Woven Coronary Artery Anomaly Associated with Acute Coronary Syndrome

Selim Ayhan, MD¹ Serkan Ozturk, MD¹ Umit Yasar Tekelioglu, MD² Tarik Ocak, MD³

¹ Department of Cardiology, School of Medicine, Abant Izzet Baysal University, Bolu, Turkey

² Department of Anesthesiology and Reanimation, School of Medicine, Abant Izzet Baysal University, Bolu, Turkey

³ Department of Emergency Medicine, School of Medicine, Abant Izzet Baysal University, Bolu, Turkey

Address for correspondence Selim Ayhan, MD, Department of Cardiology, School of Medicine, Abant Izzet Baysal University, Gölköy yerleşkesi, 14280 Bolu, Turkey (e-mail: ssayhan@yahoo.com).

Int J Angiol 2013;22:55–58.

Abstract

Keywords

- woven coronary artery anomaly
- acute coronary syndrome
- cardiac arrest

The woven coronary artery anomaly is a rare congenital anomaly in which a coronary artery is divided into thin channels that merge again into the distal lumen. Only a few cases of woven coronary artery have been reported in the literature. This anomaly is accepted as a benign condition. We describe a case of acute coronary syndrome in a patient with woven coronary artery anomaly.

The woven coronary artery anomaly is a rare congenital anomaly in which a coronary artery is divided into thin channels that merge again into the distal lumen.¹ The etiology and pathogenesis of this anomaly is not fully known, but it is considered to be benign.² The segment with the anomaly is typically located within a few centimeters of the coronary artery and does not adversely affect blood flow in the distal coronary bed. The majority of these anomalies are detected incidentally during coronary angiography. Cases of woven coronary artery anomalies associated with acute coronary syndrome have not been reported in the literature. In this report, we describe a case of acute coronary syndrome and cardiac arrest where a woven coronary anomaly was detected in both the left anterior descending coronary artery and right coronary artery.

Case Report

A 42-year-old man was admitted to the emergency room after experiencing sudden discomfort in his chest while playing soccer and then losing consciousness. He presented to the emergency medical team in asystole, but returned to a normal sinus rhythm following ~10 minutes of lasting cardiopulmonary resuscitation. Relatives accompanying the patient did not know of any history of disease or drug use. Blood pressure was 70/50, pulse 120 beats/min. A 12-lead electro-

cardiogram showed sinus tachycardia, right bundle branch block with marked ST segment depression in precordial leads. Echocardiogram revealed global hypokinesis with left ventricular ejection fraction of 30%. Biochemical assessment showed values as follows: troponin I 180 ng/mL, creatinine kinase 15,677 U/L, creatinine kinase-MB 619 U/L, potassium 3.7 mmol/L, and creatinine 1.7 mg/dL. Normal anatomy was observed in the circumflex artery with coronary angiography. However, a structure dividing the arterial lumen into a large number of thin channels and noncritical stenoses was observed in the proximal and distal segments of the right coronary artery and in the proximal and middle segments of the left anterior descending coronary (► **Figs. 1** and **2**). Coronary flow in the distal segments of the diseased segments was normal. A woven coronary anomaly was diagnosed and angioplasty on the left anterior descending coronary artery was not considered for the patient. The patient was discharged from the hospital on the 38th day with neurological sequel (motor deficits and mild mental defect).

Discussion

Woven coronary artery anomaly was first defined in 1988 by Sane and Vidaillet and a limited number of cases have been

Fig. 1 Right anterior oblique projection showing thin channels in the proximal and middle segments of left anterior descending artery (arrows).

reported.¹⁻⁹ An isolated coronary anomaly has been reported only once in a 9-month-old infant with Kawasaki disease.⁶ Woven coronary abnormality is more frequently described in the right coronary artery and has been shown in the circumflex artery and left descending artery. This is the first report to describe a woven coronary anomaly in both the right and left anterior descending coronary arteries. In all reported cases, woven coronary artery was detected incidentally and regarded as a benign pathology since adverse events have not been reported in asymptomatic patients, even after 4 to 5 years of follow-up. However, some authors have suggested that the twisted structure of the thin channels in woven coronary artery may cause a thrombus.^{6,8} Recently, a woven right coronary artery was detected in a patient with a previous inferior myocardial infarction.⁹ The authors suggested that the right coronary artery was responsible and that

a woven coronary abnormality could be the basis for thrombus formation. We propose that this may have occurred in the present case, excluding the fact that our patient presented with acute coronary syndrome. Our findings strongly support this hypothesis.

The first step in diagnosing woven coronary anomaly is to identify a filling defect in the coronary artery lumen via coronary angiography. The diagnosis of woven coronary artery can be made when the proximal coronary artery is divided into thin channels which then reanastomose distally. However, these cases should be distinguished from cases with similar filling defects, such as the coronary dissection and recanalized thrombus, which have high incidence rates as compared with woven coronary abnormality. If the diagnosis of woven coronary artery is overlooked in these cases, patients may be exposed to unnecessary procedures and severe complications. Therefore, a careful examination of the angiographic images using digital zoom in suspected patients is very important. Further assessments of the thin channels in the coronary lumen using intravascular ultrasound can be useful in establishing a definitive diagnosis. Although all reported cases are asymptomatic, this anomaly in our case was shown to be associated with acute coronary syndrome. Thus, the prophylactic use of acetylsalicylic acid in patients with woven coronary anomaly may be reasonable. Although it is considered a benign pathology, a woven coronary anomaly can lead to life-threatening situations, such as the one reported here. It is also speculated that this coronary abnormality is associated with portion of sudden cardiac deaths. To avoid misdiagnosis and unnecessary angioplasty procedures, interventional cardiologists should keep this anomaly in mind and obtain optimal angiographic images. A prospective, randomized study of woven coronary artery is necessary to fully understand the natural course of this anomaly and develop treatment options.

Conflict of Interest

The authors have no conflict of interest to disclose.

Fig. 2 Right anterior oblique (a) and left (b) projections of the right coronary artery showing thin channels and distal reanastomosis (arrows).

References

- 1 Sane DC, Vidaillet HJ Jr. "Woven" right coronary artery: a previously undescribed congenital anomaly. *Am J Cardiol* 1988;61(13):1158
- 2 Gregorini L, Perondi R, Pomidossi G, Saino A, Bossi IM, Zanchetti A. Woven left coronary artery disease. *Am J Cardiol* 1995;75(4):311–312
- 3 Berman AD, Kim D, Baim DS. "Woven" right coronary artery: case report and therapeutic implications. *Cathet Cardiovasc Diagn* 1990;21(4):258–259
- 4 Martuscelli E, Romeo F, Giovannini M, Nigri A. Woven coronary artery: differential diagnosis with diffuse intracoronary thrombosis. *Ital Heart J* 2000;1(4):306–307
- 5 Kursaklioglu H, Iyisoy A, Celik T. Woven coronary artery: a case report and review of literature. *Int J Cardiol* 2006;113(1):121–123
- 6 Yıldırım A, Oğuz D, Olguntürk R. Woven right and aneurysmatic left coronary artery associated with Kawasaki disease in a 9-month-old patient. *Cardiol Young* 2010;20(3):342–344
- 7 Kaya D, Kilit C, Onrat E. An uncommon congenital anomaly of coronary arteries misdiagnosed as intracoronary thrombus: woven coronary artery disease. *Anadolu Kardiyol Derg* 2006;6(4):383–384
- 8 Iyisoy A, Celik T, Yuksel UC, Isik E. Woven right coronary artery: a case report and review of the literature. *Clin Cardiol* 2010;33(7):E43–E45
- 9 Soylu K, Meric M, Zengin H, Yüksel S, Kaya MG. Woven right coronary artery. *J Card Surg* 2012;27(3):345–346