Management of Systemic Atrioventricular Valve Regurgitation in Single Ventricle

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Atrioventricular valve regurgitation (AVVR) is associated with increased risk of Fontan circulation failure, morbidity, and premature mortality. A recent publication from the Australia and New Zealand Fontan Registry has shown that the functional (competent) valve is a key component to a successful fontan circulation. Furthermore, the Atrioventricular valve (AV) failure more than doubled the rate of Fontan failure with two-thirds of patients with a common atrioventricular valve and one half with a single tricuspid valve experiencing valve failure by 30 years of age. AVVR can be caused by many distinct structural valvar abnormalities and functional ventricular etiologies.

Due to the limitations and constraints of each available imaging modality, multimodality imaging is often useful to inform decision making. A transesophageal echocardiography is recommended to be used in the peri-operative period to guide surgical repair.

The most common surgical techniques perform for repair of the AV are partial annuloplasty and commissuroplasty. Edge to edge repair had been successful in both tricuspid valve and common AV valve. In common AV valve, another repair strategy involves approximation of the leaflets with a PTFE bridge. Ring annuloplasty can be safely performed in older patients. On annuloplasty the accepted opening orifice to be achieved would be 100% of normal tricuspid valve (TV) at the palliative stage, 80% of the normal TV valve annular diameter at Cavopulmonary shunt (BCPS)and 80% of the normal mitral valve diameter at the Fontan operation.

In general, the Fontan completion should consist of just that, “Fontan completion”. When other significant abnormalities are present, strong consideration should be given to staging to Fontan and correcting the AVVR Prior to Fontan. It is recommended to be more proactive and repair a moderate (functional) regurgitation at the time of BCPS. Valuloplasty at the time of Fontan completion can be considered when there is moderate regurgitation with a morphologic left ventricle that is not dilated and has preserved function with a structural abnormality with the mitral valve. Valve replacement should only be considered in older patients and in heterotaxy syndrome.