

Reducing shunts in congenital heart disease: gentle telescoping pigtail technique for device delivery

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Introduction: AMPLATZER(TM) Vascular Plug II and IV are well-established to reduce collateral flow via superfluous arterial and venous connections associated with congenital heart disease (CHD). However, it can sometimes be challenging to access the target lesion and deliver the optimal device. Compared to the Plug IV, the Plug II is sometimes preferable due to its shorter length, flat profiled retention disks and availability of large diameters, but its profile means the preferred delivery catheter needs a larger inner lumen. In this respect, we present a new simplified telescoping technique for Plug II delivery.

Methods: Retrospective analysis of all CHD patients who underwent a vascular occlusion procedure with Plug II/IV between 12/2012 and 12/2015. Target blood vessels were characterized, measured, and the size and number of implanted devices registered and device-to-vessel diameter-ratio calculated. The refined telescopic technique for Plug II delivery worked by probing the target vessel with a floppy wire, which was simply reinforced by the curved tip of a standard pigtail catheter at the proximal vessel-segment to guide the needed delivery sheath/catheter. Deployment technique, complications and procedural results were documented.

Results: 59 patients with median age and bodyweight of 3.0 years (range 37 days – 75 years) and 13.8 kg (range 2.5 –80 kg) were treated. 37% of the cohort had a bodyweight ≤ 10 kg. 106 devices (30 Plug II, 76 Plug IV) were implanted in 93 target vessels. Major indications for their use were ductus arteriosus (19%), aorto-pulmonary collaterals (43%) and venous collaterals (34%) and miscellaneous vessels (4%). Complete primary vessel occlusion was achieved in 76% of these patients. In 5 curvy vessels with narrow retention zones, we accomplished vascular occlusion with the Plug II by using our novel delivery technique. No complications occurred.

Conclusion: Collateral-vessel closure via AMPLATZER(TM) Vascular Plug devices is well established, but device-delivery can be challenging in curvy vessels, especially in young children. In this context, we describe a promising, novel and simplified telescopic technique for easy controlled Plug II delivery.