



DOUBLE BALLOON TECHNIQUE FOR BIFURCATION FLARING OF A COVERED CP STENT IN THE SETTING OF SEVERE COARCTATION OF THE AORTA

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History and physical:

Patient is a 29-year-old man followed for hypertension, hyperlipidemia, and a strong family history of early coronary artery disease. He began experiencing fatigue, exercise intolerance, and shortness of breath which initiated a comprehensive evaluation. Physical exam was notable for a 50-mmHg upper to lower extremity cuff gradient, normal S1 and S2, and a 3/6 systolic murmur heard best over the left infraclavicular area. A CTA performed to rule out coronary atherosclerosis incidentally identified a bicuspid aortic valve and severe coarctation of the aorta. He was subsequently referred to our program for arch intervention.

Imaging:

CTA demonstrated severe coarctation of the aorta with near interruption at level of distal aortic arch/proximal descending aorta, narrowing begins just distal to the left subclavian artery (LSCA) (Figure 1A). Based on the CTA we anticipated the need to cover the vessel beginning at the origin of the LSCA, which would obligatorily result in covered stent material partially impeding flow across the transverse arch.

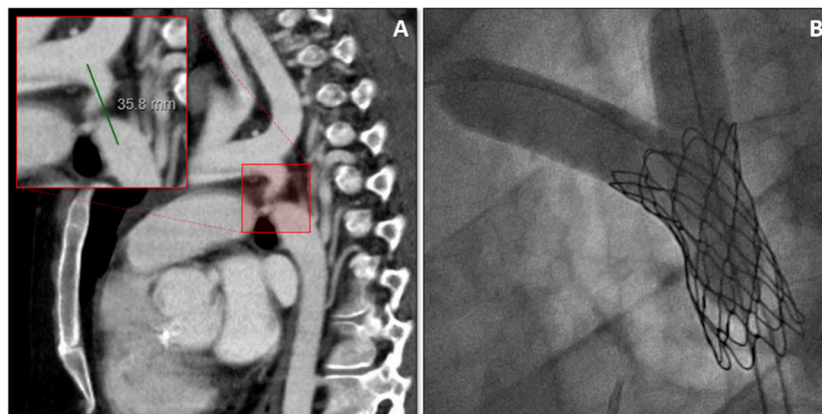
Indication for Intervention:

Severe coarctation (near atresia) of the aorta, systemic hypertension, progressive exercise intolerance and shortness of breath.

Intervention:

Angiography performed using a transeptal/prograde approach from the right femoral vein confirmed there was near atresia of the descending thoracic aorta. The patient experienced hemodynamic instability with a prograde catheter *in situ* so this was withdrawn, using a 0.014" CHOICE wire we were easily able to cross lesion retrograde and establish wire position in the LSCA. The tract was serially dilated up to 7mm with repeat angiography demonstrating improved flow and evidence of wall injury. The sheath was exchanged for a 14F x 85cm D'Vill and a 16mm x 4.5cm Covered CP Stent was advanced into position and deployed across the lesion. Repeat angiogram demonstrated interval resolution of the arch obstruction with the stent partially obstructing the transverse arch and proximal LSCA, as expected.

To flare the distal stent and avoid obstruction by the covered cells, a second wire was placed through the 14F sheath and positioned in the ascending aorta. Two 12mm x 4cm Tyshak II balloons were introduced over the wires. The shoulder of the balloon in



the transverse arch was in the proximal stent and the shoulder of the balloon in the left subclavian artery terminated in the mid stent. Both balloons were inflated to 3.5 atm, equalling an effective dilation to 19.6 mm in the proximal stent (Figure 1B). We intentionally avoided over-dilation at the site of the lesion.

Learning Points of the Procedure:

Due to arch anatomy and the location of CoA it was not possible to deploy a covered stent without partially obstructing flow across the distal transverse arch or LSCA. With a single 14F sheath we were able to simultaneously inflate two 12mm balloons which effectively brought the covered material flush with the transverse arch, and with complete apposition along the posterior surface of the LSCA.

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