

Transcatheter intervention for double-steal syndrome from isolation of the subclavian artery associated with patent ductus arteriosus

Isolation of the subclavian artery is a rare aortic arch anomaly, in which the left subclavian artery (LSCA) does not originate from the aortic arch and is connected to the pulmonary artery, through the arterial duct. A five-year-old girl, with left-arm claudication symptoms and a diagnosis of patent ductus arteriosus (PDA), was referred for interventional PDA closure. Blood pressure measurement showed that her right-arm systolic pressure was 30 mm Hg higher than that of her left arm. An unusual PDA was detected on echocardiography. During catheter angiography, a right-sided aortic arch was observed, and injection into the right vertebral artery (RVA) demonstrated a retrograde flow, down the left vertebral artery (LVA) to the LSCA, PDA, and pulmonary artery (Videos 1 and 2). The patient had a pathology resulting in double-steal syndrome, from the LVA to the left arm and the pulmonary artery. PDA closure was planned to eliminate the pulmonary artery steal. However, passing the PDA through the antegrade route was not possible. The PDA was closed with an Amplatzer duct occluder type II device, via the retrograde route (Videos 3–7). After 1 month, pain in the left arm was decreased. When coarctation is not detected in a patient with PDA, an isolated LSCA should be considered, particularly when the left upper extremity blood pressure is low. Due to subclavian steal syndrome, the PDA closure using the transcatheter intervention and disconnecting the subclavian artery from the pulmonary artery represents a safe therapeutic alternative to surgery in patients without critical extremity ischemia.

Informed consent: Informed consent was obtained from the patient's parents.

Video 1. Catheter angiography, demonstrating a right-sided aortic arch. The left subclavian artery was opacified later.

Video 2. Catheter angiography, showing an injection into the right vertebral artery, which fills the left vertebral artery via a connection between the arteries, before forming the basilar artery. The left vertebral artery is filling both the left subclavian artery and the patent ductus arteriosus.

Video 3. Catheter angiography, demonstrating the right vertebral artery (RVA), which was reached retrograde from the arterial pathway. A 0.014" soft coronary guidewire was pushed forward from the RVA into the left vertebral artery, via the connection between the arteries

Video 4. After passing the coronary guidewire in a retrograde manner, the wire was snared via an antegrade route in the pulmonary artery, and the arteriovenous loop was formed.

Video 5. Catheter angiography image, showing an injection into the subclavian artery with a 5F JR4 catheter sent over the created arteriovenous loop.

Video 6. Catheter angiography shows the antegrade injection into the pulmonary artery, which demonstrated the patent ductus arteriosus closure using Amplatzer duct occluder type II. The steal was decreased to the pulmonary artery.

Video 7. Catheter angiography, demonstrating the retrograde injection into the right vertebral artery, which fills the left vertebral artery and the left subclavian artery. The flow to the left subclavian artery increased.

 **Bekir Yükcü**,  **Fatma Sevinç Şengül**,  **Alper Güzeltaş**
Department of Pediatric Cardiology, University of Health Sciences, Istanbul Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital; Istanbul-Turkey

Address for Correspondence: Dr. Alper Güzeltaş,

Sağlık Bilimleri Üniversitesi,
 İstanbul Mehmet Akif Ersoy
 Göğüs Kalp ve Damar Cerrahisi
 Eğitim ve Araştırma Hastanesi,
 Çocuk Kardiyoloji Kliniği,
 Halkalı/Küçükçekmece,
 İstanbul-Türkiye

Phone: +90 212 692 20 00

E-mail: alperguzeltas@hotmail.com

©Copyright 2020 by Turkish Society of Cardiology - Available online at www.anatoljcardiol.com

DOI:10.14744/AnatolJCardiol.2020.51481

Intra-atrial path of the right coronary artery: An infrequent and still unknown anomaly

Coronary congenital anomalies are rare. Most are benign, but some can cause myocardial damage or sudden death. With the advancement of imaging studies, its diagnosis is increasing. We present a series of three cases in which the right coronary artery has an intra-auricular path. We examined a middle-aged man and two women with no cardiovascular history. They consulted a doctor for chest pain. Conventional ergometry and transthoracic echocardiography were performed and revealed normal results. Due to persistence of the symptoms, a computed tomography of the coronary arteries is requested. There were no significant atherosclerotic lesions found; however, an abnormality was found. Anatomical characteristics were evaluated using conventional axial images and curved multiplanar reconstructions, with retrospective acquisition and single injection of contrast (Fig. 1 and 2). The abnormality is diagnosed by evaluating that any segment of the artery is completely surrounded by blood in the right atrium. The artery originates from the right Valsalva sinus, with the junction of the proximal and middle thirds being affected. It crosses