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Transcatheter closure of Tubular (Type C) PDA's in Patients with Pulmonary Hypertension

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Introduction: There are known groups of patients with patent ductus arteriosus (PDA) where transcatheter occlusion is technically more challenging. Among these are infants with large PDAs and older patients with tubular PDAs (type C). In this report, we will present our experience in transcatheter closure of Type C PDA's.

Method: Between 2005-2016, 872 patients underwent transcatheter PDA closure in our clinic. 40 of them had Type C PDA.

Results: The median age was 8 months (range 1 month to 6.5 years). The age groups were as follows: <1 year, 29/40 patients (73%); 1–2 years, 9/40 (22%) and >2 years 2/40 (5%). Median weight was 5.9 kg (range 3–15) with 53% of patients weighing less than 6 kg. The median measurements for minimal ductal diameter, length, and aortic ampulla were, 4.7 mm (range 3–11.7), 11 mm (4.3– 24), and 7.7 mm (4–14), respectively. Pulmonary hypertension was found in all. PDA was closed with Duct occluder I (DOI) in 31, vascular plug (VP) 2 in four, VP I in two, VP4 in one, DO II in one and DO II AS in one. Procedure was successful in 37/40 (93%). Two patients sent to surgery after embolization of VP I and DOI. Significant aortic obstruction occurred before releasing the DOI device in another. Device displaced to descending aorta after 24 hours and repositioned with a biopptome in one. Occlusion rate was 100% after six month follow up. DOI slightly protrude to aortic lumen without significant obstruction in 13/31 infants. In these peak velocity at descending aorta decreased at follow up.

Conclusion: Although technically challenging, transcatheter closure of large Type C PDA especially in infants with various devices is possible. It is important that the skirt of the device to be embedded into the duct for a more stable position. In a relatively small aorta, a larger aortic retention skirt diameter of DOI is one clinical concern; however, the somatic growth of aorta allows unimpeded aortic flows on late follow-up. In order to prevent aortic obstruction, plugs can be used to occlude the long Type C PDA especially in infants.