Anomalous Origin of the Left Coronary Artery from the Right Sinus of Valsalva, which Presented as Acute Myocardial Infarction

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ABSTRACT

Among all the congenital coronary anomalies, an anomalous origin of the left coronary artery (LCA) from the right sinus of Valsalva is rare. A 48-year-old male patient suffering with lateral acute myocardial infarction was referred for primary percutaneous coronary intervention. The initial angiogram failed to show the LCA, which originated from the right coronary sinus. A critical stenotic lesion was observed in the distal left circumflex artery. The lesion was treated successfully with stenting. We report here on a case of an anomalous origin of the left coronary artery from the right sinus of Valsalva, and the patient presented as acute myocardial infarction. He was successfully treated with primary percutaneous intervention. (Korean Circulation J 2006;36:817–819)

KEY WORDS: Myocardial infarction; Coronary vessel anomalies.

Introduction

Congenital coronary anomalies are presented in approximately 1% of the patients referred for cardiac catheterization. Among the congenital coronary anomalies, an separate anomalous origin of all the coronary arteries from the right sinus of Valsalva is very uncommon. We report here on a case of successful primary percutaneous coronary intervention (PCI) for acute myocardial infarction (AMI), and this was combined with an anomalous origin of the left coronary artery from the right sinus of Valsalva.

Case

A 48-year-old male patient with a history of hypertension and smoking visited the emergency room with complaints of severe chest pain that had lasted for 1 hour. His blood pressure was 150/90 mmHg. The initial electrocardiogram showed 2 mm of ST-segment elevation in leads I and aVL, and 2 mm of ST-segment depression in leads II, III, aVF and V5-6. The CK-MB level and troponin-I level were elevated. The initial chest X-ray showed mild cardiomegaly without pulmonary edema. The patient was referred for primary PCI.

At first, we tried to perform left coronary angiography, but we could not find the orifice of the left coronary artery (LCA). On aortography, the left anterior descending (LAD), left circumflex (LCx) and right coronary arteries (RCA) were seen to arise separately from the right coronary sinus and there was a diffuse stenotic lesion in the distal LCx coronary artery (Fig. 1A). A 6 French Amplatz right guiding catheter was engaged into the ostium of the LCx coronary artery. The lesion was crossed with a 0.014 hydrophilic coated floppy guidewire. After predilation, a sirolimus-eluting stent (3.0 mm × 33 mm) was implanted over the lesion at the distal LCx. The angiographic appearance was good with TIMI 3 flow (Fig. 1B). The 16-sliced multi-detector computed tomography showed the LAD, LCx and RCA coronary arteries branching off separately from the right coronary sinus (Fig. 2). The patient has remained asymptomatic and there was no evidence of instent restenosis on the 6-month follow-up coronary angiography.

Discussion

Failure to identify the anomalous origin of coronary arteries can lead to inadequate diagnosis and prolonged procedures, which can result in serious complications,
and especially during acute myocardial infarction.\(^5\) It is a huge mistake to assume that a vessel is occluded when, in fact, it has not been visualized due to an anomalous origin.\(^5\) When the origin of vessels has not been identified by initial angiography, the interventionalist has to consider the anomalous origin of a coronary artery and then try to identify the anomalous origin of such a vessel by immediate left ventriculography or aortography.\(^6\)

There are four subtypes of anomalous origin of the left main coronary artery from the right coronary sinus (Fig. 3A).\(^7\) The present case does not belong to any of these subtypes (Fig. 3B).

It has been reported that anomalous coronary arteries are prone to atherosclerosis.\(^8,9\) The coronary blood flow would be disturbed in anomalous coronary arteries originating from the opposite side coronary sinus, which is located between the pulmonary trunk and the ascending aorta.\(^6,10-12\) About half of the patients with anomalous LCA arising from the right coronary sinus die before the age of 20 years, and usually during or shortly after vigorous exertion.\(^13-15\) However, our patient did not have any cardiac symptoms until the age of 48 years, even though there was a significant atherosclerotic change in the LCx coronary artery. It appears that the cause...
of AMI in this patient might be related to coronary artery risk factors such as hypertension and smoking rather than to the anomalous coronary artery itself.

Angiographic recognition of unsuspected coronary anomalies is considered important for making an appropriate diagnosis and managing acute myocardial infarction. We report here on a case of successful primary percutaneous coronary intervention for acute myocardial infarction combined with an anomalous origin of the LAD and LCx coronary arteries that arose separately from the right coronary sinus. This coronary artery anomaly did not belong to any of the four classical subtypes of left main coronary artery arising from the right coronary sinus.

REFERENCES