Successful device closure in a congenital Gerbode defect

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Postep Kardiol Inter 2015; 11, 2 (40): 158–159
DOI: 10.5114/pwki.2015.52294

A 22-year-old man was admitted to our department due to mild exertional dyspnea for 2 months. He had no other cardiac symptoms and his medical history was unremarkable. 4/6 systolic murmur was heard at the left sternal border and at the apex. Electrocardiogram revealed sinus rhythm with negative T waves in leads V1 to V4. Two-dimensional transthoracic echocardiography (2D TTE) revealed a clear systolic jet across a defect (7 mm) between the left ventricular outflow tract (LVOT) and right atrium (RA) consistent with a Gerbode type defect located above the tricuspid septal leaflet (Figure 1 A). Qp/Qs ratio, maximal velocity (Vmax) and trans-shunt pressure gradient were 2.1, 5.1 m/s and 103 mm Hg, respectively. Right ventricular systolic pressure (RVSP) was estimated at 51 mm Hg assuming a right atrial pressure of 15 mm Hg. The direction of the Doppler signal confirmed our diagnosis (Figure 1 B). Furthermore, three-dimensional transthoracic echocardiography (3D TTE) also demonstrated a supravalvular connection between these chambers in detail. Due to the proximity of the defect to the septal tricuspid valve leaflet, the Amplatzer duct occluder (AGA Medical Corporation; Golden Valley, USA) provided a reasonable fit because it has no right-sided disk that might interfere with tricuspid valve motion. The defect size and trans-shunt pressure gradient were compatible with echocardiographic evaluation. The patient refused the surgery; therefore we suggested device closure. After the patient's consent, the defect was successfully closed percutaneously with an Amplatzer Duct Occluder (size: 10-8 mm) (Figure 1 C). After the successful implantation, no complications or residual shunt were found.

The Gerbode defect is a rare form of ventricular septal defect (VSD) that allows for communication between the left ventricle (LV) and RA. The congenital form of the LV-RA shunt is uncommon and the incidence is 0.08% of all catheterized congenital defects. Anatomically, two types of Gerbode defect are defined, supravalvular (less common) and subvalvular, depending on whether the defect in the membranous septum is above or below the tricuspid valve. Shunting from the LV to the RA mainly occurs in systole, resulting in a high-velocity jet by spectral Doppler between these chambers [1–3]. The LV-RA shunt is traditionally corrected surgically, but device closure is more comfortable new method. Six case reports of successful transcatheter closure in adults have been reported in the literature. Five pa-

Figure 1. A – 2D TTE revealed tunnel-like appearance of Gerbode defect between LVOT and RA in parasternal short-axis view (see arrow). **B** – Color Doppler echocardiography demonstrated clear systolic jet directed from the LVOT to the RA (see arrow). **C** – 2D TTE demonstrated the defect successfully closed with an Amplatzer occluder (see arrow)

RV – right ventricle, LVOT – left ventricular outflow tract, 2D TTE – two-dimensional transthoracic echocardiography.

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Received: 23.12.2014, **accepted:** 8.04.2015.

tients were over 60 years old, and one patient was 22 years old. Five of these cases were performed after mitral valve surgery, and one was performed after VSD repair. Three communications were closed with Amplatzer duct occluders (ADO), one with VSD, and two with atrial septal defect occluders. Residual shunt of only trivial to mild degree was noted in four of those 6 cases. There were no major complications. All reported cases of catheter-based closure seemed to have 100% survival based on reviewing these case reports [4].

Conflict of interest

The authors declare no conflict of interest.

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