Perimembranous Ventricular Septal Defect Device Closure: 
Choosing between ADOI and ADOII

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Background: Transcatheter closure of perimembranous ventricular septal defects (pmVSDs) is a well-established procedure. Recently, Amplatzer duct occluders (ADO) I and II have been reported to close large series of pmVSDs successfully (off-label use). ADOs are economical compared with the standard Amplatzer VSD occluders; a major consideration in developing countries with low budget programs.

Aim of the work: We report closure of symptomatic, hemodynamically significant pmVSDs using the ADOI and ADOII devices. Although there are no set criteria for choosing between ADOI and ADOII, the former's price tag includes snare and long sheath. Thus, we aim to predetermine device usage based on transthoracic echocardiography (TTE) findings.

Methods: Between March 2013 and November 2014, 30 patients had transcatheter closure of pmVSDs using the ADO devices. The median age was 4.5 years (range: 1.1-54 yrs) and median weight was 15 kg (range: 6-87 kg). ADOII could not be used in VSDs larger than 6 mm and/or with a large aneurysm. The median VSD size as assessed by echocardiography was 6 mm (range: 3-12 mm), while by angiography it was 5 mm (range: 3-9.5 mm).

Results: The median fluoroscopy time (FT) was 8 minutes (range: 5-38 min). We inserted ADOI in 14 patients and ADOII in 16 patients (no significant difference between median age and weight in each group). VSD size was significantly larger and FT was longer in ADOI patients; the device type matched what was decided from TTE data in 85% of cases. Follow up ranged from 1-21 months (median 8 months). The mean LVEDD z-score of the patients was 1.1 before VSD closure, while it was 0.63, 0.35 and 0.23 at the 1-month, 3-month and last follow up, respectively. Complete closure rates immediately, at 24 hours and at last follow-up were 80%, 90% and 94% respectively. No patient developed heart block or any other complication.

Conclusion: ADOI and ADOII are equally safe and effective in pmVSD closure. ADOII use, although cheaper than ADOI, is limited to smaller VSDs. The choice between ADOI and ADOII can be decided by TTE prior to procedure which is convenient in low economic programs.