

Case Report

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A Working Diagnosis of Recurrent Chest Pain



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Keywords: Hyperlipidemia; Diaphoresis and Nausea; Coronary angiography; Coronary artery; Malignancy or Pro-coagulant state

Abbreviations: SCAD: Spontaneous Coronary Artery Dissection; MINOCA: Myocardial Infarction with Non-Obstructive Coronary Artery Disease

Case Study

A man in his 40s with a history of hyperlipidemia and smoking presented with chest pain. He was recently hospitalized with sudden-onset chest pain associated with diaphoresis and nausea. No palpitations or lightheadedness. He was given sublingual nitroglycerin and aspirin and the pain resolved. ECG showed sinus rhythm with no ST or T wave changes. Troponin rose from 9 ng/L to 32 ng/L at two hours (normal <15 ng/L). A transthoracic echocardiogram revealed normal biventricular systolic function, no regional wall motion abnormalities, and no valvular heart disease. CT coronary angiography showed mild (maximum 20%) atheroma in the right coronary but no acute plaque rupture. He had no allergies.

He had 3 further episodes of chest pain over the next 6 months which settled spontaneously or with nitroglycerin. He was sent for invasive coronary angiography (Figure 1A - baseline images, Figure 1B - after acetylcholine administration). What is the most likely diagnosis?

- a) Coronary artery spasm.
- b) Coronary embolism.
- c) Microvascular coronary disease.
- d) Spontaneous Coronary Artery Dissection (SCAD).
- e) Pulmonary embolism.

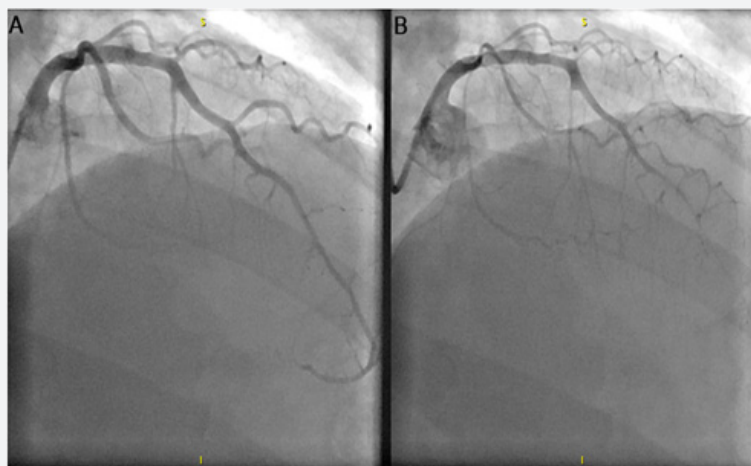


Figure 1: Invasive coronary angiogram showing the LAD at baseline (A) and with acetylcholine (B).

Correct answer: A

The patient presented with MINOCA (myocardial infarction with non-obstructive coronary artery disease). Common causes include coronary spasm, non-obstructive coronary plaque rupture and SCAD [1]. Coronary artery spasm is defined as intense vasoconstriction (>90%) of an epicardial coronary artery causing myocardial ischemia. It is more common in males and smokers. Coronary spasm can be diagnosed via transient ST changes which resolve with nitrates in the absence of significant coronary artery disease. It may be directly demonstrated during coronary angiography, either spontaneously or in response to provocation agents such as acetylcholine (Figure 1B). The figure shows near-obliteration of the distal LAD with acetylcholine. In contrast, patients with normal coronary arteries get vasodilation with acetylcholine [2].

In SCAD the angiogram at baseline would look abnormal with a tear/lucency or fat-thin-fat (intra-mural hematoma) appearance in the coronary artery [3]. Chest pain due to SCAD, coronary embolism or pulmonary embolism would usually not resolve with nitrates. Patients with coronary or pulmonary embolism often have risk factors for thromboembolic disease e.g., malignancy or pro-coagulant state. Microvascular disease would not cause the appearances in Figure 1B, although it may co-exist with coronary spasm.

Educational Objective: MINOCA comprises 5-6% of acute MI. Coronary spasm is a major underlying pathological mechanism, which is often diagnosed with provocative spasm testing during coronary angiography.

Conflict of Interest: None declared.

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