Surgical Management Following Initial Palliation with Ductal Stent and/or Radiofrequency Pulmonary Valve Perforation / Pulmonary Balloon Valvuloplasty in Patients with Intact Ventricular Septum-Pulmonary Atresia / IVS-Critical Pulmonary Stenosis

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Introduction: Our approach is to stent the patent ductus arteriosus and to perforate or balloon the pulmonary valve in patients with Intact Ventricular Septum (IVS) – Pulmonary Atresia (PA) or IVS – Critical Pulmonary Stenosis (CPS) as an initial palliative procedure. We investigated the surgical strategies as a second procedure following this palliation.

Methods: Medical records were reviewed in patients with IVS-PA or IVS-CPS who had undergone surgery as a second procedure at our institution between 2010 and 2014. All patients had mono or bipartite right ventricles and ductus dependent pulmonary circulations. The influence of ductal stenting, RF perforation or BD of pulmonary valve and balloon atrial septostomy (BAS) on the second stage surgical management and mortality was examined.

Results: Of 35 patients, 28 (80%) had IVS-PA and, 7 (20%) had IVS-CPS. Twenty-four (69%) patients had bipartite and 11 (31%) patients had monopartite right ventricles. All patients had ductal stent but one. RF perforation and BD were performed in 17 and 4 patients, respectively. BAS was done in 11 (31%) patients. Twenty-six (74%) patients survived following the initial palliation. Seven patients (27%) have been followed up without surgery. Two patients lost to follow-up and 17 (65%) patients (48% of all patients) underwent second stage surgical procedures. Single, one-and-a-half and 2 ventricle repairs have been performed in 7, 6 and 4 patients, respectively. Patients who had undergone one-and-a-half ventricle repair had 2 right ventricle outflow tract (RVOT) reconstructions and 2 pulmonary valvulotomies, Two-ventricle repair patients had 3 RVOT reconstructions and 1 pulmonary valvuloplasty. There was 1 early and 1 late death because of cardiac and non-cardiac reasons, respectively. All the patients with monopartite ventricles who had not undergone BAS at the initial procedure died.

Conclusions: Ductal stenting is effective for pulmonary artery development in patients with IVS-PA or IVS-CPS and provides a straightforward surgery without dealing with pericardial adhesions at the second stage. A sufficient RF perforation or BD of pulmonary valve is necessary for the future one-and-a-half or 2 ventricle repairs. It is important to perform BAS as a part of the initial procedure if the right ventricle is monopartite.