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Extended application of the Amplatzer Vascular Plug II for elongated arterial duct occlusion

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Introduction: Although used very successfully in the majority of attempted transcatheter arterial duct occlusions, the St. Jude ADO 1 is less suitable for elongated or complex arterial ducts as the aortic retention disc must distort to allow safe capture of the narrowest diameter. We aim to describe the use of the St. Jude, Amplatzer Vascular Plug (AVP) II for patients with significant arterial ducts in 2 UK centres.

Methods: From September 2013 to October 2015 a total of 35 patients (24 female) underwent attempted duct occlusion using the AVP II. The median age was 1.3 years (range 0.46-14.5) and median weight 9.25 kg (range 4-54). 17 patients were symptomatic with tachypnoea ± failure to thrive and in 21 patients the left ventricular end diastolic dimension z score was over 2. Using angiography, the median narrowest diameter was 3 mm (range 1.2-7.2) and median length was 12.5 mm (range 6.2-21). Krichenko duct shapes were A (n=1), C (n=3), D (n=8) and E (n=23). Fourteen implantations were via an antegrade approach and the remainder retrograde.

Results: Sizes of AVP II devices (diameter times unconstrained length) employed were 6 x 6 (n=11), 8 x 7 (n=21) and 10 x 8 (n=3). There were 2 complications, in one patient the device migrated to the left pulmonary artery and was successfully retrieved before successful ADO 1 implantation. In a further patient, the AVP II appeared unsatisfactory before release and was retrieved before an ADO 1 was implanted which subsequently migrated requiring surgical retrieval. In all other patients implantation was successful with complete duct occlusion and no disturbances to flow in the left pulmonary artery and aorta.

Conclusions: The morphology of the arterial duct must be carefully considered before selecting a suitable device. In elongated and complex ducts, the AVP II performs well and should be considered as a first line device.