Case Report

Silent coronary spastic angina: A report of a case

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ABSTRACT

A 54-year-old man was admitted to our hospital due to abnormal electrocardiogram (ECG) changes. He had experienced no chest pain or chest discomfort during daily life until then. Ischemic ECG change was obtained by the treadmill exercise test but he complained of no chest pain or chest oppression. We performed coronary angiography and found near normal coronary artery with hypoplasia of right coronary artery. He complained of no chest symptoms irrespective of ischemic ECG change [ST depression in V3-6 leads (2.0–3.0 mm)], when intracoronary injection of 50 μg acetylcholine provoked subtotal spasm at mid left anterior descending artery and focal spasm at proximal left circumflex artery. After the administration of calcium-channel antagonist for four months, ischemic ECG changes were improved by the treadmill exercise test. He had experienced some slight fatigue during daily life and cold sweating during sleep three or four times a month before the medication. However, he had experienced less slight fatigue and no cold sweating during sleep after taking the calcium-channel antagonist. He experienced silent coronary spastic angina.

<Learning objective: We describe a case of coronary spastic angina without any chest symptoms through their life and discuss silent/painless coronary spastic angina.>

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Introduction

Coronary artery spasm may be involved in the pathogenesis of various cardiac disorders, such as acute coronary syndrome, sudden cardiac death, unstable angina, serious fatal arrhythmia, transient heart failure, and atypical chest symptoms [1–5]. Symptoms of not only rest angina but also effort angina include chest pain/oppression or chest discomfort. We finally performed spasm provocation tests in patients with rest and effort angina when suspecting the presence of coronary artery spasm. However, if the ischemic findings were accompanied without any chest symptoms by non-invasive examinations or during daily life, we may wonder whether we could diagnose angina pectoris in these patients or not. We experienced a case with coronary spasm without any chest symptoms during daily life and their life.

Case report

A 54-year-old man was admitted to our hospital due to abnormal electrocardiogram (ECG) changes (ST depression in inferior leads) for further examinations. He quit smoking 10 years previously and had neither hypertension nor diabetes mellitus. He had no chest pain or chest discomfort during daily life until now. We asked him about his chest symptoms in detail. However, he had no symptoms in jaw, throat, neck, back, shoulder, arm, or epigastric region. As shown in Fig. 1A, ischemic ECG change was obtained by the treadmill exercise test (1:30–1:50 pm) but he complained of no chest pain or chest oppression. Inferior ischemia was observed on thallium cardiac scintigram. We performed coronary angiography (CAG) and found near normal coronary artery with hypoplasia of the right coronary artery (RCA) (Fig. 2). He complained of neither chest symptoms nor cold sweating irrespective of ischemic ECG change (ST depression in V3-6 leads), when intracoronary injection of 50 μg acetylcholine provoked subtotal spasm at mid left anterior descending artery (LAD) and focal spasm at proximal left circumflex artery (LCX) (Fig. 3). About 10 years previously, he also had abnormal ECG changes and CAG was done. Multiple coronary artery spasm was also observed at
both proximal LAD and LCX portions. A calcium-channel antagonist was administered but he discontinued taking the medicine because of no chest symptoms 10 years previously. Because of positive coronary spasm without any chest symptoms during daily life, we recommend taking calcium-channel antagonists throughout his life. After the administration of calcium-channel antagonist for four months, we performed treadmill exercise test in the morning (9:30–9:50 am) under medication. Neither ischemic ECG changes nor chest symptoms were obtained by the treadmill exercise test when under medication (Fig. 1B). He had experienced some slight fatigue during daily life and cold sweating during sleep three or four times a month before the medication. However, he had experienced less slight fatigue and no cold sweating during sleep after taking the calcium-channel antagonist.

Discussion

In this article, we report a case with coronary spasm and without any chest pain/oppression or chest discomfort through their life. During daily life he had not felt or experienced any chest symptoms at all. However, typical coronary spasm was documented by pharmacological spasm provocation tests and ischemic ECG changes were obtained by non-invasive examinations that were accompanied without any chest pain/oppression/discomfort/dyspnea. The diagnosis in this case is silent myocardial ischemia due to coronary spasm which is classified as type I silent myocardial ischemia based on the Cohn's classification [6]. However, coronary spasm has multiple faces, such as typical chest pain/squeezing, atypical chest symptoms, and silent chest symptoms, as shown in Fig. 3. Considering the continuous spectrum of coronary spastic angina, active variant angina may be present at the highest disease activity, while painless/silent coronary spastic angina may be present at the opposite site. It may be better for us to make a new category of silent/painless coronary spastic angina on clinical grounds. We diagnosed this case as “painless/silent coronary spastic angina”, although he had no angina until now, because he had some slight fatigue during daily life and severe cold sweating during sleep before medication. His atypical chest symptoms such as some slight fatigue and cold sweating may be concerned symptoms due to coronary artery spasm irrespective of no appearance of chest pain or chest oppression. We recommend the new category of painless/silent coronary spastic angina as one of the types of coronary spastic angina.

Fig. 1. Treadmill exercise testing before and after 4 months of medication. (a) Before; (b) during maximal exercise; (c) 3 min after exercise test.

(a: before, b: during maximal exercise, c: 3 minutes after exercise test)

Fig. 2. Coronary angiography findings. (a and c) After ISDN in LCA; (b and d) after the intracoronary injection of 50 µg acetylcholine in LCA; (e) after ISDN in right coronary artery. ISDN, isosorbide dinitrate; LCA, left coronary artery.

Fig. 3. Schema of chest symptoms in coronary spastic angina.
According to our past data [7–9], coronary spasm was provoked in one of six patients with non-ischemic heart disease. We did not perform spasm provocation tests such as acetylcholine or ergonovine in patients with non-ischemic heart disease and unobstructed coronary artery disease when they did not complain of any chest discomfort. However, the appearance of chest pain/oppression during daily life is dependent on the threshold of chest pain/oppression in each patient. Only a third of ischemic ST-T segment changes during attacks in patients with variant angina had symptoms, while the remaining two-thirds of ST-T changes had silent ischemia as Yasue reported [10]. If patients have a high threshold of chest pain/oppression or are without any threshold of chest pain due to ischemia induced by coronary artery spasm, we may miss these patients regardless of typical coronary spastic angina. This patient had no diabetes mellitus and no abnormal neurological disease.

In this patient, the chief complaint was an abnormal ECG change. In patients with abnormal ECG changes, we may perform CAG after the non-invasive examinations. We should also reconsider to perform the spasm provocation tests if patients had no fixed stenosis. We may obtain new information in patients with abnormal ECG findings. And, we also should perform CAG and spasm provocation tests in patients with unknown syncope or unknown consciousness loss regardless of their not being accompanied by the presence of chest pain/oppression before syncope and consciousness loss. In addition, we also should perform spasm provocation tests in patients without fixed stenosis and with unknown cause of heart failure. If patients had positive provoked spasms, we should positively administer calcium-channel antagonists and nitrates before beta-blockers in these heart failure patients. Some patients with heart failure and positive provoked spasms have improved left ventricular function gradually after the administration of calcium-channel antagonists and nitrates. We named this state as vasospastic heart failure [5]. We had performed spasm provocation tests in patients with chest pain/oppression and chest discomfort until now. However, from now on, we may investigate as much as possible the presence of coronary artery spasm in all patients who had undergone CAG. In the real world we might diagnose only a small number of patients with coronary spasm who complained of typical or atypical chest symptoms. Silent and painless coronary spastic angina may have a potential to cause serious major cardiac events. We should medicate these silent/painless coronary spastic angina patients positively as well as those with symptomatic coronary spastic angina.

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**Conflict of interest**

The authors declare that they have no conflict of interest.

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**References**