Editorial

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Transcatheter Closure of Secundum Atrial Septal Defect in Patients Over 60 Years Old

Jae Young Choi, MD

Division of Pediatric Cardiology, Severance Cardiovascular Hospital, Yonsei University Health System, Yonsei University College of Medicine, Seoul, Korea

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Atrial septal defect (ASD) is the most frequently diagnosed congenital heart disease in adulthood. Along with the recent evolvement of therapeutic catheterization, transcatheter closure has become the treatment of choice in most secundum type ASDs in children and adults. However, clinical decision and technical details may be influenced by special circumstances including complex morphology of the defect, co-morbid disease, significant arrhythmia, pulmonary arterial hypertension (PAH), tricuspid or mitral insufficiency, ventricular dysfunction, and age of the patient, especially in very young or elderly patients. Pathophysiology in elderly patients with hemodynamically significant ASD shows the nature of the problems to be very complex; such problems are frequently combined and usually interacted negatively. Nevertheless, transcatheter ASD closure may be potentially subtracted from the treatment option because the risk-benefit relationship of the procedure has been less-clearly defined in this age group.[1)]

In this issue, the article by Woo et al.[2)] reported the safety and efficacy of the transcatheter closure of ASD in elderly patients. In spite of the small cohort of patients, this study also demonstrated the substantial risk and complications frequently encountered in elderly patients with ASD. All of their patients who successfully underwent device closure except for 1 fatal case, showed improvement of functional status or were in New York Heart Association functional class I, along with the favorable geometric reverse remodeling of the heart on the follow-up evaluation. PAH was detected in 65.2% of their cohort including 3 patients with mean pulmonary arterial pressure exceeding 40 mm Hg (peak systolic pressures were not described), while fenestration of the device was not performed in any of the patients. The use of a self-fabricated fenestrated device has been reported to reduce post-procedural risk either in patients with severe PAH or in elderly patients at the risk of masked left ventricular (LV) restriction.[1)3)4)] The indications for implanting a fenestrated device in patients with PAH are not yet clearly defined, whereas many interventionists consider using a fenestrated device in patients with severe PAH (usually defined as peak systolic pulmonary arterial pressure ≥60 mm Hg). A "masked LV restriction" is suspected when serious pulmonary edema secondary to LV dysfunction and increase in left atrium (LA) pressure develop after ASD closure,[5)] and may appear in 2% to 3.6% of elderly patients.[6-8)] The pathogenetic mechanism may be explained by chronic compression of LV due to the dilated right ventricle which reduces the LV end-diastolic volume in a chronic setting. The authors postulated that the death of one patient might have been caused by acute LV dysfunction which may correspond to the masked LV restriction. Unfortunately, they failed to screen this patient from current protocols for detection of masked LV restriction. Another possibility is that the patient died due to a cause other than the masked LV restriction. They failed to enroll the patient as a candidate for a balloon occlusion test (BOT), because the patient showed relatively low LA pressure and LV end-diastolic pressure on the baseline hemodynamic study. There are 2 different protocols for detection and management of LV restriction, which have been independently described by 2 separate groups.[5)7-9)] Both protocols include temporary BOT with LA pressure measurement, whereas each protocol has many different criteria to define a significant LV restriction.[1)] Despite their usefulness, these protocols are based on empirical experiences rather than cumulated data which raises the need

Correspondence: Jae Young Choi, MD, Division of Pediatric Cardiology, Severance Cardiovascular Hospital, Yonsei University Health System, Yonsei University College of Medicine, 50 Yonsei-ro, Seodaemun-gu, Seoul 120-752, Korea
Tel: 82-2-2228-8473, Fax: 82-2-312-9538
E-mail: cjy0122@yuhs.ac

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for the development of a new evidence-based guideline from subsequent large population based studies. In addition, BOT should be performed very carefully because several issues may be involved in the technical details of BOT including temporary obliteration of the pressure catheter tip, incomplete occlusion, as well as temporary restriction of the LA volume by a bulky, inflated balloon positioned inside the LA.

Another serious complication in this group of patients is arrhythmia, most frequently atrial fibrillation followed by atrial flutter. There is a lack of data concerning the outcome of transcatheter ASD closure in elderly patients with chronic atrial arrhythmia. However, a study has revealed that transcatheter closure of ASD in elderly patients with permanent atrial fibrillation resulted in an improvement of functional status and reverse remodeling of the heart.[10] A dramatic improvement in functional status in their patients indicates that volume overload is the key issue, rather than the atrial fibrillation, responsible for the poor functional performance in this patient group. Therefore, there has been a consensus that device closure with medical therapy (rate control) may be an attractive therapeutic option in elderly patients with chronic atrial fibrillation, especially in patients associated with high risk for surgery. Catheter ablation of atrial arrhythmia and device closure may also be a good option as the authors treated one of their patients this way.

As the authors demonstrated in their article, it is also very important to detect and manage co-morbid systemic and cardiac diseases in the elderly ASD patient, not only because of the high prevalence of coincidental diseases in this age group, but also because the co-morbid diseases may further complicate the procedure as well as negatively influence the outcome, and most importantly many of these adverse events could be prevented by adequate peri-procedural management.

Therefore, this report of the author's initial experience implies the importance of a thorough and individualized evaluation followed by a meticulous strategic approach for transcatheter ASD closure in elderly patients. Moreover, close follow-up as well as optimal treatment of residual and co-morbid diseases are imperative to ensuring a good outcome after device closure; in addition, the patients should be fully informed about the nature of serious complications such as chronic atrial arrhythmia and PAH, in order to promote compliance with further medical treatment.

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