



## “YOUNG LADY WITH RENAL ARTERY STENOSIS- A CASE REPORT ”

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**ABSTRACT** Renal artery stenosis (RAS) is one of the most common causes of secondary hypertension. It is often indistinguishable from essential hypertension. Atherosclerosis is responsible for a significant proportion of cases of RAS while fibromuscular dysplasia (FMD) contributes to a small minority. In this case, a young female presented with unprovoked retinal hemorrhage and hypertension. Upon evaluation, she was found to have severe left RAS and mild right RAS. A left renal artery stenting was done and her blood pressure normalized following the procedure. Through this case, we would like to highlight the importance of evaluating and treating the secondary causes of hypertension, especially in young individuals with symptoms of severe hypertension.

**KEYWORDS :** Retinal hemorrhage, Hypertension, Renal artery stenosis, renal angioplasty with stenting, a case report

### INTRODUCTION:

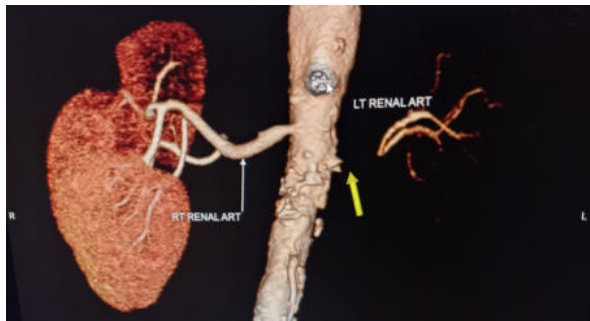
Hypertension due to RAS can occur due to either unilateral or bilateral narrowing of renal arteries. It can lead to renal insufficiency, pulmonary edema, recurrent heart failure, acute coronary syndrome, and retinal complications.<sup>[1,2]</sup> Diagnosis can be made using renal Doppler, computed tomography angiography(CTA), magnetic resonance angiography(MRA), or selective angiogram.<sup>[1]</sup> Revascularization can be done in appropriate patients based on lesion severity.<sup>[3]</sup>

### Case Report:

This 20-year-old female medical student had a history of unprovoked retinal hemorrhage, three months back. She underwent laser therapy for the same in the previous hospital. On routine follow-up, she was found to have elevated angiotensin-converting enzyme (ACE) levels. She was referred to our hospital for further care.

On examination, the patient was conscious and oriented. Her vital data was normal except for an elevated blood pressure of 140/110mmHg. She had no history of hypertension. Her systemic examination was unremarkable. Her baseline investigations revealed a slightly elevated erythrocyte sedimentation rate (ESR) and her kidney function tests were within normal limits. She was started on antihypertensive and secondary causes of hypertension like renal artery stenosis and pheochromocytoma were investigated. Her urinary spot vanillylmandelic acid level was normal.

Since the clinical suspicion of RAS was high, a renal artery Doppler was done and it showed suspected left RAS. Further testing with CT renal angiography confirmed severe left RAS and mild right RAS (see Figure 1). A left renal artery angioplasty with stenting was done after taking informed consent. Post-procedure, the patient was symptomatically better. She had normal renal functions and she was able to maintain normal blood pressure without any medications.



**Figure 1**

Figure 1 shows severe left renal artery stenosis and mild right renal artery stenosis in CT renal angiography.

### DISCUSSION

Hypertension due to secondary causes accounts for 5-10% of all cases of hypertension.<sup>[4]</sup> Atherosclerotic renal artery stenosis (ARAS) is the most common secondary cause of hypertension.<sup>[2]</sup> Almost 90% of all cases of RAS are due to atherosclerosis. Fibromuscular dysplasia, Takayasu's arteritis, renal artery dissection, radiation fibrosis, and renal artery obstruction from aortic endovascular stent grafts constitute a small minority of cases of RAS.<sup>[4]</sup>

ARAS is usually observed in patients with atherosclerosis of any other vascular bed. This has been reiterated by studies in patients with coronary artery disease and peripheral vascular disease.<sup>[2]</sup> 'String of pearls' appearance in angiography should raise suspicion of FMD. It is a congenital condition with potential for flow-limiting obstruction with predominant involvement of carotid, femoral, and visceral arteries and with female preponderance.<sup>[2]</sup> Patients with RAS may present with unexplained severe hypertension, acute or chronic kidney disease, flash pulmonary edema, and retinal hypertensive complications.<sup>[4]</sup> A few authors have reported retinal and vitreous hemorrhages, tractional retinal detachments, and retinal neovascularization in patients with fibromuscular dysplasia.<sup>[5]</sup> Retinal hemorrhage, as observed in this patient, could have been secondary to accelerated hypertension or retinal manifestation of fibromuscular dysplasia.

On evaluation, patients may have an unexplained elevation of creatinine, asymmetric kidney disease in the background of chronic kidney disease, hyporeninemic hyperaldosteronism, and hypokalemia. The onset of AKI after initiation of RAAS inhibitors (ACE inhibitors or angiotensin receptor blockers (ARB)) should raise the suspicion of hemodynamically significant renal artery disease.<sup>[4]</sup>

Renal Doppler ultrasound is usually the initial investigation for screening of RAS. It provides useful information regarding location, severity, renal resistive indices, and renal dimensions, but is often less sensitive for identifying collaterals.<sup>[3]</sup> Renal arteriography is the gold standard investigation for the diagnosis of renal artery stenosis.<sup>[4]</sup> Other modalities like CT angiography and MR angiography are also found to be useful. In our patient, CT angiography was done and it showed severe left renal artery stenosis and mild right renal artery stenosis.

For patients with ARAS, aspirin, cholesterol-lowering drugs, aggressive control of diabetes, antihypertensive therapy, and smoking cessation are essential to limit atherosclerosis. Renal stenting is known to 'cure' hypertension in patients with RAS due to unifocal FMD and outcomes are comparatively poor in patients with multifocal FMD, systemic FMD, and ARAS. Perioperative mortality, renal failure, and risk of death within four years after renal stenting are significantly low if revascularization is done before serum creatinine is elevated.<sup>[3]</sup> In our patient, left renal angioplasty and stenting were done prior to any elevation of serum creatinine and she showed a good response.

We conclude that a search for treatable causes should always be thought of, investigated, and treated, especially in young patients with severe hypertension. This will improve the quality of life and reduce the risk of hypertensive complications.

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**Conflict Of Interest-** None

**Ethical Approval-** Not required

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