International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(CASE REPORT)

The hidden culprit: Coronary Spasm Mimicking NSTEMI: A Case Study

Hicham Faliouni [1,*], Youssef Fihri [1], Nabil Laktib [1], Soumia Faid [1], Driss Britel [1], Aatif Benyass [2] and Zouhair Lakhal [1]

[1] *Cardiac Catheterization Unit, Cardiology Center, Mohamed V Military Training Hospital, Rabat, Morocco.*
[2] *Cardiology Center, Mohamed V Military Training Hospital, Rabat, Morocco.*

International Journal of Science and Research Archive, 2025, 15(01), 143-146

Publication history: Received on 16 February 2025; revised on 29 March 2025; accepted on 31 March 2025

Article DOI: https://doi.org/10.30574/ijsra.2025.15.1.0172

Abstract

Coronary artery spasm is a rare but significant cause of myocardial ischemia, often presenting as non-ST-elevation myocardial infarction (NSTEMI). We report the case of a 61-year-old male with cardiovascular risk factors including recently diagnosed hypertension and active smoking, who presented with acute chest pain. Coronary angiography revealed plaques with less than 50% stenosis and a spastic lesion in the right coronary artery (RCA). The patient responded well to medical therapy and demonstrated stable hemodynamics during follow-up. This case underscores the importance of recognizing coronary artery spasm in NSTEMI and highlights the role of clinical, imaging, and angiographic findings in its diagnosis and management.

Keywords: NSTEMI; Coronary spasm; Non-Obstructive Coronary Artery Disease; Vasospastic angina; Calcium channel blockers

1. Introduction

Coronary artery spasm is a dynamic narrowing of the coronary arteries, often associated with ischemic events such as myocardial infarction in the absence of significant atherosclerotic lesions [1]. Although more commonly associated with variant angina, coronary spasm can present as NSTEMI, challenging clinicians to make timely and accurate diagnoses [2]. Herein, we describe a case of NSTEMI in a 61-year-old male, ultimately attributed to coronary spasm.

2. Case Presentation

A 61-year-old male, married and father of two, presented with acute chest pain. His cardiovascular risk factors included recently diagnosed hypertension (poorly controlled, on amlodipine 5 mg) and chronic active smoking (30 pack-years). Five days prior, he had been evaluated for hypertensive urgency without associated chest pain or syncope. On admission, the patient was hemodynamically stable (BP 190/66 mmHg, HR 82 bpm) and exhibited biphasic T waves in V3 and negative T waves in apical-lateral leads on ECG [Figure 1].

* Corresponding author: Hicham Faliouni.

Copyright © 2025 Author(s) retain the copyright of this article. This article is published under the terms of the Creative Commons Attribution Liscense 4.0.

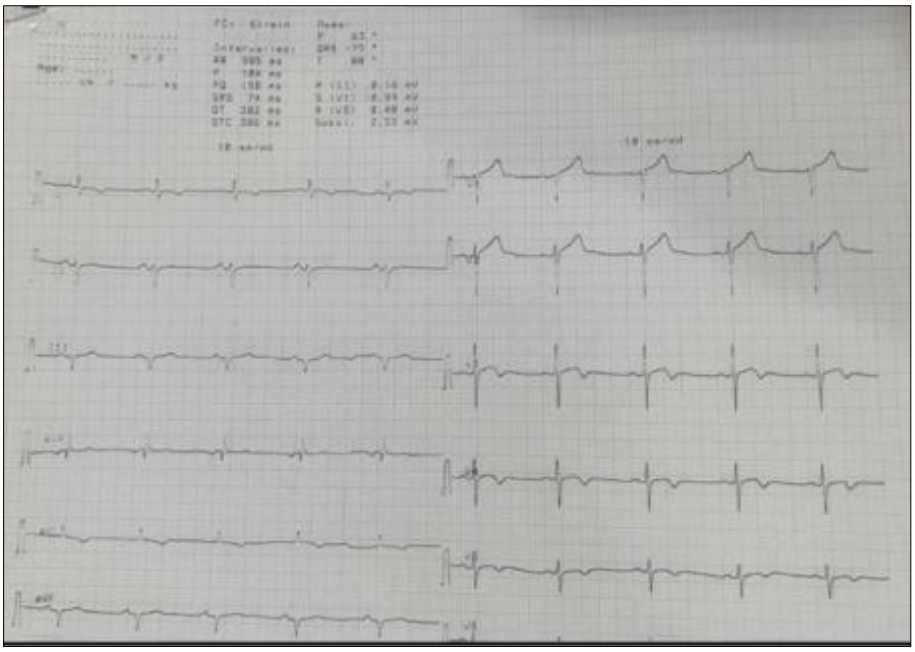

Figure 1 Biphasic T waves in lead V3 and negative T waves in the apical-lateral leads on the ECG

Laboratory tests indicated declining troponin levels. Echocardiography revealed a preserved left ventricular ejection fraction (60%), normal-sized ventricles, no regional wall motion abnormalities, and no pericardial effusion. Imaging revealed plaques with <50% stenosis in the proximal and mid-LAD and a spastic lesion in the RCA, confirmed via coronary angiography [Figure 2,3].

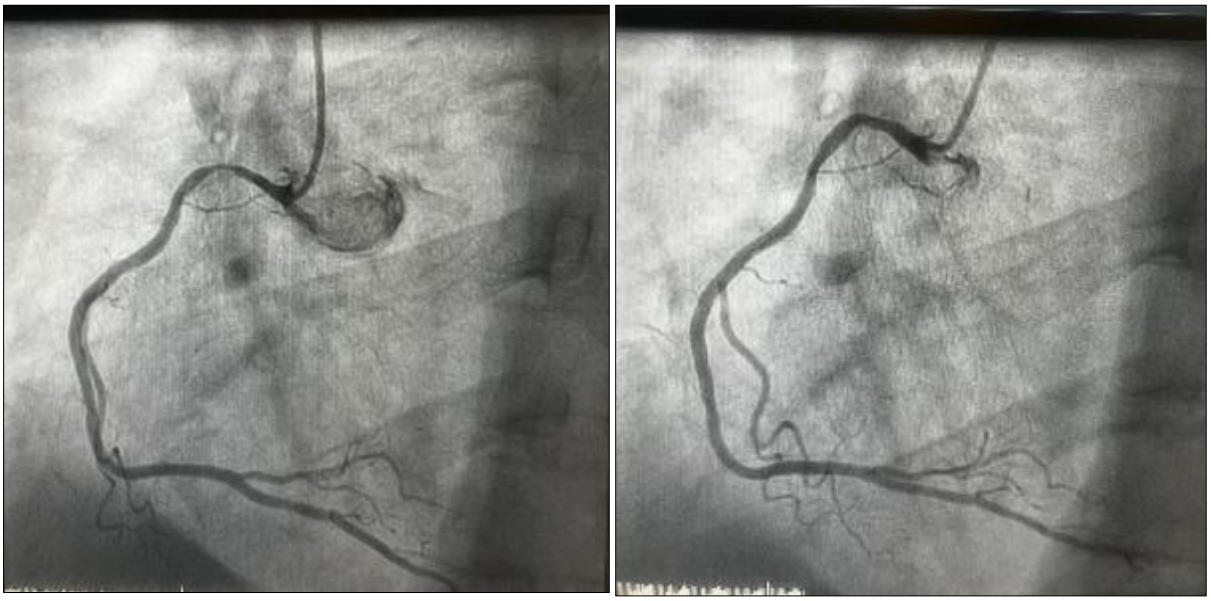

Figure 2 and 3 Coronary angiography revealed a spastic lesion in the proximal right coronary artery, which resolved after the administration of a calcium channel inhibitor

The patient was managed conservatively with antiplatelet therapy (aspirin 75 mg), calcium channel blockers (amlodipine), and smoking cessation support. During follow-up, he remained asymptomatic with stable hemodynamics (BP 150/70 mmHg) and no recurrence of ischemic events.

3. Discussion

Coronary artery spasm is a dynamic mechanism of myocardial ischemia, classified under Type 2 myocardial infarction [1]. It can occur in patients with or without coronary artery atherosclerosis and may involve epicardial or microvascular vessels. Proposed mechanisms include vascular smooth muscle hyperreactivity, endothelial dysfunction, magnesium deficiency, autonomic nervous system dysregulation, and low-grade inflammation [3,4]. Diagnosis often requires provocation testing, such as with acetylcholine, to demonstrate reversible coronary vasoconstriction [5].

First-line therapy involves calcium channel blockers to reduce intracellular calcium levels and prevent smooth muscle contraction. Adjunctive treatment includes nitrates and magnesium supplementation [6]. Smoking cessation is critical, as nicotine is a potent vasoconstrictor and exacerbates coronary spasm [7].

In this case, the spastic lesion observed in the RCA underscores the dynamic nature of coronary spasm and its ability to mimic obstructive coronary disease. The patient's response to calcium channel blockers and lifestyle modifications highlights the efficacy of tailored management strategies. Similar cases emphasize the need for clinicians to maintain a high index of suspicion for coronary spasm, particularly in younger patients or those without significant atherosclerosis [8].

Further research is warranted to better understand the pathophysiology, optimize diagnostic algorithms, and refine treatment protocols for patients with coronary spasm [9].

4. Conclusion

Coronary artery spasm is a significant but often underdiagnosed cause of myocardial ischemia, particularly in the context of NSTEMI with non-obstructive coronary findings. This case highlights the importance of recognizing coronary spasm as a potential etiology, even in patients with minimal atherosclerotic burden. Prompt diagnosis through clinical assessment, imaging, and angiographic findings is essential for initiating effective therapy.

Management strategies should focus on calcium channel blockers and nitrates to mitigate vasospasm, along with aggressive risk factor modification, particularly smoking cessation. Long-term follow-up and patient education are critical to ensure adherence to therapy and to monitor for recurrence. By increasing awareness and understanding of coronary spasm, clinicians can improve patient outcomes and reduce the risk of future ischemic events.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Picard F, Sayah N, Spagnoli V, et al. Vasospastic angina: a literature review of current evidence. Arch Cardiovasc Dis. 2019;112:44–55.

[2] Tamis-Holland JE, Jneid H, Reynolds HR, et al. Contemporary diagnosis and management of patients with myocardial infarction in the absence of obstructive coronary artery disease: a scientific statement from the American Heart Association. Circulation. 2019;139:e891–e908.

[3] Minshall RD, Miyagawa K, Chadwick CC, et al. In vitro modulation of primate coronary vascular muscle cell reactivity by ovarian steroid hormones. FASEB J. 1998;12:1419–1429.

[4] Kawano H, Motoyama T, Ohgushi M, et al. Menstrual cyclic variation of myocardial ischemia in premenopausal women with variant angina. Ann Intern Med. 2001;135:977–981.

[5] Teragawa H, Kato M, Yamagata T, et al. The preventive effect of magnesium on coronary spasm in patients with vasospastic angina. Chest. 2000;118:1690–1695.

[6] Ya'qoub L, Elgendy IY, Pepine CJ. Syndrome of nonobstructive coronary artery diseases: a comprehensive overview of open artery ischemia. Am J Med. 2021;134:1321–1329.

[7] Mishra RG, Stanczyk FZ, Burry KA, et al. Metabolite ligands of estrogen receptor-beta reduce primate coronary hyperreactivity. Am J Physiol Heart Circ Physiol. 2006;290:H295–H303.

[8] Tweet MS, Codsi E, Best PJM, et al. Menstrual chest pain in women with history of spontaneous coronary artery dissection. J Am Coll Cardiol. 2017 ; 70:2308–2309.

[9] Hung MY, Mao CT, Hung MJ, et al. Coronary artery spasm as related to anxiety and depression: a nationwide population-based study. Psychosom Med. 2019 ; 81:237–245.