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Editorial

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The Use of Diuretics on Atrial Septal Defect: To Use or Not to Use

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▸ See the article "Association between the Use of Diuretics and Size Reduction in Pediatric Atrial Septal Defect" in volume 51 on page 1017.

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Atrial septal defect (ASD) is one of the most common congenital heart defects and its incidence is varied by the time period and the target population studied. The chronic left-to-right shunt through the ASD makes right-sided heart volume overload/dilatation, pulmonary overflow/congestion, pulmonary hypertension, atrial arrhythmia, and negative effect on left heart growth. Therefore, transcatheter or surgical closure have to perform at the right time.

Most patients with isolated ASDs are asymptomatic in early childhood and show a high spontaneous closure rate. The spontaneous closure rate of ASD has been reported from 4% to 87% because of the diverse study population including the patients' age.[1-4] The predictor of spontaneous closure and significant growth of ASDs is the initial size of the defect at diagnosis.[2)4)]

And some authors recommend that any defect larger than 8 mm with evidence of a significant left to right shunt should be closed even in very young patients because such a defect will likely never close spontaneously and may even get larger.[5)]

The appropriate timing for closure has been controversial. But most authors recommend closing ASD around 3 to 5 years of age before the patients go to school. However, some patients with chronic lung problem by prematurity, genetic problem or significant co-morbidity including congenital diaphragmatic hernia may present with heart failure in early infant. In these clinically symptomatic children, early closure is recommended to prevent pulmonary overflow and improve the clinical condition by surgical or transcatheter technique.

Recently, technical development made transcatheter closure to become the treatment of choice in most secundum ASD in children and adults. Also, transcatheter closure shows a short length of hospital stay, lower rates of infections and complications. Therefore, transcatheter closure has been considered the standard therapy in eligible children for secundum ASD.

However, transcatheter closure of ASD in the infant or early childhood is not usually recommended because of the relatively high complication rate. The high risk group for periprocedural and late complications is the children whose bodyweight is less than 15 kg.[6)]

Of course, there are recent reports for transcatheter closure of ASD that showed excellent short and long-term results in less than 2 years old and 10 kg patients.[7)8)] That is, meticulous

evaluation of morphology for ASD and its adjacent structure, well-prepared and delicate procedure, and some special techniques as like balloon-assisted or pulmonary vein technique can make the transcatheter closure safe and feasible in early childhood.

For this point, Lee et al.[9] showed the effect of diuretics on large secundum ASD and tried to delay the optimal timing of transcatheter closure. Despite a small cohort of patients, they showed the beneficial effect of diuretics and suggested that diuretics administration may decrease the possibility of surgical closure and is associated with the use of smaller ASD devices through reduction of ASD size. In their cohort, device closure was performed more frequently in the diuretic group than in the non-diuretics group. They showed that the use of diuretics was the significant factor independently associated with ASD diameter decrease. And initial ASD diameter and inferior vena cava (IVC) rim deficiency also showed significance for ASD diameter change.

However, there are the different proportions of rim deficiency in their cohort. As aforementioned, rim deficiency affects the strategy of ASD closure. The patients with posterior rim deficiency were common in both groups, but the patients with IVC rim deficiency were statistically higher in the non-diuretics group. Although there is some concern and natural course for rim deficiency, IVC rim deficiency is contraindicated to transcatheter closure because of the high risk of embolization, and surgical repair is preferred. On the other hand, partial posterior rim deficiency can be overcome by various techniques. Also, it can explain the ASD size change. Unfortunately, they showed the relationship between size change and posterior rim deficiency in only the diuretics group where there were only 3 patients with IVC rim deficiency. On the other hand, 14 of 33 patients (42.4%) were IVC rim deficient in the non-diuretics group. Therefore, the correlation between rim deficiency and diuretics is not clear.

Also, the use of diuretics for asymptomatic patients is controversial. Many clinicians use diuretics for the control of heart failure in symptomatic patients with shunt lesions like ventricular septal defects, patent ductus arteriosus. Diuretics can decrease volume overload and pulmonary congestion, and they can gain time for observing the natural closure of the defects. And, sometimes it can make change the treatment strategy. However, there is no clear evidence for the diuretics usage in asymptomatic ASD patients even with relatively safe low dosage.

However, this report is important in that it showed the possibility of ASD size reduction by the use of diuretics. Moreover, it may change the treatment strategy to transcatheter closure of large ASD in early infants. Therefore, the use of diuretics in children with large secundum ASD is worth considering before a decision of treatment.

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