

Surgical Therapy of an Aberrant Origin of the Left Anterior Descending Coronary Artery from the Right Sinus of Valsalva: A Case Report

Christian Schreiber,¹ Manfred Vogt,² Andreas Eicken,² Zsolt Prodan,¹ Paul Libera,¹ Rüdiger Lange¹

¹Cardiovascular Surgery, German Heart Center Munich at the Technical University; ²Department of Paediatric Cardiology and Congenital Heart Disease, German Heart Center Munich at the Technical University, Munich, Germany



ABSTRACT

Anomalous aortic origin of a coronary artery from the incorrect coronary sinus of Valsalva is a rare congenital cardiac defect that is associated with an increased risk of sudden death. In most of these defects, the anomalous coronary artery takes an intramural course between the great arteries and leaves the aortic wall from the appropriate coronary sinus of Valsalva. Many times this anomalous artery shares a common orifice with the other coronary artery. We report on a previously healthy 15-year-old boy who presented with signs of an anterolateral myocardial infarction after physical activity (soccer game). Transthoracic echocardiography revealed an aberrant origin of the left anterior descending coronary artery from the right sinus of Valsalva. Repair was accomplished by unroofing the intramural segment. Because the intramural segment was below the commissure, detachment of the intercoronary commissure was not necessary. To conclude, transthoracic echocardiography can accurately depict this rare anomaly, and in symptomatic patients surgical therapy is indicated.

INTRODUCTION

Anomalous aortic origin of a coronary artery from the right coronary sinus of Valsalva is a rare congenital cardiac defect. Sudden death can occur preferentially in young, asymptomatic athletes [Cheitlin 1974; Yamanaka 1990; Maron 1996]. In most of these defects, the anomalous coronary artery takes an intramural course between the great arteries and leaves the aortic wall from the appropriate coronary sinus of Valsalva. Many times this anomalous artery shares a common orifice with the other coronary artery. The combined incidence of these defects approximates 0.17% in

autopsy series and 0.1% to 0.3% in patients undergoing catheterization or echocardiography.

CASE REPORT

A previously healthy 15-year-old boy presented with signs of an anterolateral myocardial infarction after physical activity during a soccer game. Echocardiography revealed an aberrant origin of the left anterior descending (LAD) coronary artery from the right sinus of Valsalva (Figures 1 and 2).

Surgical repair was carried out as initially described by Mustafa and colleagues [Mustafa 1981]. After the heart was arrested with cold crystalloid cardioplegia, aortotomy was performed. Repair was accomplished by unroofing the intramural segment. Because the intramural segment was above the sinotubular junction, detachment of the intercoronary commissure was not necessary (Figures 3 and 4, Movie). The postoperative course was uneventful. Upon an electrophysiological study any arrhythmia was excluded. Cardiac catheterization on this occasion demonstrated unrestrictive blood flow to the LAD.

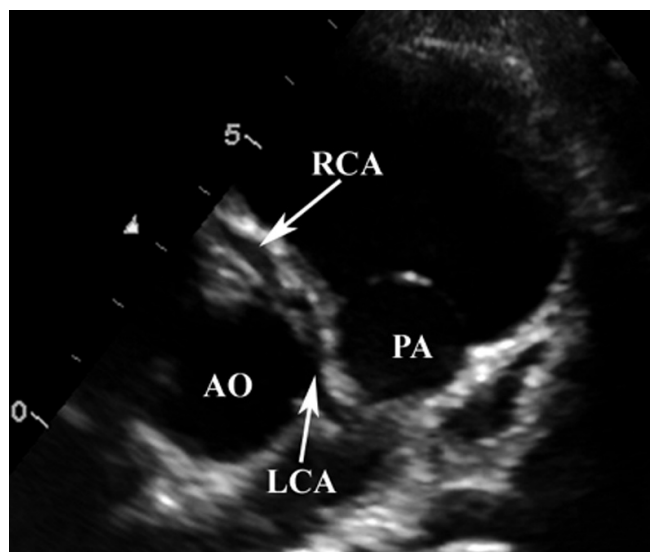


Figure 1. Transthoracic echocardiogram, short axis view. AO indicates aorta, PA; pulmonary artery; RCA, right coronary artery; LCA, left coronary artery.

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Address correspondence and reprint requests to: Christian Schreiber, MD, PhD, German Heart Center Munich, Clinic of Cardiovascular Surgery at the Technical University, Lazarettstrasse 36, 80636 Munich, Germany; 49-(0)-89-12184111; fax: 49-(0)-89-12184113 (e-mail address: schreiber@dbm.mbn.de).

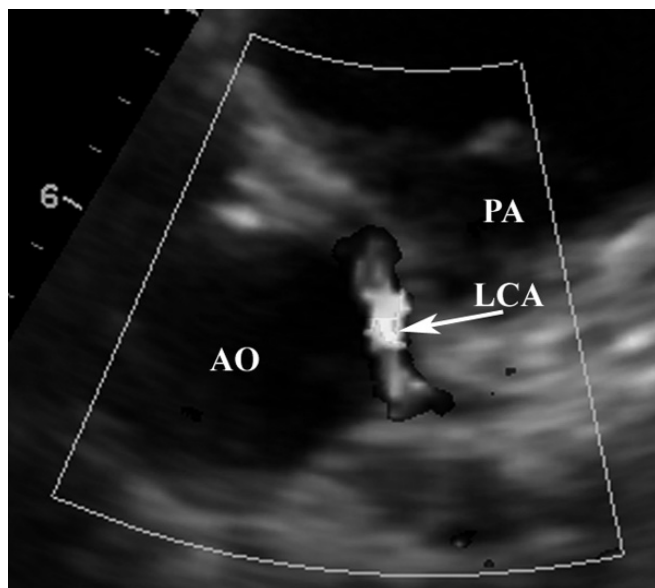


Figure 2. Corresponding short axis view showing flow in the intramural portion of the left coronary artery.



Figure 3. View after unroofing the intramural segment (above the sinotubular junction).

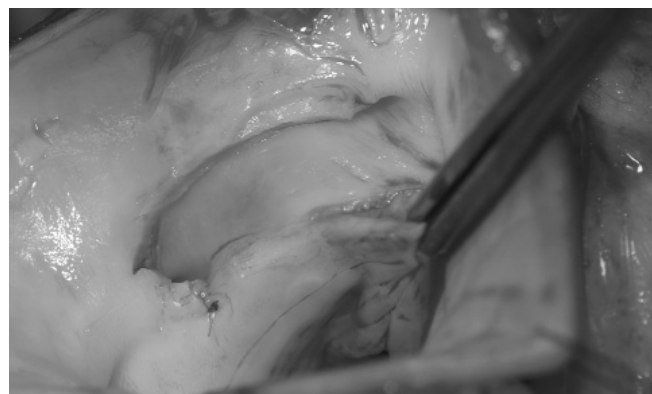


Figure 4. View into the newly created "true" ostium of the left anterior descending artery.

DISCUSSION

Transthoracic echocardiography can accurately depict this rare anomaly, and in symptomatic patients surgical therapy is indicated. The pathophysiology of compromised coronary blood flow has many possible mechanisms. These may include (1) compression of the intramural segment between the pulmonary artery and aorta, and (2) narrowing of the slit-like orifice together with its acute angle of the take-off with increased pressures. Many surgical strategies have been suggested, including coronary reimplantation, creation of a neo-ostia, coronary artery bypass grafting, or the described unroofing of the intramural segment.

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