ABSTRACT: Aorto-ostial lesions are typically some of the most difficult to treat because of the unique challenges they pose such as difficulty in visualizing the ostium; geometric mismatch of a cylindrical stent being placed into a funnel-shaped anatomy; and re-crossing difficulties due to stent damage or migration, guide wire entanglement in stent struts, and stent protruding into aorta. We report the use of a dedicated ostial balloon that flares the stent ostium to treat an aorto-ostial renal stenosis, alleviating some of these challenges at the time of stent deployment.

CASE REPORT
An 82-year-old female with past medical history of uncontrolled hypertension, carotid artery disease, peripheral arterial disease, solitary functional kidney, and chronic left ventricular dysfunction presented with progressive shortness of breath and hypertensive urgency. Vital signs on admission revealed blood pressure of 184/92 and laboratory analysis was unremarkable with preserved renal function. She underwent coronary angiography, which showed moderate multivessel coronary artery disease and was directed for medical management. Renal angiogram, in the setting of refractory hypertension and solitary functional kidney, confirmed 80% left aorto-ostial renal artery stenosis and diminutive right renal artery with atrophic nephrogram.

An 8 Fr RDC guide (Boston Scientific) was used to selectively engage the left renal artery. Selective angiogram of the left renal artery confirmed severe stenosis with a 20 mm Hg gradient across the lesion (Figure 1). We advanced a Grand slam wire (Abbott) across the lesion into the distal renal artery (Figure 2) and used a Sterling 6 x 20 mm balloon (Boston Scientific) to predilate the ostium at 10 atm, with good expansion (Figure 3). We then deployed an Express 6 x 18 mm stent (Boston Scientific) at the ostium at 12 atm (Figure 4). We used a Flash 6 x 19 mm ostial balloon (Ostial Corporation) to preferentially dilate the ostium of the stent at 8 atm (Figure 5). Subsequently, the Sterling 6 x 20 mm balloon was used to dilate the remainder of the stent at 10 atm with good expansion. Final angiograms revealed good results in the left renal artery, with brisk
flow and adequate expansion (Figure 6).

**DISCUSSION**

Renal artery stenosis (RAS) is a common manifestation of generalized atherosclerosis whose clinical importance is increasingly being recognized. The interaction between coronary and renal atherosclerosis is complex, sharing common risk factors and a similarly insidious progression. Coronary disease and its treatment frequently exacerbate renal function, whereas renal disease accelerates coronary atherosclerosis and causes resistant hypertension by stimulating the renin-angiotensin system. RAS thus represents the most common cause of secondary hypertension, affecting at least 5% of the general population and as many as 30%-40% of patients undergoing cardiac catheterization. Harding and colleagues showed similar results in terms of concomitant coronary artery disease and RAS. In the same study, patients with 1-vessel disease had 10% incidence of RAS; those with 2-vessel disease had 20% incidence; those with 3-vessel disease had 30% incidence; and those with left main disease had 40% incidence of RAS. Stack also found that the survival rate was significantly worse for patients who had coronary artery disease if they had concomitant RAS greater than 50%. Even when adjusted for standard prognostic factors, RAS was an independent risk factor for death in patients with coronary artery disease.

Treatment of aorto-ostial RAS has been associated with lower procedural success and higher complication and restenosis rates, as compared to non-ostial lesions. The design and delivery of currently available balloon and stent systems in ostial lesions can result in inaccurate stent positioning and placement, leading to stent protrusion into the parent vessel lumen or geographic miss. Some of these difficulties can be eliminated using the Flash ostial balloon. First, by partially inflating the proximal locator balloon, the system is advanced and the catheter held at the ostium. The distal balloon is then inflated to ensure appropriate apposition of the stent within the renal artery. Finally, the proximal locator balloon is completely inflated to flare the ostium of the stent and provide complete ostial coverage.

The Flash ostial balloon allows selective ostial flaring while ensuring complete ostial coverage, as illustrated in the case herein.

**Editor’s Note:** Disclosure: The authors...
have completed and returned the ICMJE Form for Disclosure of Potential Conflicts of Interest. Dr. George reports consultancy for Boston Scientific. Dr. Desai reports no conflicts regarding the content herein.


Address for correspondence: Jon C. George, MD, Director of Clinical Research, Division of Cardiovascular Medicine, Deborah Heart and Lung Center, 200 Trenton Road, Browns Mills, NJ, 08015, USA. Email: georgej@deborah.org

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Figure 6. Renal angiogram post-ostial flaring (arrows) (A). Final left renal artery angiogram post-intervention (B).