

CASE REPORT

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Acute Coronary Syndrome With Normal Coronary Arteries: a Case of Spontaneous Spasm Lysis

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ABSTRACT

Introduction: Patients suffering from Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA) are found with no obstructive coronary artery disease on coronary arteriography. The Aim of this interesting case report is to present a patient with acute chest pain, temporal ST-segment elevation and MINOCA. **Case report:** A case of a young woman who presented with acute chest pain suggestive of angina, with temporal ST-segment elevation, accidentally recorded and not rising of myocardial necrosis biomarkers in blood tests is described. A coronary angiography via right radial artery was performed and revealed normal coronary arteries. She was defined suffering from Myocardial infarction with Non-Obstructive Coronary Arteries (MINOCA) which occurs in 1–14% of Myocardial Infarction cases. Treatment with nitrates calcium, calcium channel blockers and antiplatelet in the basis of ACS is highly indicated. **Conclusion:** Coronary artery spasm is not a rare cause of ACS. Coronary angiography is indicated in all cases to exclude severe coronary heart disease

Keywords: MINOCA, coronary artery spasm, acute coronary syndrome, unstable angina.

1. INTRODUCTION

Approximately 6% of patients with myocardial infarction, who underwent coronary angiography, were found with no obstructive coronary artery disease, which was defined as below 50% stenosis in main epicardial coronary arteries. These patients were classified as suffering from Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA) (1, 2).

We describe a case of a young woman who presented with acute chest pain suggestive of angina, no persistent ST-segment elevation accidentally recorded and not rising of myocardial necrosis biomarkers in blood tests. Although the main etiologic factor in patients with unstable angina is obstructive coronary artery disease, coronary artery spasm is an important pathophysiology mechanism in the appearance of acute coronary syndromes.

2. CASE DESCRIPTION

Forty-six years-old postmenopausal woman with a past medical history of arterial hypertension and smoking, presented to emergency room complaining for chest pain episodes lasting from 10 to 20 minutes, started 6 hours ago. An ECG

was performed during chest pain episode and a ST-segment elevation in precordial leads V1-V5 was recorded which spontaneously resolute, accompanied by pain relief (Figure 1). She was admitted for monitoring and treated with a combination of anti-platelet agents (ASA plus clopidogrel), metoprolol, intravenous nitroglycerin, atorvastatin and anti-coagulation with low molecular weight heparin- enoxaparin. No elevation of high sensitivity troponin T was detected and all her rest laboratory exams were also completely normal. Next day ECG developed negative T waves in the same precordial leads (Figure 2). Patient had a GRACE risk score 126 and she was led to laboratory for coronary intervention. A coronary angiography via right radial artery was performed and revealed normal coronary arteries (Figure 3). Left ventriculography was also performed and apical ballooning syndrome (Takotsubo syndrome) was ruled-out. Myocarditis was easily excluded because of her referred symptoms and the negative troponin. After coronary angiography her treatment changed and she was treated with anti-platelet agents (ASA plus clopidogrel), Isosorbide-5-Mononitrate, verapamil and atorvastatin. Patient

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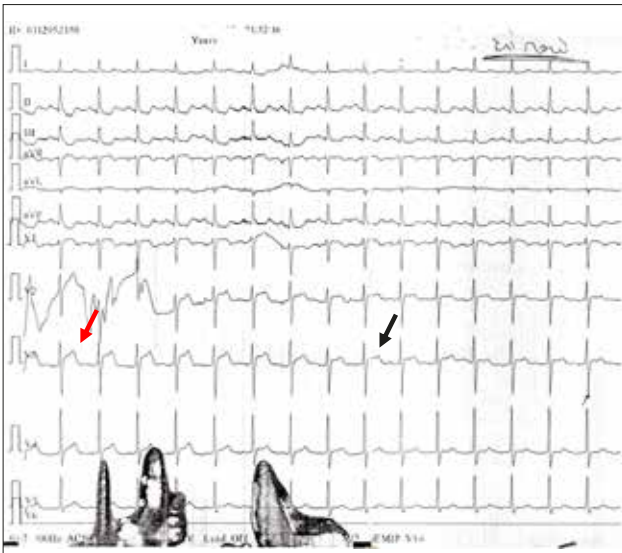


Figure 1. ECG performed during chest pain episode showing a ST-segment elevation in precordial leads V1-V5 (Red arrow) which was spontaneously resolved (Black arrow), accompanied by pain relief.

was discharged on the 5th day post-admission. During her hospitalization she remained free of symptoms and there were no recurrent ischemic events or other complications.

3. DISCUSSION

Myocardial infarction with non-obstructive coronary arteries (MINOCA) occurs in 1–14% of Myocardial Infarction cases. According to Agewall et al. (3) patients presenting with symptoms suggestive of ischemia, fulfill the universal criteria of Acute Myocardial Infarction (AMI) and they do not have obstructive (>50% stenosis) coronary artery disease can be classified as patients suffering from MINOCA. The differential diagnosis for MINOCA includes myocarditis, coronary microvascular disease, pulmonary embolism, myocardial diseases such as Takotsubo and imbalance between oxygen supply and demand of myocardium (Type 2 myocardial infarction).

Coronary artery spasm is the most common cause of ACS in patients with non-obstructive lesions in coronary angiography and should be considered even in patients with less coronary risk factors and non-obstructive coronary arteries (2, 3). Vasospasm may exist with normal coronary arteries or in combination with atherosclerotic lesions (4).



Figure 2. Next day ECG developed negative T waves in precordial leads V1-V5.

Prolonged coronary spasm can cause temporary occlusion of the coronary artery and consequently myocardial ischemia (3). On the other hand coronary spasm can also trigger acute thrombus formation via platelet activation and cause coronary atherosclerosis progression (5, 6).

Transthoracic echocardiography and Computed Magnetic Resonance Tomography (CMR) can help the differential diagnosis in patients with MINOCA and suspected myocarditis, while endomyocardial biopsy remains the gold standard to establish the diagnosis of myocarditis. CMR also can be used in the diagnosis of small myocardial infarctions and of the Takotsubo cardiomyopathy.

Provocative test with acetylcholine or ergonovine during coronary angiography, and newer imaging methods such as Optical Coherence Tomography (OCT) and Intravascular Ultrasound (IVUS) can help understanding the underlying pathology in coronary spasm and ACS appearance (2, 7). As soon as calcium channel blockers and nitrates are strongly recommended as first line drugs in coronary artery spasm (8). beta-blockers should be avoided as they prosper spasm by leaving alpha-mediated vasoconstriction unopposed by beta-mediated vasodilation (9).

4. CONCLUSION

Coronary artery spasm is not a rare cause of ACS. Coronary angiography is indicated in all cases to exclude severe coronary heart disease and treatment with nitrates

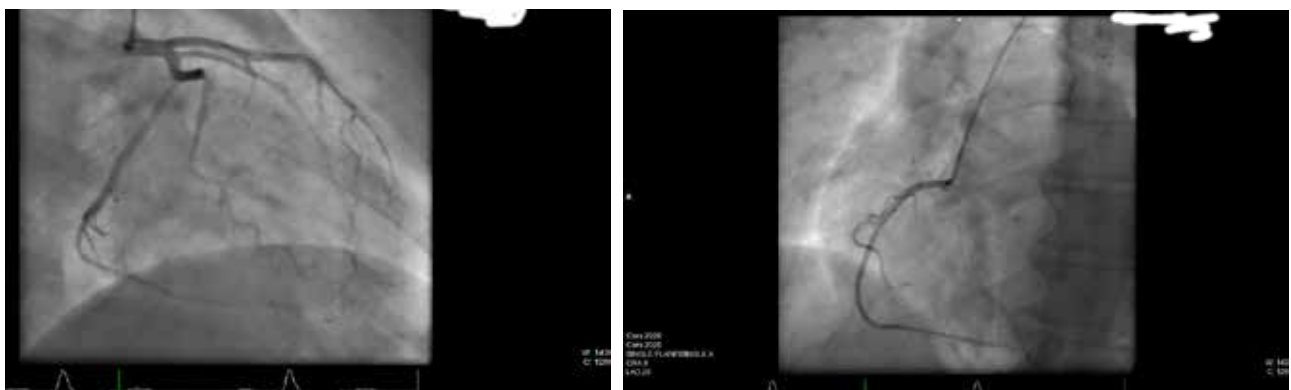


Figure 3. Coronary angiography showing normal coronary arteries. A: Left Coronary Artery (LCA), B: Right Coronary Artery (RCA).

calcium, calcium channel blockers and antiplatelet in the basis of ACS is highly indicated.

- Author contribution: Vogiatzis Ioannis: Design, drafting article, critical revision of the article, approval of the article. Koutsambasopoulos Konstantinos: Concept, data analysis, interpretation, critical revision of the article, approval of the article. Samaras Antonios: Intervention, critical revision of the article, approval of the article. Bostanitis Ioannis: Intervention, critical revision of the article, approval of the article.
- Conflict of interest: nothing to declare.

REFERENCES

1. Pasupathy S, Air T, Dreyer RP, Tavella R, Beltrame JF. Systematic review of patients presenting with suspected myocardial infarction and nonobstructive coronary arteries. *Circulation*. 2015; 13: 861-70.
2. Ibáñez B, James S, Agewall S, Antunes MJ, Bucciarelli-Ducci C, Bueno H, et al. 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. *Rev Esp Cardiol (Engl Ed)*. 2017; 70: 1082-95.
3. Agewall S, Beltrame JF, Reynolds HR, Niessner A, Rosano G, Caforio AL, et al on behalf of the WG on Cardiovascular Pharmacotherapy. ESC working group position paper on myocardial infarction with non-obstructive coronary arteries. *Eur Heart J*. 2017; 38: 143-53.
4. Ong P, Athanasiadis A, Hill S, Vogelsberg H, Voehringer M, Sechtem U. Coronary artery spasm as a frequent cause of acute coronary syndrome: the CASPAR (coronary artery spasm in patients with acute coronary syndrome) study. *J Am Coll Cardiol*. 2008; 52: 523-7.
5. Nakayama N, Kaikita K, Fukunaga T, Matsuzawa Y, Sato K, Horio E, et al. Clinical features and prognosis of patients with coronary spasm-induced non-ST-segment elevation acute coronary syndrome. *J Am Heart Assoc*. 2014; 3: e000795. doi: 10.1161/JAHA.114.000795.
6. Morimoto S, Shiga Y, Hiramitsu S, Yamada K, Nomura S, Miyagi Y, et al. Plaque rupture possibly induced by coronary spasm—an autopsy case of acute myocardial infarction. *Jpn Circ J*. 1988; 52: 1286-92.
7. Kaikita K, Ogawa H, Yasue H, Sakamoto T, Suefuji H, Sumida H, et al. Soluble P-selectin is released into the coronary circulation after coronary spasm. *Circulation*. 1995; 92: 1726-30.
8. Tanaka A, Shimada K, Tearney GJ, Kitabata H, Taguchi H, Fukuda S, et al. Conformational change in coronary artery structure assessed by optical coherence tomography in patients with vasospastic angina. *J Am Coll Cardiol* 2011; 58: 1608-13.
9. Hung MJ, Hu P, Hung MY. Coronary artery spasm: review and update. *Int J Med Sci*. 2014; 11: 1161-7.