

# Impact of Transcatheter Closure of Atrial Septal Defect on Right Ventricular Size and Function by Echocardiography

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## Abstract

**Background:** Percutaneous atrial septal defect (ASD) device closure is a safe and effective means of reducing or eliminating interatrial shunting. The response of the right heart to device closure is incompletely understood.

**Objective:** To evaluate the effects of transcatheter closure of secundum ASD on right ventricle size and function, that is, both systolic and diastolic by transthoracic echocardiography (TTE) over a 6 month period.

**Patients and Methods:** One hundred patients had 100 device implantations. The patients were assessed with echocardiography before, at 1 and 6 months after procedure, at Bab Al-Shaareya Hospital of Al-Azhar University, and National Heart Institute, Egypt during the period from April 2017 to October 2019.

**Results:** Mean age was (12.62±11.39 years). Maximum ASD size indexed to body surface area (BSA) was (Mean±SD=17.88±5.08 mm/m<sup>2</sup>). The device size ranged from 11 mm to 31 mm. There was significant decrease from baseline to 1 month and baseline to 6 months after closure In the following indexed parameters: RV basal, mid, longitudinal diameters I, RV end diastolic area I, RV/LV end diastolic dimension ratio, RA end systolic area I and Estimated systolic pulmonary artery pressure (ESPAP), Also parameters of RV systolic functions such as; tricuspid annular plane systolic excursion (TAPSE), tricuspid annular systolic velocity (TASV or S<sup>∧</sup>) and fractional area change (FAC%), and diastolic dysfunction parameters; E/A and E/e<sup>∧</sup>, (p=0.001). while RV index of myocardial performance (RIMP) showed significant reduction at one month (0.39±0.03 vs. 0.35±0.02; p=0.001) and non-significant change at six months in comparison to baseline (p=0.083).

**Conclusion:** RV volumes decreased significantly in the first month after ASD device closure and continued up to 6 months. There was no change in global right ventricular systolic function but a high basal RV systolic function decreased after closure. Some patients had impaired diastolic function before closure of defect, which reversed to normal within 6 months after closure.

**Keywords:** Atrial septal defect, Right atrium, Right ventricle .