

Invited Lecture

Invited Lecture08 Sponsored (II-IL08)

Chair: Hajime Ichikawa (National Cerebral and Cardiovascular Center, Japan)

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Sat. Jul 10, 2021 9:55 AM - 10:45 AM Track1 (現地会場)

[II-IL08]The “ Super-Glenn” : towards a Fontan or bi-ventricular circulation

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The superior vena cava to right pulmonary artery shunt was first described by William Glenn as a more stable source of pulmonary blood flow in patients with cyanotic heart disease compared to a Blalock shunt. At present, the Glenn shunt is the most commonly used inter-stage procedure for single ventricle physiology. However, the Glenn shunt provides only a limited amount of pulmonary blood flow, which decreases with age. Flow distribution in the pulmonary arteries has been shown to favor the side of the Glenn connection, and contra-lateral pulmonary artery flow is usually less than 30% of total lung flow when pulmonary resistance in each lung is similar.

The concept of augmenting pulmonary blood flow to a Glenn shunt has been considered for over two decades. However, in most cases this was done by leaving antegrade flow at the time of Glenn creation, usually in young infants with still elevated pulmonary resistance.

Our center has explored the use of supplementary blood flow to the Glenn for the purpose of either increasing flow to the contralateral pulmonary artery and improve systemic oxygenation, or as a way to increase total pulmonary flow and blood return to the left heart to induce left ventricular growth with a plan to achieve a bi-ventricular circulation (BiV). We have termed this approach the “ super Glenn”. We have found that in both instances the additional pulmonary flow, usually with a Blalock shunt, is well tolerated and can result in improved systemic oxygenation and total pulmonary blood flow without significant rise in Glenn pressure. The addition of a restriction between the Glenn connection and the shunt insertion to the contralateral pulmonary artery is often needed to ensure that most of the additional pulmonary flow from the shunt does not compete with Glenn flow.

In a recent report we described our results with 37 patients where a Super Glenn was used as part of a BiV staging procedure. Most children had hypoplastic left heart syndrome as the primary diagnosis. There were no early or hospital deaths and 62% achieved a BiV circulation at a median of 11.3 months after Super Glenn. We conclude that for the Super Glenn that is done for left ventricular recruitment, this procedure achieves consistent growth of the left ventricle. This may be a useful strategy to help achieve a successful BiV circulation in patients with borderline left ventricle. Optimization of pulmonary blood flow is critical and pulmonary over circulation should be avoided. More studies are needed to evaluate the utility of this technique and to further define adequacy and definitions of LV growth as a means to achieving BiV circulation.