

“Hybrid” palliation of Interrupted Aortic Arch as initial treatment modality.

Chan K.-C., Perryman R., Valdes-Cruz L., Scholl F.
 Joe DiMaggio Children’s Hospital, Hollywood, Florida, USA

Introduction: Complex interrupted aortic arch (IAA) requiring early surgical treatment can be challenging. We report our experience with the “hybrid” approach for palliation of these infants prior to elective definitive surgery to facilitate concomitant treatment of the associated lesions and to decrease complications.

Methods: Retrospective review of all consecutive patients with IAA that were treated by the “hybrid” approach at a single institution. Complex IAA defined as, weight of less than 2.5kg, multiple VSD, multi-organ system failure and narrow left ventricular outflow tract. All patients were palliated in the “hybrid” catheterization laboratory by a median sternotomy, bilateral branch pulmonary arterial band to 3.0 to 3.5 mm and ductal stenting with nitinol self-expanding stent through a sheath placed directly into the main pulmonary artery. Definitive surgical repair was performed at a mean of 4.4 months. Left heart structural dimensions were measured pre-palliation and prior to surgical repair and are reported.

Results: Seven patients were treated from July 2007 till December 2010. Weight range 2.0 to 3.4 (mean of 2.6) kg. Associated complexity; weight less than 2.5 kg (n=2), multiple VSD (n=2), shock with multi-organ failure (n=1). All “hybrid” palliations were successfully performed with no mortality. All patients were discharged home. One patient died 2 weeks post palliation from necrotizing enterocolitis. All other patients underwent successful biventricular surgical repair. One patient underwent trans-catheter device closure of a muscular VSD and another per-ventricular device closure at the time of surgical repair. Somatic growth and growth of the left heart structures are shown in Table 1.

Conclusions: “Hybrid” palliation of IAA by bilateral branch PA banding and ductal stenting is feasible and provides adequate palliation with excellent somatic growth even in those patients with additional complexities. Although LV structures did not “grow” relative to somatic growth, final repair is facilitated especially in the presence of additional VSDs. This approach provides a safe alternative strategy in complex patients with IAA.

	Mean Pre-hybrid	Mean Pre-Definitive repair	p Value
Weight (Kg)	2.6	4.7	p = 0.0007
BSA (m ²)	0.17	0.26	p = 0.0006
LV Volume (ml)	2.9	4.5	p = 0.002
LV Volume z-score	-2.54	-2.84	p = 0.006
Aortic Valve Annulus (mm)	4.63	5.92	p = 0.005
Aortic Valve Annulus z-score	-2.64	-2.75	p = 0.5
Mitral Valve Annulus (mm)	9.53	11.40	p = 0.025
Mitral Valve Annulus z-score	-0.14	-0.39	p = 0.35