

NT-proBNP correlated with strain and strain rate imaging of the right ventricle before and after transcatheter closure of atrial septal defects

Elsheikh Raghda G.(1), Hegab M.S.(2), Zatmari A. (3)

Tanta University Hospital, Tanta Egypt (1); Mahalla Cardiac Center, El Mmahalla El Kobra Egypt (2); Hungarian Institute of cardiology, Budapest Hungary (3).

Background: Atrial septal defect (ASD) accounts for 10% of all congenital heart lesions.

Our objectives were: Using strain and strain rate imaging to assess right ventricular (RV) function in patients with RV volume overload due to ASD and correlate the results with the level of N-terminal pro-brain natriuretic peptide (NT-proBNP) before and after device closure.

Subjects & Methods: 45 patients (27 females and 18 males) mean age 21.53 years were diagnosed with ASD and admitted for percutaneous closure. For assessment of systolic RV function by echocardiography, we measured tricuspid annular plane systolic excursion (TAPSE), strain, and strain rate Imaging (SRI). Amplatzer ASD Occluder used under general anesthesia. Plasma levels of NT-proBNP concentrations were measured before and three months after closure.

Results: Amplatzer ASD closure was achieved in all patients with no complications. The mean ASD diameter was 15.15 mm and the stretched diameter was 18.72 mm. Our study group had average or mild increased pulmonary artery pressure and mean shunt volume was 2.3. The mean left atrial diameter in pre ASD closure group was significantly higher than the control, with non significant difference after closure; mean left ventricular end diastolic dimension showed non significant difference from either control group or post ASD closure group. While mean right ventricular end diastolic dimension showed markedly reduction post ASD closure, and it was significantly higher than control group. Global RV strain and peak systolic strain rate (PSSR) were significantly higher in ASD group than control group. Three months after device closure, there was significant reduction of the global RV strain, PSSR, TAPSE and mean NT-proBNP levels. The NT-proBNP levels found to be correlated with pulmonary artery pressure, TAPSE, as well as the global RV strain and PSSR.

Conclusion: Amplatzer ASD occluder is simple in construction, easy to deploy, and can be withdrawn and repositioned many times. Volume overload induced by ASD is associated with increased RV strain values, which return to normal after closure. NT-proBNP is a parameter which correlates to RV function, pulmonary artery pressure and the amount of interatrial shunt volume caused by the underlying ASD.