International Journal of Cardiology 127 (2008) 280–283

International Journal of Cardiology

www.elsevier.com/locate/ijcard

Letter to the Editor

Anomalous origin of the right coronary artery from the left anterior descending artery in a patient with single left coronary artery: A rare coronary artery anomaly and review of the literature

Okan Erdogan *, Mutlu Buyuklu, Meryem Aktoz

Department of Cardiology, School of Medicine, Trakya University, Edirne, Turkey

Received 5 February 2007; accepted 25 April 2007
Available online 20 July 2007

Abstract

A 44-year-old woman with hypertension was admitted because of recent onset chest pain. Coronary angiography revealed an anomalous right coronary artery originating as a separate branch from the left anterior descending artery. Associated with the present case all published case reports were thoroughly investigated and presented as a review of the literature.

Keywords: Coronary artery anomaly; Right coronary artery; Left anterior descending; Coronary angiography

1. Introduction

Although all coronary artery anomalies are present at birth, most of these are found incidentally during coronary angiography. Coronary artery anomalies are detected during 1.3% of routine cardiac catheterizations and in rare cases have been associated with myocardial ischemia [1]. Anomalous origin of the right coronary artery (RCA) from the left anterior descending coronary artery (LAD) is relatively uncommon [2–13]. Recognition and identification of these anomalies is of clinical importance because of their possible confusion with occlusive coronary disease and because they can occasionally cause symptoms. We present here a patient with a single left coronary artery and associated anomalous origin of RCA from the proximal LAD.

2. Case

A 44-year-old woman with hypertension was admitted for evaluation of recent onset chest pain. Physical examination was unremarkable and resting ECG was normal. Transthoracic echocardiography showed normal left ventricular dimensions and 70% ejection fraction. Coronary angiography was performed through the right femoral artery using Judkin's technique. Multiple attempts to cannulate a right coronary ostium were unsuccessful and an aortic root injection confirmed its absence. The left coronary ostium was located normally in the left sinus of Valsalva. Selective left coronary arteriography displayed normal courses of the left main and LAD associated with a critical stenosis in mid-circumflex artery. An anomalous RCA, as a separate branch arose from the mid-portion of LAD distal to diagonal artery and coursed anterior to the pulmonary artery down to the right atrioventricular groove (Figs. 1–4). Since the patient denied any intervention and further diagnostic tests such as myocardial perfusion scintigraphy or multi-slice computed tomography, she was discharged on carvedilol, candesartan, rosuvastatin and aspirin therapy.

3. Discussion

Yamanaka and Hobbs [1] reported the largest series about the incidence of coronary artery anomalies (1.3%) and anomalous RCA (0.26%) in 126,595 American people.

* Corresponding author. Trakya Üniversitesi Tıp Fakültesi, Kardiyoloji ABD, 22030 Edirne, Turkey. Tel.: +90 284 235 7641; fax: +90 284 235 2730.
E-mail address: okanerdogan@yahoo.com (O. Erdogan).

0167-5273/$ - see front matter © 2007 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.ijcard.2007.04.121

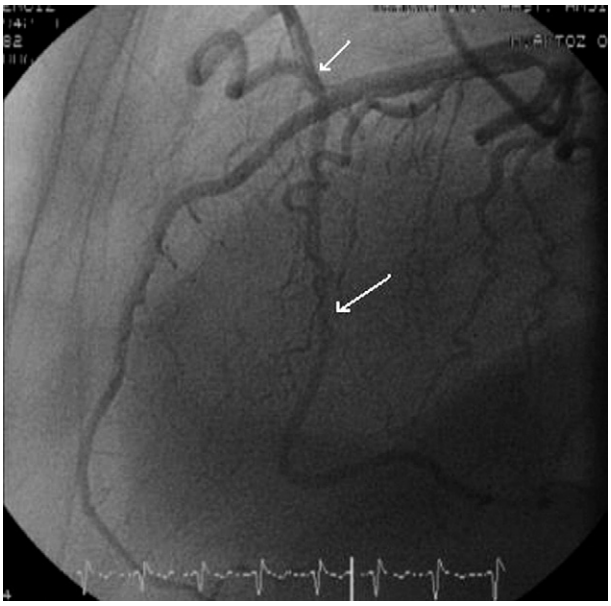

Fig. 1. Left lateral (100°) view of selective left coronary arteriography demonstrating anomalous RCA (arrows) from mid-LAD.

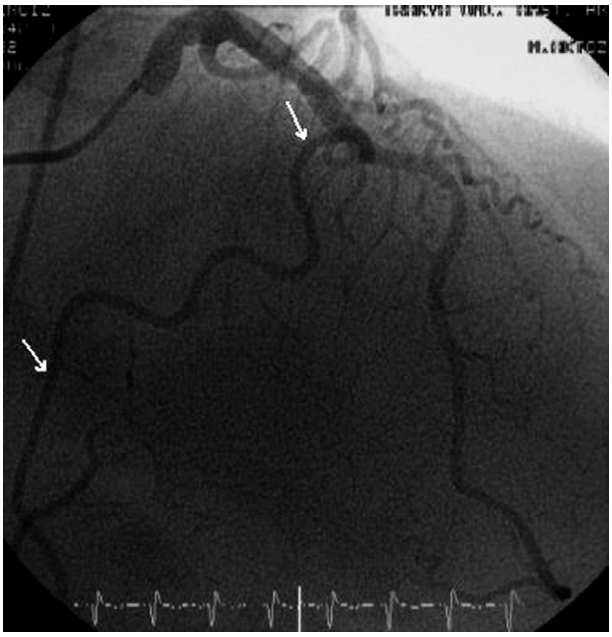

Fig. 3. Right anterior oblique (20°) and cranial (40°) view of anomalous RCA (arrows) from mid-LAD.

However, they did not mention of an anomalous RCA arising from the LAD as a separate branch. Most of the coronary anomalies remain asymptomatic and are found as an incidental finding with coronary angiography. Myocardial perfusion can be affected, extending from exertional angina to sudden death in different subtypes of these anomalies, such as a coronary artery arising from the pulmonary artery and a single coronary artery arising from either the left or right sinus of Valsalva [1,14,15]. Although the exact pathophysiological basis of angina, myocardial infarction or sudden death is unclear in cases of single coronary artery without obstructive lesion arising from either the left or right sinus of Valsalva, it might be related to mechanical compression of the anomalous coronary artery between the aorta and pulmonary root or great vessels, especially during exercise [1,14,15]. It is well established that the origin of the left main coronary artery from the right side with subsequent coursing between the aorta and pulmonary trunk is associated with sudden death [8]. However, the

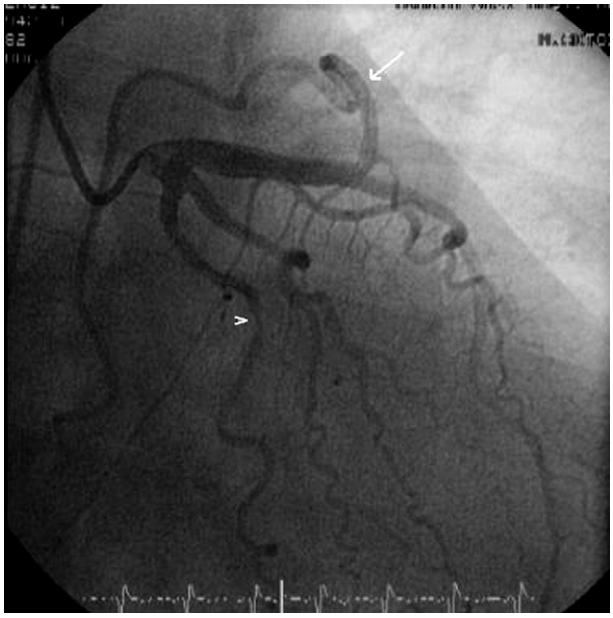

Fig. 2. Right anterior oblique (30°) and caudal (15°) view of anomalous RCA (arrow) from mid-LAD and critical stenosis in mid-circumflex artery (arrow head).

Fig. 4. Left anterior oblique (45°) view of aortic root angiography revealing absence of normal RCA origin from the right sinus of Valsalva and silhouette of anomalous RCA from mid-LAD (arrows).