

Transcatheter Closure of Atrial Septal Defects Improves Right Ventricular Function

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Introduction: Atrial septal defect (ASD) is one of the most frequently encountered congenital heart conditions. Ostium secundum ASD is the most common type, accounting for 50-70% of all cases. Transcatheter closure of ASD, has been introduced into practice 30 years ago and because of new developed devices it gained speed in the last ten years.

Right ventricular volume overload is a well-known cardiac consequence of ASD shunt. Thus cardiac volumetric unloading is a major aim of transcatheter ASD closure. Echocardiographic measurement of right ventricular function is challenging due to its complex geometrical shape. The tissue Doppler myocardial performance index (MPI) and tricuspid valve annular plane systolic excursion (TAPSE) allow assessment of right ventricular function in children.

Aim of our study is to determine the effects of atrial septal defects and their closure on systolic and diastolic right ventricular functions.

Material and Methods: We enrolled 25 patients with secundum ASD that was suitable for transcatheter closure and underwent successful transcatheter closure. 20 healthy, age and body mass index matched children were enrolled too. Echocardiography was performed before, 24 hours and 1 month after transcatheter closure and compared with control group.

Results: For study group mean age was $98,92 \pm 41,06$ months, mean BMI was $17,2 \pm 4,05$ kg/m², 56% male, 44% female mean ASD diameter was $14,56 \pm 1,84$ mm. For control group mean age was $101,2 \pm 31,92$ months, mean BMI was $16,58 \pm 2,74$ kg/m², 50% male, 50% female. Compared with control group TAPSE measurements were statistically significantly low in study group before closure ($17,42 \pm 2,88$ mm, $p=0,001$), there were statistically significant increase after the first day and first month of closure ($19,27 \pm 2,9$, $19,59 \pm 2,35$, $p=0,008$, $p=0,015$, respectively). Compared with control group MPI measurements were statistically high in study group before closure ($19,59 \pm 2,35$, $p=0,0001$). There were a statistically decrease after the first day and first month of closure ($0,48 \pm 0,09$, $0,33 \pm 0,05$, $p=0,0001$, $p=0,0001$ respectively).

Conclusions: Transcatheter ASD closure led to increase in TAPSE and decrease in right ventricular MPI in early period. When compared with control group; high MPI and low TAPSE measurements before closure suggests decreased right ventricular function. After transcatheter closure markedly decreased MPI and increased TAPSE show that right ventricular function improve after transcatheter ASD closure in early period.