An unusual etiology of ischemic stroke: Woven coronary artery anomaly

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Woven coronary artery is extremely rare and is still not a clearly defined coronary anomaly in which epicardial coronary artery is divided into multiple thin channels at any segment of the coronary artery, and subsequently, these multiple channels merge again in a normal conduit. The described cases were usually incidentally detected and were considered a benign pathology. But, malignant cases with developing complications such as ischemia, infarction, and arrhythmia are increasing in the literature. In this report, we present a young man with a woven right coronary artery associated with a silent myocardial infarction, inferobasal segment acinesia, an area of scarring, and cardioembolic stroke thought from the scar area. Although it is reported as a benign coronary anomaly in the literature, we should be careful especially in terms of the complications that it causes.

Keywords: Inferobazal-segment acinesia, Ischemic stroke, Woven coronary anomaly

Introduction

Woven coronary artery is an extremely rare and still not clearly described coronary anomaly. The epicardial coronary artery is divided into multiple, thin channels at any segment of the coronary artery, and subsequently, these multiple channels merge again into a normal conduit [1,2]. A few cases have been reported, and were usually incidentally detected. It is typically considered a benign pathology, with lesions in a few centimeters of the segment and not corrupting the coronary flow [2,3]. However, there have also been cases with a malignant course, developing complications such as ischemia, infarction, and arrhythmia [2,4–8].

In this report, the case of a man with woven right coronary artery associated with myocardial infarction, inferobasal segment akinesia, an area of scarring, and cardioembolic stroke thought to have occurred as a result, is described.

Case report

A 41-year-old male patient presented at the emergency service with the complaint of numbness on his left side, loss of strength in his left

Disclosure: Authors have nothing to disclose with regard to commercial support.
Received 5 January 2018; revised 21 April 2018; accepted 4 May 2018.

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Peer review under responsibility of King Saud University.
URL: www.ksu.edu.sa
https://doi.org/10.1016/j.jsha.2018.05.001

Production and hosting by Elsevier

J Saudi Heart Assoc
2018;30:316–318

arm and leg, nausea, vomiting, and drooping of the mouth. The patient was administered 100 mg of alteplase (tissue plasminogen activator) over 2 hours with diagnosis of acute ischemic stroke. Brain magnetic resonance and tomographic imaging suggested stroke of embolic origin. The patient was followed-up in the neurology department with respect to etiology. No plaque or stenosis was detected in the carotid arteries or the aorta of the patient, who had no known risk factor. The patient's thrombophilia tests were normal; tests for FV-PTH-MTHFR gene mutations and antiphospholipid syndrome were negative. Sinus rhythm was detected on electrocardiography exam, and Q wave was observed in the inferior derivations. Sinus rhythm was also detected on Holter monitor (SpiderView() ELA Medical, France) recording. Echocardiography determined ejection fraction to be 40%, and akinetic inferior and inferobasal walls, mild mitral regurgitation, and intact interatrial septum were observed. Left atrial appendix thrombosis was not detected on transesophageal echocardiography. As thrombus was not seen in the left ventricle on echocardiography, it was considered that thrombosis developed in the akinetic segment, leading to cardioembolic ischemic stroke. Coronary angiography showed woven coronary artery anomaly in the right coronary artery, and inferior, inferobasal segment akinesis in the left ventriculography (Fig. 1A–C and Video 1). Inferior wall fixed hypoperfusion, infarct and mild periinfarct ischemia were detected on myocardial perfusion scintigraphy, therefore, percutaneous intervention was not considered. The patient was treated with anticoagulation and medical therapy, and he was referred to physical therapy for neurological sequelae. The patient was followed up for 2 years and has had no further cardiac symptoms, apart from only mild neurological sequelae.

Discussion

The etiology of woven coronary anomaly, in which the epicardial coronary arteries are separated into strands and resemble braided hair, is unclear [1,3]. It is usually detected incidentally during coronary angiography, and is mostly seen in males (male/female ratio: 10/1) [2]. The right coronary artery is more frequently affected [2]. Woven coronary anomaly can be confused with recanalized thrombus, spontaneous coronary dissection, and bridge collaterals [2,9,10]. Cases have been reported in which woven coronary anomaly formed as a pathophysiological result of recanalized thrombus, spontaneous coronary, or dissection [4,9,10]. In another case, intact arterial wall structure accompanied by atherosclerotic plaque structure was visualized with intravascular ultrasound, although no thrombus or dissection structure was observed [5]. Congenital anomaly and malformation seem to be more convincing reasons for the development of woven coronary artery, according to the current literature [2].

Asymptomatic, long-term cases without a coronary issue have been reported in the literature [3,10]. However, the number of cases with acute

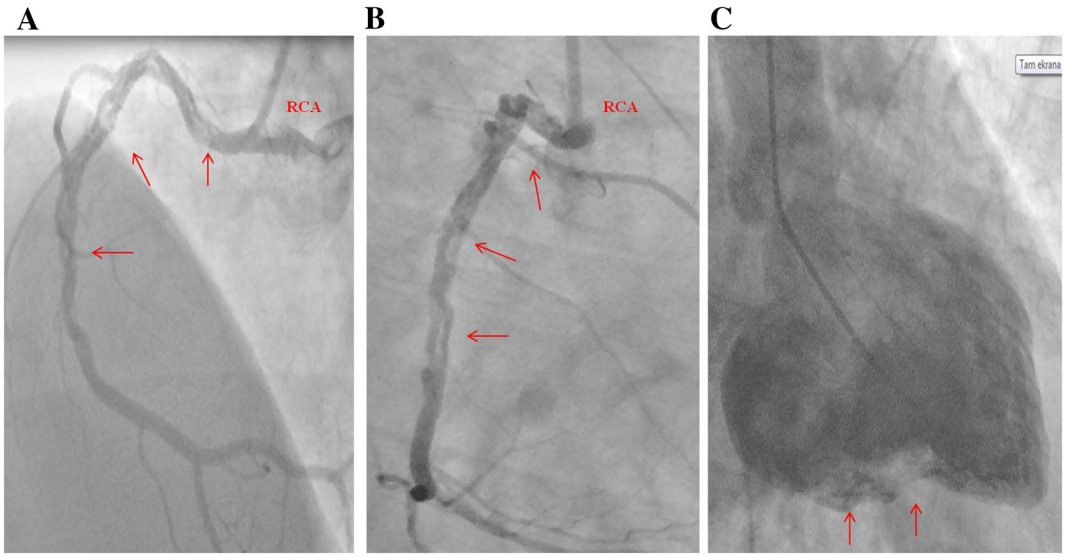

Figure 1. (A) Woven right coronary artery anomaly (right anterior oblique projection); (B) woven right coronary artery anomaly (left anterior oblique projection); (C) left ventriculography in right anterior oblique projection (arrow indicates inferobasal segment acinesia and no contrast matter). RCA = right coronary artery.

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2018;30:316–318

coronary syndrome, sudden cardiac death, and revascularized coronary ischemia leading to myocardial infarction, is increasing [2,3,6–10]. It was demonstrated in a postmortem case that a wide collagenous scar, amorphous basophilic material, and proteinaceous deposit accumulated in the myocardium tissue caused infarction [2]. In our case, when a man with ischemic stroke etiology was examined, myocardial infarction finding as well as inferior and inferobasal segment akinesia were detected. Woven right coronary artery was detected, which did not cause ischemic symptoms, but caused cardioembolic stroke due to myocardial infarction and scarring area. Although it is regarded as a benign coronary anomaly in the literature, because woven coronary artery can cause ischemia and infarction, it should be considered atherosclerotic heart disease in the treatment of related complications. In general, woven coronary artery is considered a benign anomaly, but it is increasingly reported with myocardial infarction, ischemia, sudden cardiac death, and other complications. Our case, in which woven coronary anomaly caused inferior, inferobasal infarct and in which scarring led to cardioembolic stroke, was unusual.

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