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Percutaneous Closure of "tunnel shaped" ventricular septal defect using the Amplatzer Vascular Plug II in pediatric patient

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Introduction: Surgical closure is still considered the gold standard treatment of Ventricular Septal Defects (VSDs). Nevertheless some defects, such as apical muscular VSDs, are poorly accessible for traditional surgical approach. With introduction of Amplatzer VSD occluder devices (AGA Medical Corp., Golden Valley, MN, USA), VSDs trancatheter occlusion appears to be a valid alternative to cardiac surgery. However, tunnel-shaped VSDs are difficult and challenging to close with Amplatzer VSD occluder device (AGA Medical Corp., Golden Valley, MN, USA) due to the not appropriate device morphology. We report the first successful closure of a large tunnel-shaped apical muscular VSD with an Amplatzer vascular plug II (AVP II- AGA Medical Corp., Golden Valley, MN, USA) in a 27 month-old female patient.
Methods: A 27 month-old, 7.3 kg baby-girl was accepted at our institution for multiple VSDs. Echocardiographyc evaluation showed a large perimembranous VSD (p-VSD) and an apical muscular VSD (m-VSD). M-VSD closure was considered to be challenging with traditional surgery. We decided to close m-VSD percutaneously. Right and left heart catheterization were performed and the apical m-VSD size was measured after left ventricular (LV) angiography. The m-VSD appeared to be "tunnel shaped", similar to a cylindrical vascular structure, therefore, we selected for closure an AVP II (AGA Medical Corp., Golden Valley, MN, USA), a cylindrical self expandable occlusion device which is usually used for transcatheter embolization of unwanted blood vessel. The patient underwent p-VSDs surgical closure the day after.
Results: AVP II (AGA Medical Corp., Golden Valley, MN, USA) was correctly deployed and immediate post-procedure LV angiography showed trivial residual shunt. The patient remains symptom free with optimal combined procedure result, at 6 months follow-up.
Conclusion: A combined surgical and percutaneous procedure can be an easier and safer alternative to surgical closure only in selected VSDs cases . AVP II appears user- and patient-friendly device also in positions and in conditions for which it has not been designed ensuring an excellent procedural result.