

YIA-3

Is it true that the one and a half ventricle repair strategy has poor prognosis? - postoperative hemodynamic assessment compared with the Fontan procedure

*Iwasaki H. (1), Ishikawa Y. (1), Kuraoka A. (1), Kodama Y. (1), Nakamura M. (1), Sagawa K. (1), Ishikawa S.(1), Nakano T. (2), Kado H. (2)
Cardiology, Fukuoka Children's Hospital with Fukuoka, Japan (1); Cardiovascular Surgery, Fukuoka Children's Hospital with Fukuoka, Japan (2)*

Introduction: The one and a half ventricle repair (1.5 VR) strategy has been used for patients with a hypoplastic or dysfunctional right ventricle. To date, the 1.5 VR strategy is considered inferior to the Fontan procedure. Most studies assessed heterogeneous populations, and hemodynamic advantages and disadvantages of these strategies remain unclear. We aimed to clarify hemodynamic characteristics of 1.5 VR strategy using one-to-one pair matching of patients who underwent either procedure.

Methods: We retrospectively reviewed patients who underwent 1.5 VR with simultaneous catheterization and magnetic resonance imaging (MRI) between July 2009 and August 2018. Anatomical diagnosis-, age-, and sex-matched patients who underwent Fontan procedure were analyzed via pair matching. Post-operative hemodynamics and flow analysis parameters were examined on phase-contrast MRI.

Results: Overall, 15 patients (7 with corrected transposition of the great arteries and 4 who displayed pulmonary atresia with intact ventricular septum) were evaluated in each group. Median follow-up after either procedure was 9.0 years. The inferior vena cava (IVC) pressures were lower (median, 6.0 vs. 10.0 mmHg; $p = 0.01$), superior vena cava (SVC) pressures were higher (median, 11.0 vs. 9.0 mmHg; $p = 0.09$), respectively, in the post-1.5 VR group than in the post-Fontan group. The IVC and SVC blood flows were lower in the post-1.5 VR group than in post-Fontan group (median, 1.5 vs. 1.8 L/min/m²; $p = 0.01$; median, 0.9 vs. 1.1 L/min/m²; $p = 0.003$, respectively). Systemic and pulmonary blood flows in the post-1.5 VR group were lower than in post-Fontan group (median, 2.4 vs. 2.8 L/min/m²; $p = 0.01$; median, 2.7 vs 3.0 L/min/m²; $p = 0.04$, respectively). The IVC pressure in the post-1.5 VR group gradually increased over time, but remained high from the early postoperative year in the post-Fontan group. Of 7 patients who underwent ultrasonography, no post-1.5 VR patient had finding of hepatic congestion, whereas 3 post-Fontan patients had congestion.

Conclusions: Lower IVC pressures observed in the post-1.5 VR group could be associated with abdominal organ disorder alleviation. All blood flow parameters were lower in the post-1.5 VR group than in post-Fontan group; however, whether this is an advantage remains uncertain.