

Treatment strategy of transcatheter closure in the combination of atrial septal defect and patent ductus arteriosus

Atrial septal defect (ASD) and patent ductus arteriosus (PDA) are common congenital heart diseases, and transcatheter closure of each of the isolated defect is now widely accepted as an alternative to surgical closure. However, the combination of the two defects is considered extremely rare, with a frequency of 0.08–1.2% in patients with congenital heart disease. Although several pediatric cases with both ASD and PDA have been successfully treated by transcatheter closure using an Amplatzer septal occluder (ASO) for ASD and either Gianturco coils or an Amplatzer duct occluder (ADO) for PDA, an adult case with a diagnosis or treatment of both ASD and PDA has not been reported so far.

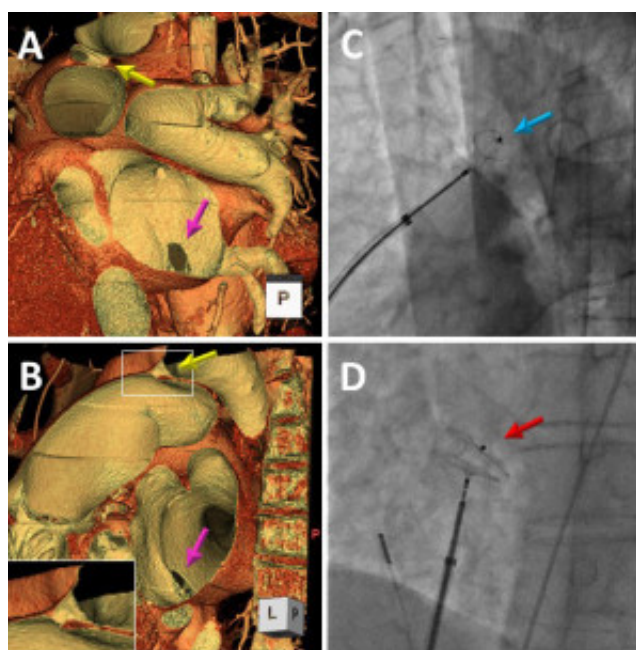


Fig. 1. Evaluation of atrial septal defect (ASD) and patent ductus arteriosus (PDA) in three-dimensional cardiac computed tomography (3D-CT), and fluoroscopic images after transcatheter closure of ASD and PDA. (A and B) Combined ASD (purple arrow) and PDA (yellow arrow) on reconstructed 3D-CT using Ziostation2 (Ziosoft Inc., Tokyo, Japan). (C) Amplatzer duct occluder deployment on fluoroscopic imaging (blue arrow). (D) Amplatzer septal occluder deployment on fluoroscopic imaging (red arrow).

We recently reported an adult case of simultaneous transcatheter closure of an ASD and PDA (Fig. 1A, B). The PDA was initially closed with an ADO (Fig. 1C), but a mild residual shunt, which was

considered tolerable, was observed after the PDA occlusion. Then, the ASD was successfully closed with an ASO (Figure 1D). Although two kinds of antiplatelet are generally added after ASD occlusion to prevent device thrombosis, only 100mg aspirin was added in this case because the patient had been taking warfarin for chronic atrial fibrillation. Then a reduction in circulating platelet count and subclinical hemolysis (mild elevation of total bilirubin and lactate dehydrogenase) were observed on the day following the procedure provably due to the residual shunt through PDA device. (Both thrombocytopenia and hemolysis are reported to be rare complications after PDA closure through the residual shunt.) The thrombocytopenia and subclinical hemolysis ameliorated after discontinuation of aspirin 3 month after the procedure, and it was considered that the antiplatelet therapy for ASO might have exacerbated and prolonged the thrombocytopenia.

From our experience of this simultaneous transcatheter closure of an ASD and PDA in an adult case, followed by thrombocytopenia and subclinical hemolysis, we suggest the treatment strategy in which ASD closure is performed at least several months after PDA closure, when a residual shunt through the ADO has likely disappeared. It is because antiplatelet therapy is required after ASD closure and the risks of thrombocytopenia and hemolysis via a residual shunt in ADO increase. And even in the situation where these two procedures should be performed simultaneously, we suggest closing the PDA prior to the ASD, considering anatomical problem and hemodynamic changes after ASD closure.

Mai Kimura and Hideaki Kanazawa
Department of Cardiology, Keio University School of Medicine
Tokyo, Japan

Publication

[Simultaneous Transcatheter Closure of an Atrial Septal Defect and Patent Ductus Arteriosus in an Adult Case, Followed by Thrombocytopenia and Subclinical Hemolysis.](#)

Kimura M, Kanazawa H, Kawamura A, Yamamoto T, Egashira T, Kohno T, Maekawa Y, Sano M, Fukuda K.

Int J Cardiol. 2016 Mar 15