



INDIAN SOCIETY OF HYPERTENSION



## Case Report

# Isolated Unilateral Renal Artery Stenosis in Young Female with Takayasu Arteritis: Case Report

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### Abstract

Vasculitis as a cause of renovascular hypertension is not uncommon. However, isolated involvement of the left renal artery without affection of other vascular beds is extremely rare in any vasculitis, including Takayasu arteritis. Here, we present a case of a young girl with resistant hypertension and recurrent flash pulmonary edema secondary to renal artery stenosis (RAS). The cause of the RAS was vasculitis probably Takayasu arteritis. She was managed with immunosuppression with endovascular intervention.

**Key words:** Secondary hypertension, Takayasu arteritis, renal artery stenosis

### Introduction

Secondary hypertension affects a small but significant number of the hypertensive population and, unlike primary hypertension, is a potentially curable condition. About 5–15% of patients with hypertension have a secondary cause.<sup>[1]</sup> Hypertension in the young population is associated with increase adverse cardiovascular outcomes. Renal artery stenosis (RAS) is one of the most common causes of secondary hypertension. Recurrent flash pulmonary edema is a strong indication for the evaluation of the renovascular cause of hypertension.

Common causes of RAS are atherosclerotic, fibromuscular dysplasia (FMD), or Takayasu arteritis. Among, Takayasu arteritis and FMD are common culprit in a young female.

Here, we present a case of isolated involvement of renal artery in young female of Takayasu arteritis, who presented to us with recurrent flash pulmonary edema. She was managed with stenting of renal artery. Isolated involvement of renal artery in Takayasu arteritis is extremely rare. This is first case report of isolated involvement of Takayasu arteritis in young female to the best of our knowledge.

### Case Report

A 21-year-old non-obese, girl with a no family history of hypertension, and no other risk factors for hypertension such as

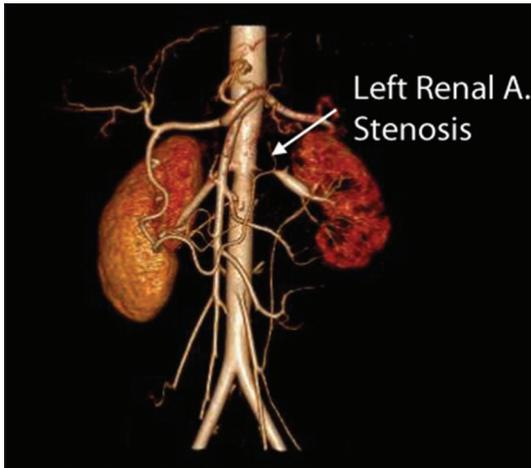
obstructive sleep apnea and obesity, caffeinated drugs, or polycystic ovary syndrome was recently diagnosed with hypertension by primary care provider. She was on three antihypertensive drugs including diuretics. She presented to us with sudden onset of Class IV dyspnea. On examination, she was having tachycardia with heart rate of 142 bpm. Sp<sub>o</sub><sub>2</sub> was 86% on room air and blood pressure (BP) of 176/112 mm Hg. Respiratory system examination revealed tachypnea with bilateral crepitation. Electrocardiography was unremarkable except for sinus tachycardia. On 2D-echo her left ventricle (LV) function was 25% with global LV hypokinesia. She was stabilized with IV diuretics and non-invasive ventilator support. After stabilization, she had another episode of pulmonary edema on 3<sup>rd</sup> day of hospitalization. In view of young hypertension and recurrent flash pulmonary edema, we suspected renovascular etiology. On blood investigation, her Hb was 12.3, total count 12,300, platelets 3.2 lac, serum creatinine 0.7, serum potassium 4.2, and serum sodium 142. She had high plasma renin activity (>24) and high aldosterone level. Erythrocyte sedimentation rate (ESR) was 112 and C-reactive protein (CRP) was 98. Ultrasonography abdomen showed asymmetrical kidney size. Computerized tomography angiogram revealed diffuse thickening and enhancement of aortic wall and its major branches along with critical narrowing of ostium of left renal artery [Figure 1]. Atherosclerotic RAS is extremely unknown at this age. We put two differential diagnosis, one is unifocal FMD and other is

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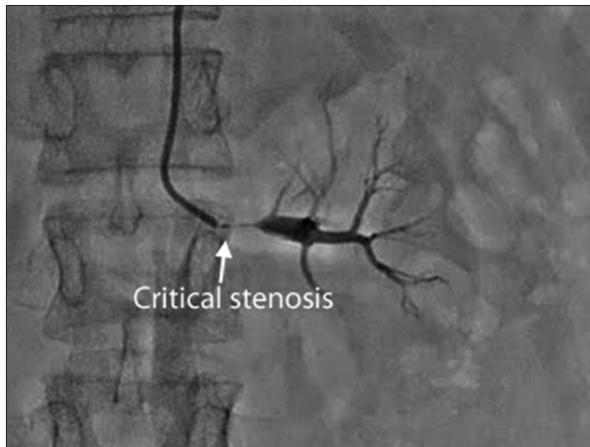
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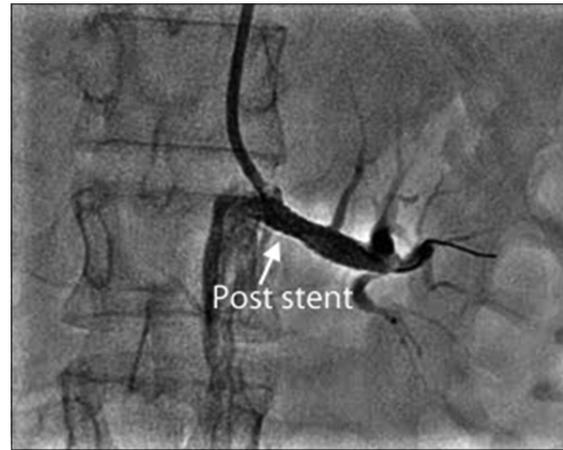


**Figure 1:** Computed tomography angiogram revealed diffuse thickening and enhancement of aortic wall and its major branches along with critical narrowing of the ostium of left renal artery



**Figure 2:** Selective angiography showed critical stenosis of the left renal artery

Takayasu arteritis. High inflammatory marker such as ESR and CRP and diffuse thickening and enhancement of aorta and its major branches on imaging were suggestive of inflammatory vasculitis. Other causes of vasculitis were ruled out. Hence, we put the diagnosis of Takayasu arteritis with isolated RAS. She was put on oral steroid after rheumatological consultation. Marker of inflammation became normal; we took patient for endovascular intervention. Selective angiography showed critical stenosis of left renal artery [Figure 2]. We did stenting for renal stenosis [Figure 3]. Post-procedure patient was stable. Her BP comes within normal range. She improved of her symptoms, and her LV function too improved 2 weeks after intervention. She was discharged from hospital in hemodynamic stable condition. On follow-up examination, after 6 weeks she was asymptomatic with normal BP on single antihypertensive medicine. This is extremely rare presentation of isolated RAS in a case of vasculitis probably Takayasu arteritis.



**Figure 3:** Post-endovascular intervention result in the left renal artery

## Discussion

About 5–15% of patients with hypertension have a secondary cause, which may be treatable with a specific intervention.<sup>[1]</sup> RAS is one of the most important causes of secondary hypertension and affects 1–5% of all hypertensive patients.<sup>[2]</sup> Atherosclerosis and FMD are the most common etiologies; less frequent causes of RAS are Takayasu arteritis.<sup>[3]</sup> Diagnosis of Takayasu arteritis can be made in a patient with both suggestive clinical findings (e.g., constitutional symptoms, hypertension, diminished or absent pulses, and/or arterial bruits) and imaging showing narrowing of the aorta and its primary branches. While FMD dysplasia is diagnosed by classical beaded appearance on angiography, there are two subtypes of FMD, unifocal FMD and multifocal FMD.

Although renal involvement in Takayasu arteritis is not rare, isolated involvement of single renal artery without the involvement of other large vessels is extremely rare, here we have presented a case of isolated RAS with recurrent flash pulmonary edema due to vasculitis probable Takayasu arteritis. She was managed with anti-failure treatment, steroid, and endovascular intervention for RAS. She had improved her symptoms and doing well in follow-up.

Although secondary hypertension has number of causes, certain clinical clues help us to suspect renovascular etiology. Young age of onset, drug-resistant hypertension, recurrent flash pulmonary edema, asymmetrical kidney size on ultrasound, and high plasma renin activity, are important clues which help to suspect renovascular cause of hypertension.<sup>[4]</sup> Diagnosing the cause of secondary hypertension is extremely important as they can be potentially treated.

## Conclusion

Renovascular hypertension is one of the very important treatable causes of hypertension. RAS should always be suspected when there are specific clues to that. Renal

artery involvement in Takayasu arteritis is not uncommon; however, isolated involvement of the unilateral renal artery is extremely rare in any vasculitis, including Takayasu arteritis. This case is unique in the sense that isolated left renal artery is critically affected in young woman with vasculitis probable Takayasu arteritis without the involvement of other vascular beds.

### Clinical Significance

Secondary causes of hypertension should always be sought in young patient with hypertension. Among all causes of secondary hypertension renovascular hypertension are most common one. Recurrent flash pulmonary edema is strong clue for renovascular hypertension. In our case, young girl with vasculitis (Takayasu arteritis) has very unusual presentation of isolated unilateral RAS without any apparent involvement of other vascular beds. However, imaging evidence of affection of aorta and its major branches was there. High index of suspicion is the key to diagnose renovascular hypertension with vasculitis.

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