Patent Ductus Arteriosus Stenting (Transcatheter Potts Shunt) for Palliation of Suprasystemic Pulmonary Arterial Hypertension: A Case Series

Malekzadeh-Milani S. (1), Patel M. (1), Szezepanski I. (1), Levy M. (1), Bonnet D. (1,2), Boudjemline Y. (1,2)
(1) Centre de Référence Malformations Cardiaques Congénitales Complexes – M3C, Necker Hospital for Sick Children, Assistance Publique des Hôpitaux de Paris, Pediatric Cardiology, Paris, France.
(2) Université Paris Descartes, Sorbonne Paris Cité, Paris, France.

Introduction: Side to side surgical Potts shunt connecting descending thoracic aorta to the left pulmonary artery have been tried in the past for patients with symptomatic severe and refractory idiopathic pulmonary arterial hypertension with right ventricular failure and syncope. The promising results from this surgical technique inspired us to try interventional methods in opening and stenting residual patent ductus arteriosus (PDA) for effective post tricuspid decompression of the pulmonary circuit in patients with chronic suprasystemic PAH who failed multiple medical therapies.

Methods: We look in our database for patients with suprasystemic PAH who underwent PDA stenting to decrease PA pressure.

Results: Three patients were found. All three had successful PDA stenting allowing for equalization of aortic and pulmonary systolic pressure. We chose stent diameter based on our experience of surgical Potts shunt. The criteria we used for selecting initial stent diameter were a compromise between age, “surgical” target diameter and narrowest PDA diameter. Moreover, we chose to gradually enlarge the diameter of the connection and thus flow by sequential balloon inflation with the aim of equalizing the PA and aortic systolic pressures, maintaining pulmonary blood flow and limiting the lowering the desaturation of the inferior limbs. A 6-mm stent was used in the smallest patient and 9-mm stent for the oldest patient. Post dilatation and over-expansion was necessary in one patient. The objectives were obtained with the initial stent in the other two. The saturation in lower limbs decreased as a result. All patients had improvement of their clinical status following the procedure.

Conclusions: The promising results from these cases compelled us to change the approach and protocol for management of patients with suprasystemic PAH. We now do a detailed cardiac catheterization in all patients with suprasystemic PAH to look for a PDA. Even tiny it can be opened by stent insertion to equalize aortic and pulmonary pressure and improve RV function.