



## **Unexpected severe coronary artery disease in a young patient with only one modifiable risk factor**

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## **Unexpected severe coronary artery disease in a young patient with only one modifiable risk factor**

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**Short title:** Coronary artery disease in a young man

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A 34-year-old man was referred to a catheterization laboratory for urgent diagnosis and treatment of ST-elevated myocardial infarction (STEMI) of the anterior wall. The symptoms began two days before the admission and were typical for myocardial ischemia. The vital signs were in the normal range. A family history of premature heart disease was negative and the patient had no chronic diseases. The only reported cardiovascular (CV) risk factor was heavy smoking. Coronary angiography was performed to exhibit an occlusion in the left ascending artery (LAD). Immediate percutaneous coronary intervention was done with a drug-eluting stent deployment (**Figure 1**). Transthoracic echocardiography revealed a decreased left ventricular ejection fraction of 45%–48%, driven by regional contractility abnormalities of the anterior wall and interventricular septum. Further hospitalization in the

intensive cardiac care unit was uneventful. Surprisingly, the lipid profile did not appear abnormal (Supplementary material, *Table S1*). During the hospital stay, the patient was rehabilitated and mobilized without any signs or symptoms of cardiac ischaemia. He was discharged home after 5 days on 1 × 75 mg aspirin, 2 × 90 mg ticagrelor, 1 × 1.25 mg bisoprolol, 1 × 5 mg perindopril, 1 × 20 mg rosuvastatin and 1 × 20 mg pantoprazole. He was referred to a further cardiac rehabilitation program.

Based on the guidelines of the European Society of Cardiology (ESC) for the management of STEMI, an immediate coronary invasive diagnosis and treatment was performed in the presented case [1]. Although the patient was young, physically active, without elevated blood pressure, with a normal lipidogram and without a family history of premature ischemic heart disease, severe atherosclerosis of LAD was confirmed.

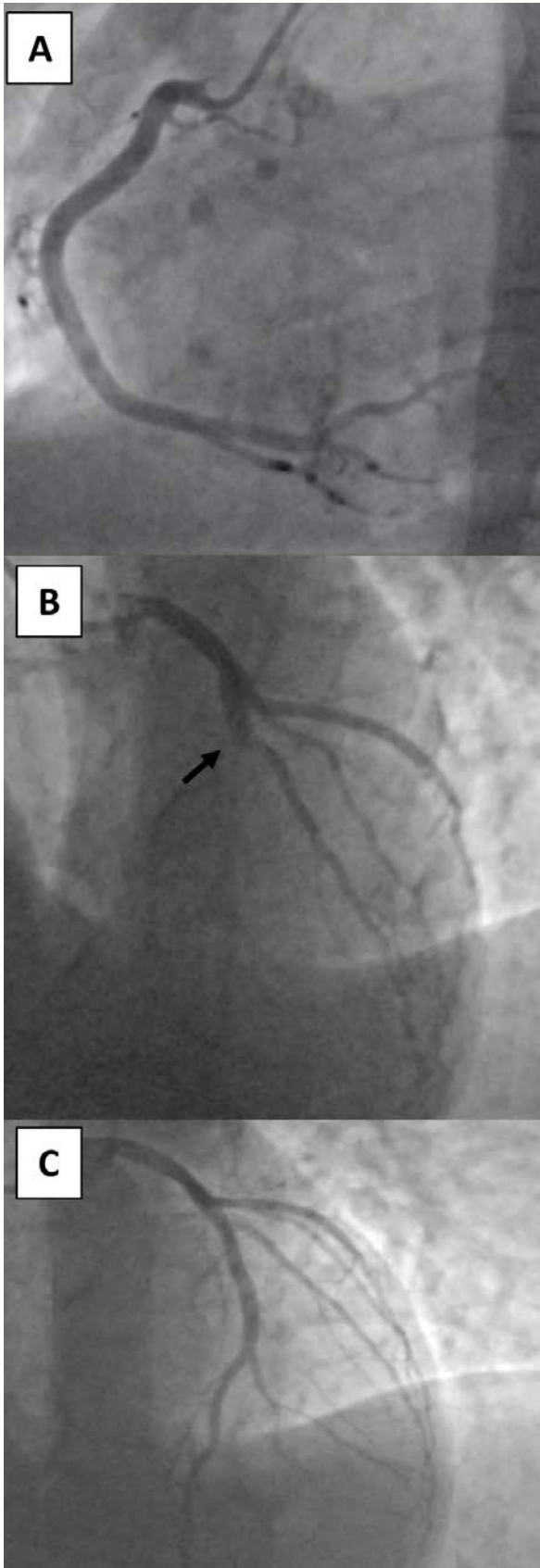
In 2021, new ESC guidelines on CV prevention were released. Those recommend using the updated SCORE algorithm — SCORE2/SCORE2-OP to estimate an individual's 10-year risk of fatal and non-fatal CV events (myocardial infarction, stroke) in apparently healthy people aged 40–89 years with risk factors that are untreated or have been stable for several years [2]. Although our patient's estimated CV risk might have been low, this case report suggests that more attention should be paid to younger patients. The introduction of dedicated scales to assess CV risk in such patients might be justified.

There are few differences in epidemiology of CV risk factors between younger and older patients with coronary artery disease. Dyslipidemia is more common among patients <45 years with coronary artery disease than among older counterparts. It was also found that the younger population had a less extensive coronary disease and a better prognosis [3]. Nonetheless, despite a recent decline in tobacco use, smoking remains the strongest modifiable risk factor of ischaemic heart disease in young individuals. Quitting smoking reduces CV risk and is essential in cardiological assessment and treatment. According to the Centers for Disease Control and Prevention most smokers want to cease smoking. However, without professional medical support only 4% of cigarette users succeed in quitting [4]. Non-pharmacological methods (e.g. “very brief advice”, mood-management therapies in patients with current or past depression) and pharmacological methods (nicotine-replacement therapy, bupropion, varenicline, and cytisine) can be used to increase the chance of quitting [2, 4]. In all patients after percutaneous coronary intervention, it is important to conduct appropriate education [5].

Certainly, in addition, a family history of premature CV disease and suspected familial hypercholesterolemia should also receive close attention [2].

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**Figure 1.** **A.** The baseline angiography of the right coronary artery. **B.** The baseline angiography of the left coronary artery with an occlusion in the mid left descending coronary artery (LAD, arrow). Diffuse, non-significant disease of remaining vessels. **C.** The final result of percutaneous coronary intervention within LAD