

**Impaired biventricular filling and response to percutaneous pulmonary valve implantation in patients with RVOT dysfunction**

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**Objectives:** Atrial dysfunction and impaired ventricular filling have been described in patients with right ventricular outflow tract (RVOT) dysfunction. While the effect of percutaneous pulmonary valve implantation (PPVI) on ventricular properties has been described, its effect on atrial dimensions and function is less well characterized. We thought to assess left and right atrial volume and function in patients with RVOT dysfunction and to study the impact of PPVI on atrial remodelling.

**Methods:** Patients with RVOT conduit dysfunction who underwent CMR before and after PPVI as part of their routine clinical assessment were included. Right (RA) and left atrial (LA) end-diastolic (EDV) and end-systolic (ESV) volumes as well as atrial passive and active emptying function were assessed using standard axial cine slices.

**Results:** One-hundred and eleven patients were included (median age at PPVI 18.6; 6.2 - 53.2 years, 41 females (36.9%), CMR 6.2±2.1 months post PPVI). Baseline RA passive emptying function as a correlate for early diastolic ventricular filling showed a significant relationship with invasive RV end-diastolic pressures ( $r=0.27$ ,  $p=0.01$ ). Both RA passive emptying function ( $r=0.23$ ,  $p=0.04$ ) and LA passive emptying function ( $r=0.26$ ,  $p=0.02$ ) were significantly related to peak VO<sub>2</sub>. After PPVI there was a significant decrease in RAEDV (38±17 to 33±15 ml/m<sup>2</sup>;  $p< 0.0001$ ) and RAESV (58±21 to 52±20 ml/m<sup>2</sup>;  $p< 0.0001$ ). RA passive emptying function improved significantly (19±6 to 22±6%;  $p< 0.0001$ ) whereas RA active emptying function decreased significantly (33±14 to 32±10%;  $p=0.005$ ). LAESV (36±10 to 38±10 ml/m<sup>2</sup>;  $p=0.001$ ) but not LAEDV (19±7 to 19±6 ml/m<sup>2</sup>;  $p=0.09$ ) increased while LA passive emptying function improved (31±7 to 33±8%;  $p< 0.001$ ) significantly and LA active emptying function (43±13 to 42±11%;  $p=0.79$ ) remained unchanged.

**Conclusions:** RA and LA passive emptying function as a correlate of ventricular diastolic function were significantly related to exercise capacity in patients with RVOT dysfunction. Both improved after PPVI suggesting a positive impact of the percutaneous intervention on diastolic dysfunction in these patients.