Outcomes in Fontan surgery: the left ventricular hypoplasia as an independent risk factor

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Objective: The group of patients with hypoplastic left heart syndrome (HLHS) palliated with Fontan surgery now comprise a larger proportion thanks to the improvement in survival. The aim of the study is to identify the impact of HLHS in postoperative Fontan results and analyze risk factors for morbidity and mortality.

Methods: Retrospective study of patients palliated with Fontan between 2003-2013 at a single center. Preoperative variables, surgical variables and postoperative complications were collected. Risk factors for acute failure, chronic failure and complications during follow-up were analyzed. HLHS results were compared with those obtained from all patients with Fontan.

Results: 137 patients were recruited. Of these, 41 patients with HLHS (41/137 30%) were identified. The survival was 87.8% (36/41). Mean follow-up: 5 years (1.9 to 11.6). Type of surgery: Fontan in two stages, extracardiac conduit 88% (37/41), lateral tunnel 12% (5/41), fenestrated 90% (37/41), Norwood Sano 73% (30/41). We compared the results with other congenital heart defects: mortality of 12.2% (5/41) vs 4.1% (4/96), acute failure 14.6% (6/41) vs 4.1% (4/96) and chronic failure 12.1% (5/41) vs 2% (2/96). Patients with HLHS were younger before surgery (5.8 ± 1.5 vs 7 ± 3), they had worse ventricular function (10.5% vs 1%) and greater distortion of the pulmonary branches (28.6% vs 4.7%). After surgery HLHS patients presented: longer stay in PICU (15.5 vs 6 days), greater need for early reoperation (33.3% vs 15.2%), higher rate of intervention (40% vs 12.8%), longer pleural effusion (12 vs 9 days), higher incidence of chylothorax (31.6% vs 11.5%), thrombus (20.5% vs 8.8%) and prolonged antiarrhythmic treatment (22.5% vs 11.2%).

Conclusions: Patients with HLHS have a significant impact on morbidity and mortality. This is the Spain’s longest series. In this series HLHS have three times more mortality and acute failure and five times higher incidence of chronic failure. The study of risk factors may be useful to optimize treatment and improve postoperative outcomes.