

## Young women with acute myocardial infarction. Where to look for the causes?

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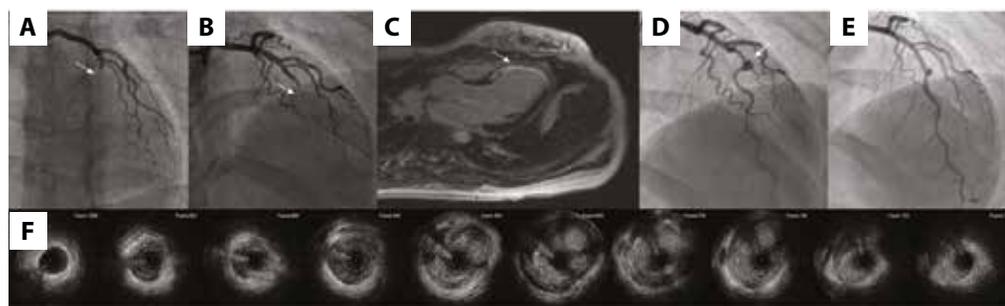
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In recent decades, the incidence of myocardial infarction (MI) has significantly declined in the general population [1]. However, MI rates in young people, especially women, have not decreased as much as among older adults. On the contrary, based on some studies, the incidence of MI in young people has increased over the past few years [2]. The underlying reason is probably an underestimation of cardiovascular risk and the resulting lack of treatment for young people [3]. Nevertheless, as the current case shows, an acute MI can also occur in young people without typical cardiovascular risk factors. Moreover, in the current pandemic, a COVID-19 infection should be additionally considered as a possible risk factor for an acute MI.

A 27-year-old woman with neither cardiovascular risk factors nor a history of coronary artery disease (CAD) was admitted to the local hospital with an ST-segment elevation myocardial infarction (STEMI) of an anterior wall. Importantly, RT-PCR (real-time polymerase chain reaction) tests for COVID-19 were negative, and she did not present any symptoms

of SARS-CoV-2 infection earlier. Coronary angiography revealed a total occlusion of the left descending artery (LAD) in the middle segment (Figure 1A), requiring in an immediate primary percutaneous coronary intervention. Despite numerous attempts, it was not feasible to pass the guidewire distally through the lesion and restore the arterial flow. The patient was treated with heparin and a glycoprotein (GP) IIb/IIIa inhibitor in a bolus, followed by an intravenous infusion, and was transferred to the intensive cardiology care unit. A control coronary angiography performed two days later showed persistent LAD occlusion (Figure 1B). The second percutaneous coronary intervention attempt was also unsuccessful.

Within a few months, the patient was admitted to our hospital for another attempt of the LAD recanalization. On admission, she presented the Canadian Cardiovascular Society class III symptoms. Cardiac magnetic resonance confirmed post-infarction transmural scar of the interventricular septum and apex area with segmental impairments in contractility and preserved global ejection fraction



**Figure 1.** A. Anteroposterior cranial view of LCA. Acute occlusion of LAD artery (arrow). B. RAO view of LAD after 2 days with persistent LAD occlusion (arrow). C. Cardiovascular magnetic resonance, 4-chamber view. Late gadolinium enhancement of the interventricular septum and apex area (arrow). D. RAO view of LAD after 4 months with patent severe stenosed LAD and aneurysm in the middle segment (arrow). E. IVUS imaging of middle segment of LAD. F. RAO view of LAD after percutaneous coronary intervention with stent implantation in the middle segment. Abbreviations: IVUS, intravascular ultrasound; LAD, left anterior descending; LCA, left coronary artery; RAO, right anterior oblique

(59%) (Figure 1C). Coronary angiography demonstrated recanalized LAD with severe stenosis and a saccular aneurysm distal to the target lesion (Figure 1D). The size of the aneurysm was evaluated as 7.8 mm × 8.7 mm on quantitative coronary angiography. In the arterial segments, both proximally and distally to the lesion, intravascular ultrasound (IVUS) showed a normal vessel wall free of atherosclerotic lesions (Figure 1E). Furthermore, an intima dissection was confirmed, significantly narrowing the vessel lumen. Only after pre-dilatation of the lesion with a noncompliant (NC) balloon, was the drug-eluting stent (XIENCE PRO 2.5 × 23 mm, Abbott Vascular, Chicago, IL, US) successfully implanted across the diagonal branch. The procedure was finalized with Proximal Optimisation Technique using a 3.0 mm NC balloon (Figure 1F). IVUS confirmed optimal stent apposition as well as residual flow in the saccular aneurysm.

In conclusion, the most probable cause of our patient's condition is a coronary aneurysm, as it poses a risk of MI, arrhythmias, or even sudden cardiac death. The causative factors behind coronary aneurysms include atherosclerosis, inflammatory diseases, congenital or iatrogenic arteries defects, connective tissue disorders, or drug-induced side effects [4].

## Article information

**Conflict of interest:** None declared.

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