Anadolu Kardiyol Derg
2012; 12: 361-7

Closure of nonrestrictive aortopulmonary window in an infant by the transcatheter approach

Transkateter yaklaşımla bir süt çocuğunda nonrestriktif aortopulmoner pencerenin kapatılması

Introduction

Aortopulmonary window (APW) is a relatively rare congenital disease consisting of a septal defect between the ascending aorta and the pulmonary artery, creating a left-to-right shunt (1-4). Reports on transcatheter treatment of the condition are limited to a small number of cases. We present the case of a 10-month old child who was diagnosed with APW after consulting for recurrent lower respiratory tract infection and was treated by the transcatheter approach.

Case Report

A ten months old male patient weighting 8 kg had been consulted with a history of recurrent lower respiratory tract infection since one month of age. A 2/6 systolic murmur along the left upper sternal border was heard at physical examination; cardiomegaly and an increase of pulmonary vascularity were observed with the help of telecardiography. Echocardiographic investigation showed left and right ventricle enlargement, and 8-mm defect between the ascending aorta, and the pulmonary artery and pulmonary arterial hypertension (PAH).

During the angiographic examination, performed in the anteroposterior and right anterior oblique (RAO) projections, the contrast medium filled not only the aorta and its branches but, through the defect between the aorta and the pulmonary trunk, also filled this latter and its branches (Video 1. See corresponding video/movie images at www.anakarder.com). It was decided to occlude the defect; whose measured diameter was 8 mm, pulmonary artery pressure was 70 mm Hg and Qp/Qs ratio of 2.2.

Following entry by the left femoral access, the defect was passed in retrograde direction with a 0.035-inch hydrophilic guidewire; an arteriovenous circuit was created by catching the guidewire in the superior vena cava (SVC) with the help of a snare. A 12/10 Amplatzer duct occluder device was adjusted from the venous side into the ascending aorta, the flange was opened in the aorta and the tubular part of the device was opened inside the defect by retracting the sheath. The device was set free after following verification by transthoracic echocardiography of the device position, its distance to the coronary arteries and pulmonary valves and the size of the residual shunt. Right ventricular pressure fell from 70 mm Hg before the procedure to 47 mm Hg after it. Angiographic control in the RAO projection ten minutes after the end of the intervention showed properly placed device, with total disappearance of the aortopulmonary shunt and filling of the left coronary (Video 2).

Discussion

Aortopulmonary window is a rare abnormality, first described in 1830 by Elliotson, with the incidence of less than 1% of all congenital cardiac disease (5). It is the result of incomplete separation of the aortopulmonary trunk, even though the differentiation of the semilunar valves is completed; the presence of the semilunar valves is necessary to differentiate diagnosis from persistent truncus arteriosus (6).

Anatomically, the most favorable patients for trans-catheter occlusion are those with small defects situated midway between the pulmonary artery bifurcation and the semilunar valves, away from the left coronary artery ostium and the semilunar valves (4, 7, 8). The percutaneous placement of a device was preferred for our patient because of the localization and size of the defect.

A small number of cases presenting trans-catheter occlusion of APW has been published. We attribute this situation to the rarity of the condition. The youngest patient, whose case of published case of percutaneous occlusion was published, was four months old (2). Duct occluder and septal occluder devices are preferable to use with the trans-catheter method, although Rashkind double umbrella devices are also occasionally used (2, 8, 9). An Amplatzer duct occluder was chosen for our patient, too. While following occlusion by the trans-catheter approach, it must be verified that the blood flow in the left coronary is not blocked. We performed a control injection of contrast medium to document that the left coronary was filling normally.

Conclusion

We would like to stress the fact that in selected cases the trans-catheter approach, which necessitates no cardiopulmonary bypass, shorter hospitalization and results in a better cosmetic effect, is an effective alternative to surgery.

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Video 1. Angiographic appearance of the defect

Video 2. Defect closure by the Amplatzer duct occluder is visible

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Available Online Date/Çevrimiçi Yayın Tarihi: 13.04.2012

doi:10.5152/akd.2012.104