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Hypoplastic left heart repair

Daniela Poli, M Saitta, S Agati, L Manuri, P Gitto, E Trimarchi, E Iannace, P Guccione and F S Iorio
Centro Cardiologico Pediatrico del Mediterraneo, Italy

Purpose: The hybrid approach for the treatment of patients with hypoplastic left heart syndrome most commonly includes double approach for transcatheter placement of a stent in the arterial duct via femoral groin and surgical placement of bands on the branch pulmonary arteries via median sternotomy. We present our results of an early single stage procedure for newborns affected by hypoplastic left heart syndrome.

Methods: From October 2011 to September 2014 at Centro Cardiologico Pediatrico del Mediterraneo-OPBG-Taormina, 41 consecutive patients underwent an early single stage hybrid approach procedure for diagnosis of HLHS (23 HLHS, 12 HLHS like, 6 HLHS complex). In 31 cases prenatal diagnosis was available and delivery was attempted in our hospital with ICU back up. All of them received continuous prostaglandins infusion, 17 of them required intubation or inotropic support before procedure. All patients were transferred to Hybrid Cat Lab, monitored by radial artery, central vein catheter, right hand and right foot pulse oxymetry and NIRS. After median sternotomy, the left and right pulmonary were banded by goretex 3 or 3.5 (according to the weight of the patients and size of the pulmonary branches) and then the stent was delivered in the arterial duct via a 7 French catheter positioned in the main pulmonary artery.

Results: All of them were treated during the first 24 hours after birth; median weight was 3.07 Kg (range 1.5 kg to 4.5 Kg). For stenting arterial ductus we used pre-mounted stents in diameter from 7 to 10 and length from 12 to 19 mm Genesis in 5 cases pulmonary arteries banding was performed by 3 mm custom goretex tube, while 3 patients 3.5 mm was used. All patients survived to the procedure. Mean hospital stay length was 19 days (range from 6 to 70 days), mean ICU stay was 11 days (range from 2 to 70 days). Procedural complications occurred in four patients and in one patient was deferred sternal closure. At the median follow up of 90 days, all patients are still alive on medical therapy. Interstage period was characterized by surgical atrial septal defect enlargement in four cases and atrial septal stent was positioned in seven cases and balloon dilatation was performed in three cases. Ductal stenting was not performed in two cases due to excessive diameter of the ductus. In eight cases was performed balloon dilatation of ductal stent and in three cases restenting. Fourteen patients underwent successful comprehensive stage 2 procedure and eleven patients underwent biventricular repair.

Conclusion: In our early experience, single stage hybrid approach for various types of HLHS, demonstrated to be safety and efficacy, with very low morbidity rate. Patients with HLHS are at risk for interstage morbidity and mortality, especially between the first and second stages after the hybrid procedure. A rigorous interstage follow up is mandatory in order to detect potential important anatomical issues regarding dimensions of atrial septal defect, right ventricular systolic function, tricuspid regurgitation, obstruction in the proximal or distal arterial duct, acquired or native retrograde obstruction of the aortic arch. Procedures should be performed in a dedicate cath lab by an experienced team according to an institutional program.

Biography

Daniela Poli is working as senior doctor at Centro Cardiologico Pediatrico del Mediterraneo, Ospedale Bambino Gesù - Taormina, Italy.

polidany@hotmail.com