

Right Atrial and Ventricular Function After Surgical and Percutaneous Closure of Atrial Septal Defect: A Strain Rate Imaging Study

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Basics: Two-dimensional (2D) strain analysis is a new tool to assess myocardial function. Strain and strain rate (SR) can quantify local myocardial function independent of the heart motion. The aim of this study was to compare the effects of surgical and device closure of atrial septal defects (ASD) on atrial and ventricular performance assessed by using strain and SR imaging.

Methods: In all, our study consisted of 45 patients : 15 patients after successful ASD device closure (ASD-D, atrial septal defect device closure group) aged 7.8 ±4.3 years ; 15 patients after successful ASD surgical closure (ASD-S, atrial septal defect surgical closure group) aged 7.5 ±4.6 years and 15 healthy subjects of similar age distribution and characteristics as control group. All patients underwent ASD correction at least 6 months before the study. Peak right ventricular (RV) longitudinal strain, RV lateral and septal strain, peak atrial longitudinal strain (es) and SR during systole (SRs), SR during early RV filling (SRe) and late RV filling (SRa) were measured.

Results: In the ASD-D group there was no significant difference in both RA and RV deformation properties when compared with control subjects. In the ASD-S group the peak systolic strain and SR values were significantly reduced in RA and RV when compared with control and ASD-D groups.

Conclusion : Strain and SR imaging provide clinically acceptable a deep inspection on regional changes in atrial and ventricular function for patients with ASD. Our results showed that right atrial and ventricular regional performance assessed by 2D strain analysis is reduced after surgical closure, but not after transcatheter atrial septal defect closure. In contrast to surgery, transcatheter closure of atrial septal defect preserves atrial and right ventricular function.