Safety of transcatheter closure of atrial septal defect with a fenestrated Amplatzer septal occluder in patients with pulmonary hypertension or heart failure

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Purpose: In patients with atrial septal defect (ASD) complicated with moderate-to-severe pulmonary hypertension or heart failure, complete closure of the defect may carry significant risks. A fenestration was generally created in the occluder for gradual reduction of shunt to close the ASD in those high risk patients.

Methods: During a 10.5-year period, 44 patients (10 males) with ages ranging from 7 to 81 years underwent transcatheter closure of ASD with a fenestrated device. Of them, 39 patients had moderate-to-severe pulmonary hypertension, 4 had heart failure and 1 had pulmonary atresia intact ventricular septum with a right atrial pressure above 15 mm Hg after balloon test occlusion. A fenestration was created about 1/3 to 1/4 of the diameter of the Amplatzer septal occluder. The techniques of device deployment are similar to those reported.

Results: Of the 44 patients, the mean pulmonary artery systolic pressure was 66 ± 18 mmHg & mean Qp/Qs ratio was 2.7 ± 1.4. The mean device diameter used was 30 ± 6 mm. Implantation was initially successful in all 44 patients. Immediately after implantation, shunt flow across the fenestration was observed in all 44 patients. However, 1 developed embolization of the device several hours later. The patient was sent for emergent surgery. After a mean follow-up period of 42 ± 15 months, majorities of patients had improvement in symptoms, regression of right heart dilation & decrease in pulmonary artery pressure. Three patients underwent a second procedure to close the residual defect because of presence of significant shunt 12 months later. Twelve patients received Sildenafil. Six patients had very small residual shunt noted on the most recent echocardiography.

Conclusions: Transcatheter closure of ASD in patients with moderate–to-severe pulmonary hypertension or heart failure using a fenestrated device is safe and effective.