

## YIA-1

### 3D volume analysis by transesophageal echocardiography of right and left ventricle just after transcatheter device closure of atrial septal defect

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**Introduction:** Little is known about quantitative change of ventricles just after transcatheter device closure of ASD. The objective of this study was to clarify the effects of ASD closure on ventricular functions and volume by three-dimensional transesophageal echocardiography(3DTEE).

**Methods:** We investigated consecutive 29 patients who underwent ASD device closure in our institute guided by TEE from January to October 2016. Eight patients were excluded due to their moderate and severe tricuspid valve regurgitation or their poor image quality. Of the total, 18 patients (ranged 6 to 71, median 27 year-old) were enrolled in this study. 3D ventricular volume data were derived before and after closure during operation to assess right ventricular end-diastolic volume (RVEDV), right ventricular end-systolic volume (RVESV), left ventricular end-diastolic volume (LVEDV) and left ventricular end-systolic volume (LVESV). The pulmonary to systemic flow ratio (Qp/Qs) was calculated by using estimated systolic volume from the difference between EDV and ESV by 3D TEE:  $(RVEDV - RVESV) / (LVEDV - LVESV)$ , comparing with Qp/Qs calculated by catheter. **Results:** The Bland-Altman plots revealed Qp/Qs derived from 3D volume data (mean $\pm$ SD: 1.72 $\pm$ 0.41) showed good agreement with that from catheter (mean $\pm$ SD: 1.87 $\pm$ 0.43) (mean difference $\pm$ SD: -0.16 $\pm$ 0.15). While the mean EDV was changed dynamically from 110.6 to 98.6ml (RV), 60.2 to 70.2ml (LV), the mean ESV showed only slight changes: 57.7 to 57.0ml (RV), 29.4ml to 29.3ml (LV), respectively. Thus, the changes of EDV were likely to correlate with the decrease of Qp/Qs. All of the Qp/Qs derived from 3D TEE after ASD closure showed around 1.0 (mean $\pm$ SD: 1.04 $\pm$ 0.07), which reflected the ventricle-adjusts after shunt closure. **Conclusions:** Volume data by 3D TEE can assess the effects of preload changes on bilateral ventricles correctly.