Aspiration Thrombectomy for Acute Myocardial Infarction Resulting from the Sequential Occlusions of Two Major Coronary Arteries in a Short Time

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Abstract

A 49-year-old man was admitted to our hospital due to chest oppressive sensation. Coronary angiography showed total occlusion in the proximal right coronary artery even after intracoronary nitroglycerin, but no stenosis in the left coronary artery. He was treated with aspiration thrombectomy and stent deployment. After 23 hours, he suddenly had severe chest pain, and ECG showed marked ST elevation in leads I, aVL and V2–6. Surprisingly, coronary angiography showed total occlusion in the proximal left anterior descending artery even after intracoronary nitroglycerin where there had been no stenosis on first angiogram just 23 hours earlier. He was treated with aspiration thrombectomy.

Key words: myocardial infarction, thrombectomy, coronary spasm

Introduction

Plaque rupture and subsequent occlusive thrombus and bleeding in the plaque are considered to be a pathologic mechanism of acute myocardial infarction (AMI) (1). There have been several published reports describing AMI with the simultaneous occlusions of 2 major coronary arteries. Here, we describe a very rare case with AMI demonstrating the sequential occlusions of 2 major coronary arteries within a short time who was successfully treated with aspiration thrombectomy (2).
At 14:00 on the following day, he suddenly had severe chest pain, and ECG showed marked ST elevation in leads I, aVL, and V2–6 (Fig. 1). We performed emergency angiography via the right brachial approach. Surprisingly, coronary angiography showed total occlusion in the proximal left anterior descending artery even after intracoronary nitroglycerin where there had been no stenosis on the first angiogram just 23 hours earlier. Because we have known that there is no atherosclerotic lesion in the site, we performed only aspiration thrombectomy, and obtained TIMI 3 flow (Fig. 3). Because these sequential occlusions of 2 major coronary arteries might result from coronary spasm, carvedilol was discontinued. Amlodipine (5 mg/day) and nicorandil (15 mg/day) were added to the treatment, and he was discharged 7 days later.

**Discussion**

To the best of our knowledge, this is the first report angiographically demonstrating the *sequential* occlusions of 2 major coronary arteries within a short time.

Even AMI resulting from the *simultaneous* occlusions of 2 major coronary arteries is very rare. Only a few such case reports have been recently published. Yoshitomi et al (3) reported a 34-year-old man with AMI due to the simultaneous occlusions of the left anterior descending artery and left circumflex artery. He was successfully treated with primary angioplasty for the left anterior descending artery and with thrombolytic therapy for the left circumflex artery. Because intracoronary ergonovine induced diffuse vasospasm in both arteries 4 weeks later, they thought that coronary spasm might be the causative factor for AMI in their case. Shen et al (4) reported a 54-year-old man with AMI due to the simultaneous occlusions of 2 remote major coronary arteries: the right coronary artery and the left anterior descending artery. ECG showed ST elevation in both inferior and precordial leads. They did not show the causative mechanism of the simultaneous occlusions of the 2 major coronary arteries. Hakim and Mehta (5) also reported a similar case, and called this condition ‘the deadly double infarct syndrome’.

Previous studies demonstrated that preexisting stenosis of the infarct-related coronary segment was mostly mild, and its morphology was smooth vessel wall on coronary angiograms that were mostly performed 1 year or even 3 months before the onset of AMI (6, 7). There was only one published study focusing on coronary angiogram immediately before the onset of AMI. Ojio et al (8) reported that the features of the infarct-related coronary segment at 3 days before AMI indicated the presence of a significant stenosis of >50% and Ambrose’s type II eccentric lesions. From these results, they thought that there was a considerable time from the onset of plate rupture and/or thrombi until the onset of AMI. In the present case, there was no stenosis in the left anterior descending artery 23 hours before the onset of anterior AMI.
suggesting quite a different mechanism from plaque rupture.

There are several possible mechanisms of the sequential or simultaneous occlusions of 2 major coronary arteries; coronary spasm, coronary embolism of intracardiac thrombus, propensity to thrombosis or coronary flow reduction due to hypotension. In our case, ECG showed sinus rhythm, and transthoracic echocardiography showed no intracardiac thrombus. In addition, he had no history of other vascular embolism or propensity to thrombosis. Moreover, as the most important finding of this case, we demonstrated that there was no stenosis in the proximal left anterior descending artery on the first angiogram 23 hours before the onset of anterior AMI. Direct evidence has been reported for coronary spasm resulting in AMI with thrombus formation (9). From these findings, in our case, we thought that coronary spasm might be the most possible mechanism especially at the time of anterior AMI, although we did not perform a coronary spasm provocation test.

Some of the cases reported as simultaneous occlusions of 2 major coronary arteries until now might have resulted from
sequential occlusions within a short time as shown in the current report.

References


2) Wang HJ, Kao HL, Liau CS, Lee YT. Export aspiration catheter thrombosuction before actual angioplasty in primary coronary inter-


