

Renal Artery Stenosis Complicated by Thoracic Aortic Dissection: A Case Report

Anthony Gikonyo¹, Khalif Mohammed², Bob Kikwe³, Isaac Adembesa⁴, Shrikant Panchal⁵, Daniel Gikonyo⁶, Premanand Ponoth⁷

Authors Affiliation:

^{1,6}Cardiologist ^{2,3}Medical Officer

^{4,5}Cardiac Anaesthetist

⁷Cardiothoracic Surgeon, The Karen Hospital, PO Box 74240-00200 Nairobi, Kenya.

Corresponding Author:

Anthony Gikonyo, Cardiologist, The Karen Hospital, PO Box 74240-00200 Nairobi, Kenya.

E-mail: anthony.gikonyo@karenhospital.org
pponoth@gmail.com

Received on 07.12.2018

Accepted on 19.12.2018

Abstract

Renal artery stenosis is an uncommon presentation of secondary hypertension. We present a case of bilateral renal artery stenosis complicated by thoracic aortic dissection. The patient underwent successful thoracic endovascular repair and bilateral renal artery stenting.

Keywords: Renal Artery Stenosis; Aortic Dissection; Hypertension; Endovascular Repair; Renal Artery Stenting.

Background

The prevalence of hypertension in Kenya can be estimated at 22.8%. The current prevalence of secondary hypertension is not well documented. One of the causes of secondary hypertension is renal artery stenosis due to either atherosclerosis or fibromuscular dysplasia. Secondary hypertension due to renal artery stenosis is a relatively uncommon disease. In cases of hypertension due to signs of renal impairment related to renal arterial fibromuscular dysplasia, balloon angioplasty with bailout stenting should be considered [1]. We described our initial experience of renal artery stenting in a previous case report and now present a different complication of secondary hypertension due to bilateral renal artery stenosis.

Material & Methods

Eighteen (18) year old male was referred with history of uncontrolled blood pressure and chest pain. He was diagnosed with hypertension a few years ago and was currently on Amlodipine

5mg one tablet daily, Losartan H (50/12.5) one tablet daily and Carvedilol 6.25mg one tablet daily. Physical examination was significant for a blood pressure of 167/102mmHg. Computed Tomography (CT) aortogram performed to exclude secondary causes of hypertension showed thoracic aortic dissection and bilateral renal artery stenosis. The CT aortogram was analyzed to determine stent size and ensure adequate proximal and distal landing zone. The procedure was performed via a bilateral femoral artery cut-down, Terumo exchange wire advanced to ascending aorta with diagnostic 5Fr JR4 catheter. Exchanged JR4 for 5Fr pigtail catheter, power injection performed with 30ml of 50% contrast at 30ml/s at 400psi. Left subclavian marked and descending aorta outlined on screen with erasable marker. Image intensifier and patient kept in same position, Amplatz stiff wire positioned with pigtail catheter, followed by Valiant Captiva 30x30x157 mm Thoracic Endovascular Aortic stent deployment. Further power injection of renal arteries performed, Renal Double Curve guide catheter with Terumo exchange used to cannulate renal arteries. Balloon angioplasty with Admiral Xtreme 6x20mm balloon to right then deployment

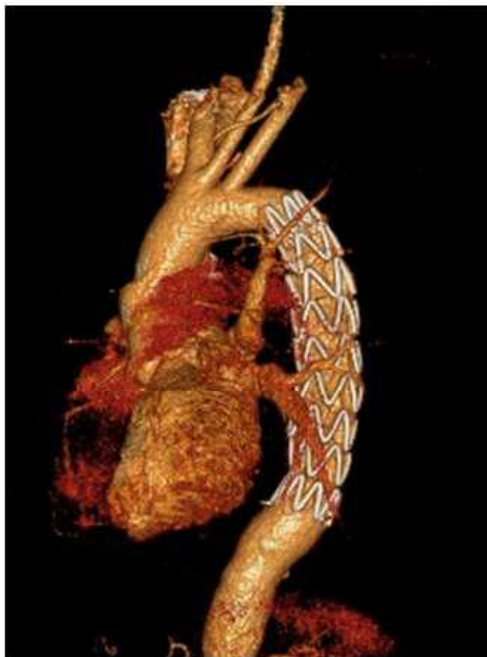


Fig. 1: CT Aortogram of Thoracic Endovascular Stent for Descending Aortic Dissection

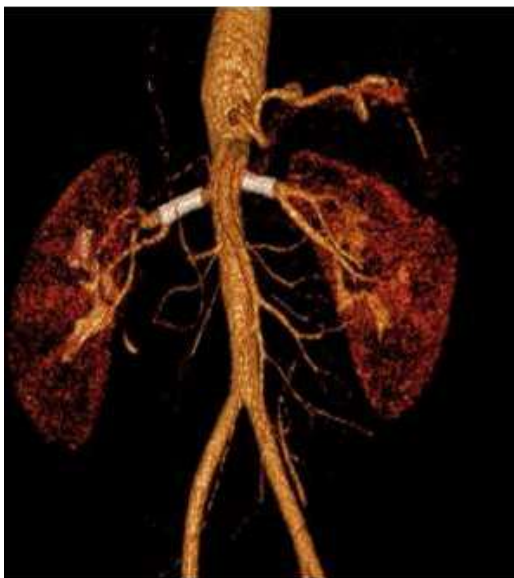


Fig. 2: CT Aortogram of bilateral Renal Artery Stents

of Hippocampus 6x20mm stent. Similar procedure to left with 6x20mm Hippocampus stent. Patient discharged 3 days post procedure.

Discussion

The occurrence of renal artery stenosis and type B aortic dissection may appear rare. However from our literature review we found a retrospective



Fig. 3: CT Aortogram of TEVAR and bilateral Renal Artery Stents

analysis of the prevalence of renal artery stenosis in 63 consecutive patients with aortic dissection who underwent thoracic and abdominal aortography. Ten patients (16%) had renal artery stenosis. One patient with a type B dissection underwent emergent percutaneous renal artery angioplasty, which successfully controlled the hypertension, resulting in an excellent clinical outcome. They further concluded that angiography should be routinely performed on patients with aortic dissections to evaluate for renal artery stenosis [2].

Bilateral renal artery stenting provides a beneficial outcome such as stabilization of renal functions, significant improvement in blood pressure control and reduction in the number of oral antihypertensive medications at follow-up [3]. Renal artery stenting is a cost effective approach in properly selected patients of renal artery stenosis with hypertension [4]. If revascularization is envisaged careful patient selection, e.g. patients with refractory hypertension or progressive renal failure, is important to maximize the potential benefit [5].

Randomized controlled studies (RCTs), including a large one (CORAL trial), although heavily criticized, have not provided evidence in favour of revascularization. Although RCTs are rather neutral, a multitude of prospective, observational cohort studies, comparing the outcomes of patients after Percutaneous Renal Artery Angioplasty/Stenting (PRA/S) have demonstrated significant improvement in systolic and diastolic BP in about two thirds and improvement and/or stabilization in renal function in 30-40% of patients undergoing PRA/S. Nevertheless, the issue remains unsolved and a subject of future studies for furthermore definitive settlement [6]. Future studies incorporating potential procedural improvements and that include patients more likely to benefit from renal stenting than were included in ASTRAL and CORAL are needed to more carefully examine specific patient subgroups [7].

A more recent review of the International Registry of Acute Aortic Dissection (IRAD) demonstrated that patients with refractory hypertension had a greater than 20-fold increase in mortality when managed with medical therapy alone. Refractory pain was also identified as a predictor of dismal outcome with isolated medical management having an in-hospital mortality rate of 35.6%. Thoracic Endovascular Aortic Repair (TEVAR) is now considered first-line therapy for those patients with suitable anatomy. In stable patients who are not suitable candidates for endovascular therapy, transfer to a high-volume aortic centre should be considered a viable option as results in this setting may rival that seen with less invasive options [8].

Given these results, TEVAR is considered as the gold standard for complicated Type B Aortic Dissection (TBAD), and current guidelines recommend TEVAR for patients with complicated TBAD as Class I indications. Complicated TBAD is defined by the presence of at least one of the following: aortic rupture, persistent or recurrent pain, uncontrolled hypertension despite full medication, and early aortic expansion and malperfusion in cerebral, spinal, visceral, renal, or peripheral vascular territories. These complications are considered to be a major cause of early mortality in patients with TBAD [9]. A state-wide study on survival after acute uncomplicated type B aortic dissection (UTBAD) shows an independent survival advantage for TEVAR over medical therapy. These data add further evidence for a paradigm shift in acute management of type B dissection in favour of early TEVAR [10].

Conclusion

Renal Artery Stenosis is an uncommon presentation of hypertension. Adequate investigation to exclude secondary hypertension is essential to proper management of patients. Left untreated the complications of secondary hypertension can be life threatening. Early diagnosis and treatment may prevent these complications.

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