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CE - MEDICAL ILLUSTRATION

Is every woven coronary artery benign? Case report

Xile Bi[1] · Hongmei Yang[1] · Li Liu[1] · Qingsheng Wang[1]

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Introduction

A 59-year-old man was admitted to our hospital with sudden persistent chest pain. His complaint was exertional angina occurring over the previous week. The patient had no cardiac risk factors, other than smoking. On physical examination, he had a blood pressure of 96/63 mmHg and a heart rate of 46 bpm. A 12-lead electrocardiogram showed sinus rhythm with marked ST segment elevation in the inferior leads. Echocardiogram revealed normal ventricular wall motion with a left ventricular ejection fraction of 59%. Biochemical assessment showed values as follows: troponin I 3.1 ng/mL and potassium 4.1 mmol/L. Left coronary angiography revealed an 80% stenosis in the proximal of left anterior descending (LAD) and normal anatomy in the left circumflex artery (LCX). However, right coronary angiography revealed a 100% occlusion before the posterior branch of the left ventricle. Beyond this occlusion, the main lumen was divided into several thin channels having a twisting course in the proximal and middle segments of the right coronary artery (Figs. 1, 2). The Swiss cheese-like structure of the woven coronary artery was observed by OCT (Fig. 3). The patient was successfully managed with CABG.

Woven coronary artery anomaly was first defined in 1988 by Sane and Vidaillet, and a limited number of cases have been reported [1]. In most reported cases, woven coronary artery is detected incidentally, and regarded as a benign pathology, since adverse events have not been reported. However, Yildirim et al., Iyisoy et al., Ayhan et al. and Soylu et al. have suggested that the twisted structure of the thin channels in woven coronary artery may cause a thrombus and sudden cardiac death [2–5]. The authors suggested theorize that a woven coronary artery abnormality might be the

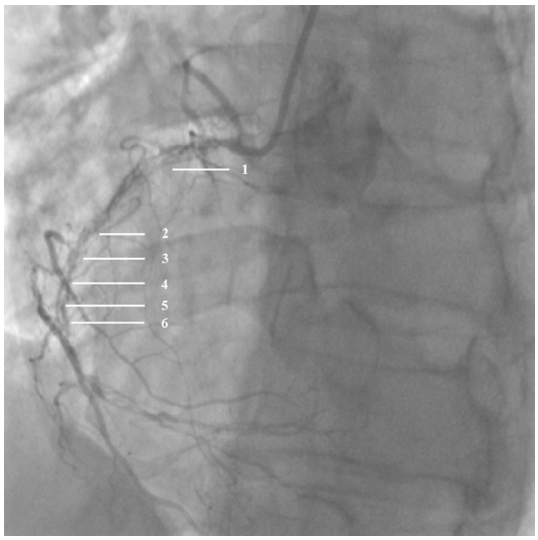

Fig. 1 Woven coronary artery anomaly in the right coronary artery and posterior branch of left ventricle occlusion

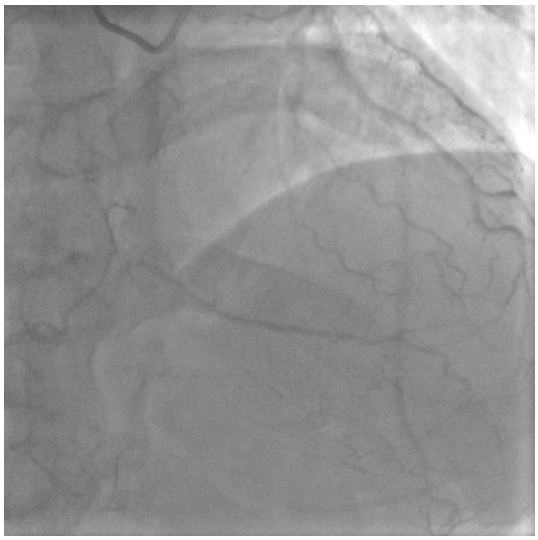

Fig. 2 The collateral circulation from the left circumflex artery

✉ Qingsheng Wang
qswang335@163.com

[1] Department of Cardiology, The First Hospital of Qinhuangdao, Qinhuangdao 066000, Hebei, China

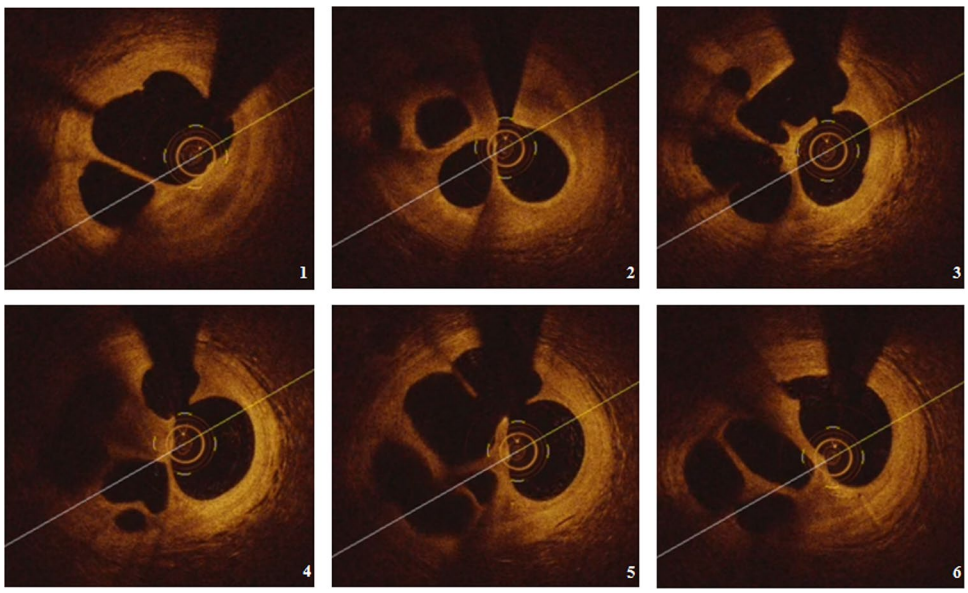

Fig. 3 OCT shows multiple cavities with blood

basis for thrombus formation. The pathology of this anomaly becomes clear with OCT observation of the coronary artery. OCT clearly distinguishes the recanalized thrombi by the unique features of multiple small channels, and reveals that these channels are interconnected, having been described as having a Swiss cheese appearance [6]. This vascular variation may lead to the formation of thrombosis. The mechanism of thrombi formation is either complete or ongoing [7]. Our findings strongly support this viewpoint. Moreover, the Swiss cheese-like structure of the woven coronary artery interferes with the laminar flow in the coronary arteries, and increases the shear forces on the arterial wall. This can exacerbate the process of coronary atherosclerosis, and lead to life-threatening situations. Because of OCT's better resolution, it can be used to clarify the pathology of woven coronary artery, and to potentially guide an optimal therapeutic approach. However, it may increase the difficulty of coronary intervention, and CABG may be the best alternate choice. This is the first report to describe a woven right coronary anomaly that was treated with CABG. Additionally, we could not determine the possible cause of the initial thrombotic occlusion, such as plaque rupture or spontaneous dissection, as the Swiss cheese-like structure had numerous locations for thrombus formation. We conclude that woven coronary artery is not a benign condition.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Statement of human and animal rights All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the author.

Informed consent Informed consent was obtained from all individual participants included in the study.

References

1. Sane DC, Vidaillet HJ Jr (1988) "Woven" right coronary artery: a previously undescribed congenital anomaly. Am J Cardiol 61:1158
2. Yildirim A, Oguz D, Olgunturk R (2010) Woven right and aneurysmatic left coronary artery associated with Kawasaki disease in a 9-month-old patient. Cardiol Young 20:342–344
3. Iyisoy A, Celik T, Yuksel UC, Isik E (2010) Woven right coronary artery: a case report and review of the literature. Clin Cardiol 33:E43–45
4. Ayhan S, Ozturk S, Tekelioglu UY, Ocak T (2013) Woven coronary artery anomaly associated with acute coronary syndrome. Int J Angiol 22:55–58
5. Soylu K, Meric M, Zengin H, Yüksel S, Kaya MG (2012) Woven right coronary artery. J Card Surg 27:345–346
6. Kang SJ, Nakano M, Virmani R, Song HG, Ahn JM, Kim WJ, Lee JY, Park DW, Lee SW, Kim YH, Lee CW, Park SW, Park SJ (2012) OCT findings in patients with recanalization of organized thrombi in coronary arteries. JACC Cardiovasc Imaging 5:725–732
7. Davlouros PA, Karantalis V, Mavronasiou E, Damelou A, Alexopoulos D (2011) Optical coherence tomography features of late-stage recanalised coronary thrombi. EuroIntervention 6:1022–1023