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Case report

Percutaneous VSD closure of a baby weighed 3 kg☆

Nazmi Narın, Ozge Pamukcu *, Suleyman Sunkak, Kazim Uzum, Ali Baykan

Erciyes University School of Medicine, Div. of Pediatric Cardiology, Turkey

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Introduction

The incidence of muscular VSD of 2.7 cases per 1000 live births.[1] The expected fate of muscular Ventricular Septal Defects (VSD) is that they decrease in size and finally close. Ventricular myocardium grows and fills the defect therefore small sized VSDs close spontaneously. It was reported that 33% of VSD closed in utero, 44% within the first postnatal year, and 23% did not close.[2] Large muscular defects if not treated may cause pulmonary hypertension and may affect the growth of children. Surgery can be an option but because of their location it is very hard to find such defects and approach because of coarse trabeculations. Therefore, firstly hybrid approaches, later percutaneous closures are done for treatment. Various devices are used for this purpose, nowadays Amplatzer Duct Occluder (ADO) II are common.

Case

Two months old baby was referred to our clinic with tachypnea, tachycardia and growth failure. She was born 2800 g 30 weeks of gestation and now she is 3000 g. Her mother recognized that she had dyspnea during feeding and irritable. Pansystolic murmur 2–3°/6 in degree was found by physical examination. Telecardiography showed mild cardiomegaly. Apical 4 mm large VSD was detected in the echocardiography, left side of heart was enlarged. 20 mm Hg gradient was detected between two ventricles. Tricuspid insufficiency was 2nd degree. Anti-congestive treatment was started but despite to the treatment, her symptoms continued. She failed to gain weight and hospitalized for lower respiratory tract infections twice. Surgical closure was discussed with the family and the surgeons but because of VSD location is apical which is hard to localize during surgery and the bodyweight of patient was low it was decided that morbidity and mortality of surgery would be high. Family was informed about percutaneous closure procedure; its risks, benefits and they accepted Transcatheter closure. After left ventriculography, we decided to close the defect from left ventricle side. The VSD was passed through by using a partly cut pigtail catheter. A hydrophilic glide wire was passed across the defect into the right ventricle and the defect was closed by 5 × 4 ADO II AS (St. Jude Medical, Plymouth, MN) device (Fig. 1). We did not face any complications like atrioventricular block during or after the procedure. No vascular complication was seen up till now. In control transthoracic echocardiography no aortic or tricuspid insufficiency was detected. She was discharged on the next day after the procedure (Fig. 2).

Discussion

Surgery is not the choice for the closure of muscular and apical VSDs because risk of residual shunting and reoperation is high. In each intervention mortality and morbidity increases.[3–5] Transcatheter closure of VSD is performed successfully in older children for years. Percutaneous VSD closure has certain risks like complete heart block, aortic, tricuspid insufficiency. In order to minimize such risks; appropriate device should be selected according to the type, location, and the size of the defect. Amplatzer muscular VSD occluders were used as device, later Amplatzer duct occluders (ADO) have been started to be used. ADO II was safe and effective for aneurysmatic perimembranous VSD closure as shown before.[6]

Transcatheter retrograde closure of VSD with ADO II (like our case) is possible and mentioned in the literature previously.[7] Also additional risks were found in infancy period like sheath size, stiffness of delivery. Diab et al.[8] reported the largest series of infants <1 year of age whose muscular VSD were closed with device. The smallest patient that they closed the VSD was 3.2 kg with periventricular and 3.8 kg with percutaneous approach. Zartner et al.[9] reported transvascular closure of single and multiple muscular VSDs in neonates and infants < 20 kg. They were able to close VSD by percutaneous approach in infants as small as 2.2 kg. However acute complete atrioventricular (AV) block occurred, the device was removed immediately. Then AV block was resolved and surgical closure was performed.

The smallest case was reported by Polat et al. They reported percutaneous closure of 13 days old newborn weighed 2.9 kg.[10]

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* Corresponding author.
E-mail address: opamukcu@erciyes.edu.tr (O. Pamukcu).

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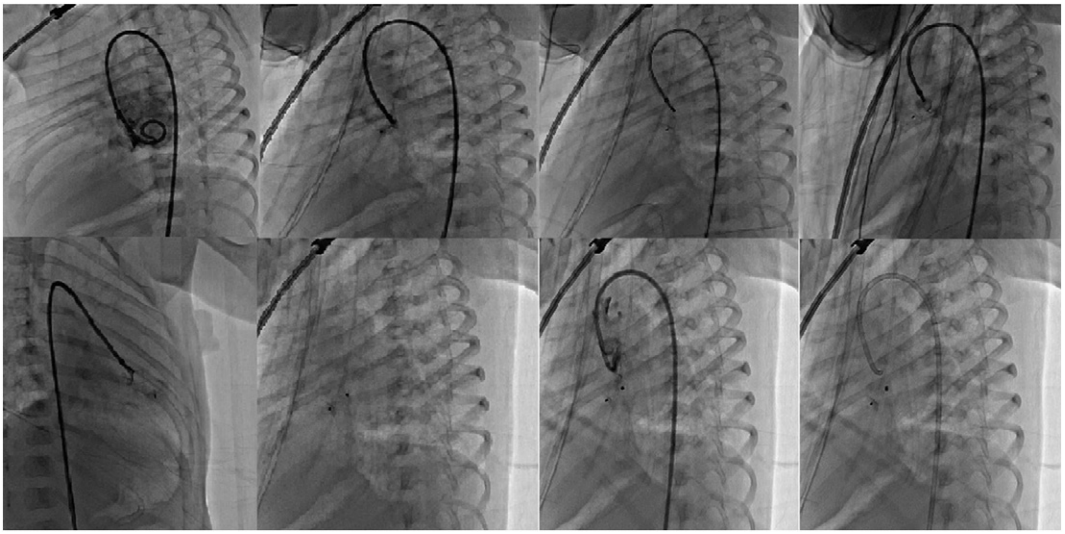

Fig. 1. Angiography images of percutaneous VSD closure.

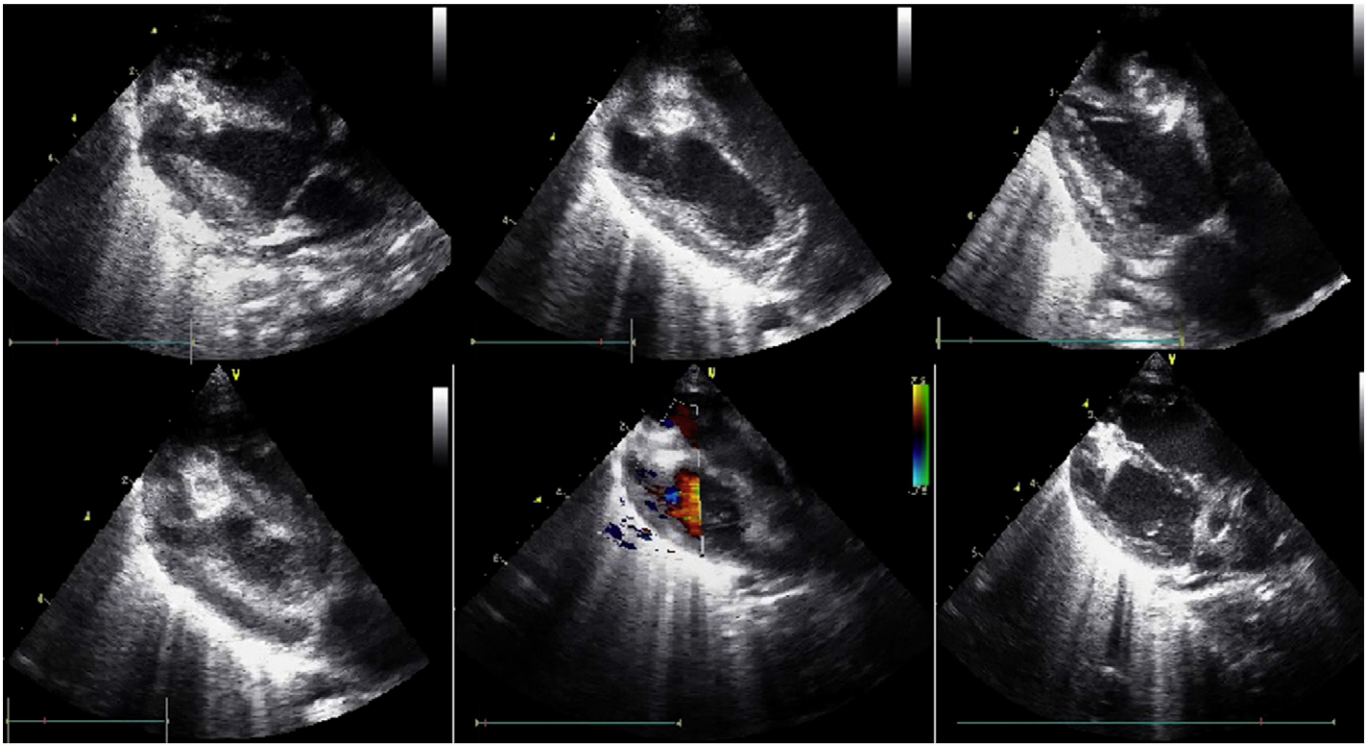

Fig. 2. Transthoracic echocardiography images after VSD closure.

Conclusion

We emphasized that firstly; if appropriate device with appropriate size was used with good technique in experienced hands percutaneous muscular VSD closure is a safe procedure second; this can be done with ADO 2 device form left ventricle side easily.

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