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## A Novel Technique for Stenting Pulmonary Artery and Conduit Bifurcation Stenoses

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### Introduction:

Despite advances in endovascular stent materials and techniques, pulmonary artery bifurcation stenosis remains a challenging lesion. Congenital heart disease requiring a right ventricle to pulmonary artery conduit can present with either distal conduit or proximal bifurcation stenosis. These lesions are difficult to treat without surgery. Previous techniques include "kissing stents" or stenting of the major vessel, whilst straddling the smaller vessel. We describe a novel technique where a single stent is mounted on two angioplasty catheters. This stent is delivered using a large Mullins sheath on two guidewires, one in each of the bifurcating vessels.

### Methods:

A superstiff guidewire was placed in the larger of the two bifurcating vessels. A wide bore Mullins sheath is advanced just proximal to the stenosis. A standard exchange wire is placed in the adjacent vessel using a 5 French right Judkins catheter. Both EV3 and CP stents were used because of limited foreshortening characteristics. The stent was crimped manually over the two angioplasty catheters. The catheters were advanced over respective guidewires through the Mullins sheath and into the branching vessels. Test angiograms through the side arm of the Mullins confirmed stent position before simultaneous balloon inflation to produce flaring of the stent. Nine patients (mean age 13.2 (6.7-23.4) years, mean weight 43.1 (23-69) kg) had a bifurcation stenosis treated using this technique between 2003 and 2010. Outcome measures were reduction of gradient, ratio of right to left ventricular pressures, procedural complications and need for re intervention.

### Results:

There were no significant complications during the procedure. The pressure gradient across the stenosis was reduced from 34 (23-52) mmHg to 11 (8-15) mmHg ( $p < 0.05$ ). Right ventricular to left ventricular pressure ratio decreased from 0.81 (0.55-0.95) to 0.42 (0.35-0.50) ( $p < 0.05$ ). No patients have required re-intervention or surgery over a median follow up of 2.6 (0.2-6.7) years.

### Conclusions:

This technique appears to be safe and effective for selected cases with bifurcation stenosis. It significantly reduces the risk of jailing side branches and the risk of intimal damage from using one oversized balloon. It should be considered a valuable adjunct in the catheter treatment of conduit stenosis.

