

The Three-dimensional Morphometric Change Of Atrial Septum After The Device Closure Of Atrial Septal Defect Along The Growth

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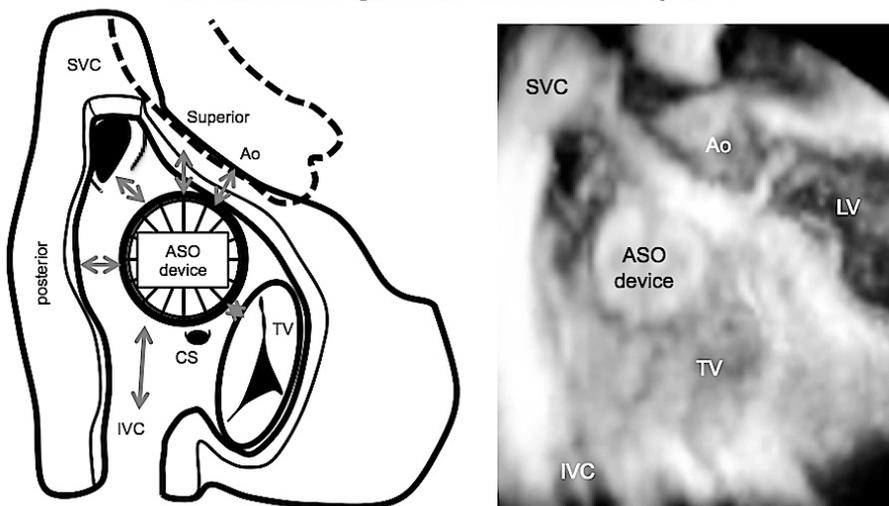
Introduction: Major risk factor for cardiac erosion after percutaneous device closure of secondary atrial septal defect (ASDII) by Amplatzer Septal Occluder (ASO) is a bald or remnant of aortic rim which was not uncommon in pediatric patients. The study aimed to clarify how each rim of ASDII develops along the sequential growth after implantation of device, using three-dimensional echocardiography (3DE).

Methods: Sixty children with ASDII (age: 3-13 years), who underwent device closure by ASO from in January 2007 to December 2013, were enrolled to this study. The device size ranged 9-24mm in diameter and 14mm as a median) was used for ASO. The three-dimensional distance of each rim was analyzed and measured by off-line software of QLAB from full acquisition of 3DE data set of apical four-chamber view and its reconstructed data, obtained by iE33 with X7-2 and X5-1 probe (Philips MS). The distance between the edge of device and each rim was compared sequentially at P1 (1-3 days), at P2 (3-11 months), at P3 (1-4 years), and at P4 (>5 years).

Results: All distance between each rim and the edge of device were significantly increased along the time interval (P1 to P4) and the patient's growth; (1) tricuspid valve : 10.3 at P1 to 13.4 mm at P4 , (2) mitral valve: 6.9 to 9.0 mm,(3) posterior rim: 5.3 to 7.6 mm, (4) superior vena cava: 14.2 to 17.0 mm, (5) inferior vena cava: 14.8 to 18.0 mm, (6) superior rim (to LA ceiling wall): 7.9 to 11.2 mm, (7) coronary sinus : 4.1 to 5.7 mm, (7) aortic rim: 1.1 to 1.8 mm. However, cases with absent or bald aortic rim demonstrated no growth of the distance to the edge of devices (0 to 0.3mm), regardless how the device edge contact to adjacent rim.

Conclusions: The atrial septal rim can grow along patients' growth in all cases but those with absent or bald aortic rim who had a direct contact to device edge. This suggests a potential risk of erosion doesn't reduce along a time in this category of the patients.

The anatomical right atrium view after ASO by 3DE



Ao:aorta, IVC:inferior vena cava, LV:left ventricle, SVC:superior vena cava, TV:tricuspid valve