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# 우관상정맥동에서 기시하는 단일 관상동맥 1예

# 정현광, 김태우, 조윤성, 김강민, 장재훈, 이재우<sup>+</sup>, 정준훈

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# A Case of Single Coronary Artery Originating from the Right Coronary Sinus

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#### ---- Abstract

Coronary artery anomalies are found incidentally in approximately 1% of all patients undergoing routine coronary angiography. Of these, an isolated single coronary artery anomaly is the rarest one. Patients with an isolated single coronary anomaly may present with symptoms such as angina pectoris, myocardial infarction, arrhythmias, syncope, sudden death, and congestive heart failure. We report a case of single coronary artery anomaly with the left anterior descending and left circumflex coronary artery originating from the right coronary artery.

Key words : Coronary vessel anomalies.

#### INTRODUCTION

Coronary artery anomalies are rare. Of these, an isolated single coronary artery anomaly is the rarest one.<sup>1, 2)</sup> Most coronary anomalies are usually asymptomatic, but single coronary artery anomalies are commonly associated with sudden cardiac death.<sup>3)</sup>

We present a case of single coronary artery anomaly with the left anterior descending artery (LAD) originating from the proximal right coronary artery (RCA) and the left circumflex coronary artery (LCx) originating from the postero-lateral branch of RCA.

## CASE REPORT

A 69-year-old woman presented with intermittent episodes of chest pain for 2 years. The pain was located at left side of the chest and not radiating to the left arm.

On medical history, she had hypertension, but there were not risk factors for coronary artery disease such as smoking, hypercholesterolemia, family history. On physical examination, her blood pressure was 170/90 mmHg with a heart rate of 80/min. Cardiac and lung auscultation were unremarkable. Electrocardiography revealed a normal sinus rhythm. Chest X-ray was normal. Transthoracic echocardiography demonstrated no cardiac abnormality. Her cardiac enzymes such as CK-MB, troponin-I were

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within normal limit.

For further evaluation, she subsequently underwent coronary angiography. Coronary angiography did not show any vessel originating from the left coronary sinus (CS). The RCA originated from the right CS. The LAD originated from the proximal RCA (Figure 1) and the LCx originated from the postero-lateral branch of RCA (Figure 2). The LAD had a anterior course, and gave rise to the proximal-mid and distal LAD (Figure 3). The left ventricular systolic function was normal.

Medical treatment with antihypertensive, vasodilating medication was recommended. Clinically follow-up at 1 year revealed adequate resolution of the angina presentation.



Figure 1. Antero-posterior caudal view (A) and spider view (B) of coronary angiography showed the LAD originating from the proximal RCA. LAD: left anterior descending coronary artery, RCA: right coronary artery.



Figure 2. LAO view of coronary angiography showed the LCx originating from the PL branch of RCA. LAO: left anterior oblique, LCx: left cricumflex artery, PL: postero-lateral, RCA: right coronary artery.



Figure 3. Antero-posterior cranial view (A) and RAO cranial view (B) of coronary angiography showed that the LAD had a anterior course, and gave rise to the proximal-mid and distal LAD. RAO: right anterior oblique, LAD: left anterior descending artery.

### DISCUSSION

Coronary artery anomalies are found incidentally during routine coronary angiography, with an incidence of approximately 1%.<sup>4, 5)</sup> Of these, an isolated single coronary anomaly is the rarest one. At the present time, coronary angiography is the procedure of choice to diagnostic coronary abnormalies and exclude atherosclerotic coronary disease.

Single coronary artery anomalies are described with respect to the point of origin of the left and right coronary arteries, the distribution over the ventricular surface and their relationship with ascending aorta and pulmonary artery. The Lipton classification scheme is the most practical for angiographers.<sup>2, 6)</sup> In this classification, according to the site of origin of single coronary artery in the right or the left sinus of Valsalva, the R or the L letter is first designated. It is then designated as group I, II, or III. In group I, they emerge separately, following the normal anatomical course of either a right or left coronary artery. In group II, they originate from the proximal part of the normally located coronary artery. In group III, the LAD and LCx arise separately from the proximal part of the normal RCA, without a common left main coronary artery. In addition, the last capital letter indicates the relationship of the anomalous coronary arteries with the great vessel whether they have a course anterior letter A, posterior

letter P, between the great vessel letter B, and combined letter C. Therefore, our case was classified as an R-II A coronary anomaly.

Although patients with coronary anomalies are usually asymptomatic, single coronary artery anomalies may cause symptoms such as angina pectoris, myocardial infarction, arrhythmias, syncope, sudden death, and congestive heart failure.<sup>7-9)</sup> The pathophysiology of sudden cardiac death may be due to compression of the proximal coronary artery by the pulmonary trunk or more likely by the aortic wall.<sup>10, 11)</sup> The dynamic compression during systole may also compromise the coronary blood flow. However, numerous other cases may explain the increased risk in patients with an anomalous origin of the coronary artery. This includes the size of the slit-like coronary ostium, the angle of the coronary ostium in relation to the aorta, and the length of intramural passage.<sup>3)</sup>

The management of patients with an anomalous origin of coronary artery, regardless of the presence of symptoms, may include surgical correction. This is particularly important in cases of anomalous origin of the left coronary artery from the aorta, which carries a high risk of sudden death.<sup>3)</sup> Coronary bypass graft surgery is the standard procedure of choice, with excellent long-term results.

In summary, an isolated single coronary artery anomaly is very rare and may present with sudden cardiac death. We report a case of a 69-year-old woman with chest pain who had the LAD originating from the proximal RCA and the LCx originating from the postero-lateral branch of RCA.

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