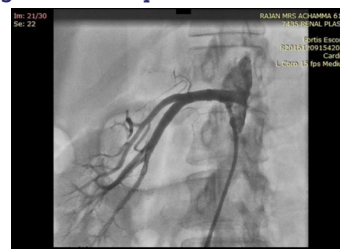
### IMAGING

Coronary angiography was done which revealed normal

coronary arteries. But Renal Angiography showed single kidney and 90-95% ostial stenosis at right renal artery and absent left renal artery. So we planned renal angioplasty.



**Figure 1: Renal angiography showing 90-95% stenosis of proximal right renal artery**



**Figure 2: Renal angiography after successful angioplasty**

### INDICATION FOR INTERVENTION

She was appropriate for coronary angiography because she have angina and positive treadmill test. So continuing renal angiography showed stenosis 90-95 % at proximal right renal artery. Based on guidelines SCAI Expert Consensus Statement for Renal Artery Stenting, Appropriate Use Renal Angiography in Catheterization and Cardiovascular Intervention 84:1163-1171 (2014), this case have appropriate

for renal angiography. So, if renal stenosis more than 80% by quantitative angiography, she should plan revascularization (renal stenting).

## INTERVENTION

### Procedure of Renal Artery Stenting

Sheath (7 Fr) was inserted into the right femoral artery, guide wire (GW) 0.014 soft tip all-star and guide catheter (GC) 3.5 RDC 7 Fr is put in right renal artery. GW all-star cross lesion and put distal renal artery. Cine shows step true position GW at distal renal artery and stenosis 90-95% proximal right renal artery. Revascularization started with pre dilatation with NC Trek balloon 4.0x12 mm with pressure 16 ATM. Cine again showed stenosis 80-90% proximal right renal artery. Procedure continue to insert stent Herculink 7.0x18 at lesion. Stent deployed with pressure 11 ATM and cine show still residual stenosis 10-20%. Post dilatation with same PTCA Balloon with pressure 14 ATM. Cine were showed no complication, no dissection, and no residual stenosis. During procedure heparin 5000 IU (Target AACT 250) was given.

After Procedure, she shifted to high care unit for observation of post procedure complication. During 48 hours, she have no complication as renal failure, shock and infection.

### LEARNING POINTS OF THE PROCEDURE

We have found these cases unintentionally because the initial procedure perform coronary angiography in patients with stable angina who have a positive treadmill test. But we see this patient had indications renal angiography by SCAI guidelines that this patients had resistant hypertension.<sup>3</sup> Caused of that we decide do coronary and renal procedures. Angiography showed normal coronary artery and significant stenosis 90-95 % proximal renal artery and single kidney. We have decided to renal stenting. During and after procedure no complication occurs.

Learning points of this case, if patient have indication of renal angiography, it should be done because many center didn't do renal angiography. Although management with renal stenting is still controversial like research ASTRAL, EMMA, SNRASCC.<sup>3,4</sup> These research showed still unsatisfactory results. Now ongoing research is namely CORAL Trial that gives hope, show positive expectations for the renal stenting.<sup>5</sup> Because of these different it would be nice for these patients performed renal stent remember this patient has only one kidney and had significant renal stenosis.

Based on epidemiological data, this case had single kidney, renal artery stenosis (RAS) and resistant hypertension. Atherosclerosis and Fibromuscular dysplasia (FMD) are the two primary pathologic etiologies of RAS.<sup>8</sup> Fibromuscular dysplasia accounts for about 10% of all RAS cases.<sup>5,6</sup> Several journal mention stenting in renal artery stenosis can decrease blood pressure, improve management of refractory hypertension, and to preserve or improve renal function.<sup>3,5-7</sup>

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