

# ASSESSMENT OF VENTRICULAR FUNCTION IN PATIENTS OF ATRIAL SEPTAL DEFECT BY STRAIN IMAGING BEFORE AND AFTER CORRECTION

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## BACKGROUND

Atrial septal defect is a common congenital heart defect associated with volume overload of the right ventricle (RV) and variable effect on the left ventricle (LV).

Two-dimensional (2D) Strain analysis is a new tool for objective analysis of myocardial function.

## OBJECTIVE

This study evaluates systolic function of both, the right and left ventricle, by conventional 2D echo and by strain echo and measures changes in cardiac hemodynamics that occurs in patients with atrial septal defects (ASDs) before and after correction.

## MATERIALS AND METHODS

This is an observational study in which we analyzed 32 patients who underwent ASD correction either by transcatheter or surgical route between Mar 2015 and Sept 2016.

We performed 2D echo and strain analysis of each patient before correction and at 48 hrs, 3 months and 6 months after correction.

We measured volume of both atria indexed to body surface area (BSA), dimensions of both ventricles and systolic function of both ventricles by right ventricular myocardial performance index (RVMPI), left ventricular myocardial performance index (LVMPI) and ejection fraction (EF) as well as global longitudinal strain of both ventricles.

## RESULTS

Left atrial (LA) volume decreased significantly from baseline to 1<sup>st</sup> follow up at 48 hours ( $26.2 \pm 2.2$  to  $24.8 \pm 2.1$ ,  $p < 0.05$ ) in the transcatheter group while there was non-significant increase in LA volume ( $21.1$  to  $23.3$ ,  $p = 0.16$ ) in surgical group. RA volume decreased significantly in both groups.

There was a reduction in RV dimensions at 48 hrs ( $36.2 \pm 3$  to  $33.5 \pm 3.6$ ,  $p = 0.02$ ) in the transcatheter group while a significant reduction in the surgical group occurred at 3 months; similarly, there was increase in LV dimensions at 3 months in both the groups.

Improvement in right ventricular global longitudinal strain (RVGLS) occurred in 48 hrs post-op in the transcatheter group ( $-24.5 \pm 3.2$  to  $-21.2 \pm 1.7$ ,  $p < 0.05$ ) while it took 3 months to improve in surgical group.

There was a significant improvement in left ventricular global longitudinal strain (LVGLS) after 6 months of correction in transcatheter group while this change was not significant in surgically treated patients.

## CONCLUSIONS

There is decrease in the LA volume after transcatheter closure of ASD whereas LA volume increased in the surgical group.

Closure of ASD improves RV function (within 48 hrs in transcatheter group and within 3 months in surgical group) with variable effect on LV function.

There is improvement in RV function with subtle change in LV function by strain imaging and these changes nearly correlate with conventional 2D Echo