EARLY SINGLE STAGE HYBRID APPROACH FOR HYPOPLASTIC LEFT HEART SYNDROME: OUR EXPERIENCE.

Manuri Lucia, MD; Agati Salvatore, MD; Saitta Michele, MD; Poli Daniela, MD; Campisi Marcello, MD; Trimarchi Eugenio Santo, MD; Iannace Enrico, MD; Morelli Stefano MD; Pongiglione Giacomo, MD; Guccione, Paolo, MD
Centro Cardiologico Pediatrico del Mediterraneo- Ospedale Pediatrico Bambino Gesù – Taormina - Italy.

Purpose. The worldwide experience of hybrid approach for the treatment of patients with Hypoplastic Left Heart Syndrome (HLHS) or HLHS like is now increasing. We present our results of an early single stage procedure for newborns affected by HLHS.

Methods. From October 2011 to April 2013 at CCPM, 22 consecutive patients (pt) underwent hybrid approach procedure. After median sternotomy, the left and right pulmonary arteries were banded by goretex (W.L. Gore & Associates, Inc A), then stent (Genesis-Cordis, USA) was delivered in the arterial duct via a catheter positioned in the main pulmonary artery. A routine catheterization was planned at three month of life.

Results. All patients (median weight 3.04 Kg-range 2.2-4.2) received pre-operative continuous infusion of PGE2 and underwent procedure during the first 72 hours after birth. For arterial ductus stenting pre-mounted stents of diameter from 7 to 10 and lenght from 12 to 19 mm were used. Pulmonary arteries banding was performed by 3 mm custom goretex tube in 10 cases, and a 3.5 mm in the remaining cases. No patients required delayed sternal closure or ECMO. Post operative ICU management was characterized by continuous infusion of systemic vaso-dilatators (fenoldopam), switched to oral therapy in all the cases (Captopril, 1 mg/Kg/die). Enteral feeding was started in the first 48 hours; no cases of Necrotizing Enterocolitis (NEC) was reported. No major cerebrovascular adverse events occurred during hospital stay. Mean hospital stay was 20 days (range 6 to 70 days), mean ICU stay was 11.8 days (range 3 to 70 days). Only 1 patient died 5 days after the procedure; all the other patients survived to the procedure and were discharged successfully from the hospital. At the median follow up of 215 days the mortality was of 9 % (2 of 22 pts). At a median age of 6.8 month 13 patients underwent OMNIA procedure; two patients are now listed for elective surgery; 1 patient underwent bi-ventricular repair; 5 patients are still on follow up after Hybrid procedure. 3 patient died after OMNIA procedure due to myocardial dysfunction and sepsis; while an other patient died after bi-ventricular repair performed in a different cardiac centre.

Interstage period was characterized by surgical atrial septal defect enlargement (2 pts), percutaneous atrial septal stent (5 pts). Recurrent systemic obstruction occurred in five patients: one treated by anterograde restenting; 4 pts treated by percutaneous dilatation of the stent. Three patient required remodulation of the banding. Interstage follow up was conducted by twice visits per month in a dedicated Hybrid Clinic focused on medical therapy, echocardiography evaluation and growth pattern.

Conclusion. In our experience “Early” single stage hybrid approach for HLHS or complex, demonstrated to be safe, efficacy and free from major in-hospital or mid-term adverse events. According to available literature freedom from peri-operative mortality, NEC, delayed sternal closure and high dose inotropic support make it a valid or superior approach when compared with Norwood Stage I. Major concerns remains interstage rate of interventional procedure that can be prevented with an experienced learning curve approach and a rigorous interstage follow up that is mandatory both for anatomic issues and growth pattern.