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Novel high-flow microcatheter and large volume dense detachable coils for closing hard to access aberrant arterial vessels in children

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Introduction: Accessing and closing arterial vessels in infants and young children can be challenging due to their acute angle of origin or long tortuous course. Standard catheters are often too thick and stiff for intubation and especially placement of occlusion devices in peripheral position. Furthermore, often only incomplete occlusion of large vessels is achieved.

Methods:

The Lantern Catheter (Penumbra Inc., USA) is a 2.6F high-flow microcatheter that allows for accessing tortuous vessels and placement of dense packing coils (Ruby Coils) to completely occlude aberrant arterial vessels. We report our experience in transcatheter occlusion of hard to access major aortopulmonary collateral arteries (MAPCA) and large, high-flow pulmonary sequestration arteries in three patients using the Lantern Catheter and Ruby Coils.

Results:

Patient 1 is a four-year-old male with uncorrected Tetralogy of Fallot and pulmonary sequestration (PS) of the right lower lobe whose hard to access supplying artery arises from the thoracic descending aorta in an acute angle.

Patient 2 is a 7-year-old male with right lower lobe PS whose large supplying artery arises from the abdominal aorta cranial to the coeliac duct and draining after a tortuous course into the right pulmonary veins.

Patient 3 is five-year-old girl with double inlet left ventricle, s/p Fontan-completion with MAPCAs arising from the right subclavian and costocervical artery.

Despite unsuccessful occlusion during previous catheterizations in two of the patients we were able to close the aberrant vessels successfully in all of them.

Conclusion:

The Lantern Microcatheter and dense packing Ruby Coils are very valuable in closing PS arteries and MAPCAs. This system may become an alternative in infants and young children for closing hard to access, tortuous vessels and large arteries with high blood flow.