A TWENTY-YEAR-OLD MAN WITH ACUTE MYOCARDIAL INFARCTION

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Introduction
Premature coronary artery disease (CAD) refers to coronary atherothrombotic lesions, or atherosclerotic narrowing of the coronary arteries in men younger than 55 years and in women younger than 65 years of age.

Case Presentation
A 20-year-old man with diet-controlled type-2 diabetes mellitus (MODY) presented with acute mid-sternal chest pain provoked 1-hour after running, associated with diaphoresis and nausea. He had intermittent exertional chest pain 3-weeks prior to this presentation. Five months prior, he recovered from mild COVID-19 disease. His father had acute myocardial infarction at age 40, and his mother had systemic lupus erythematosus. He was not on any medication and denied use of tobacco, alcohol or recreational drugs.

His vitals recorded blood pressure of 153/90 mmHg, pulse 85 beats/min, and respiratory rate of 26/min. His body-mass-index was 31.17 kg/m². The rest of his physical exam and vitals were unremarkable. His electrocardiogram showed normal-sinus-rhythm with ST-segment elevations in anteroseptal leads. His delta high-sensitivity cardiac troponin-T was elevated. A comprehensive metabolic panel, complete blood count, and chest x-ray were unremarkable. Coronary angiography revealed a thrombotic lesion at the middle portion of the left anterior descending artery with 100% occlusion.

He underwent percutaneous coronary intervention and stent placement. There was no intravascular dissection or plaque rupture identified in the intravascular ultrasoundogram. His hypercoagulability workup was non-contributory. He improved and was subsequently discharged.

Discussion
CAD is rare in young patients; the prevalence of CAD and MI in 20 to 39-year-olds is 1.2% and 0.3% respectively. Conventional CAD risk factors in the younger population manifest differently with smoking being the strongest independent risk factor. Factors such as use of tobacco, alcohol, and cocaine are independently associated with premature CAD. Family history of CAD is also an important component of premature CAD and predisposes to severe coronary atherosclerosis.

CAD in younger populations usually presents with single-vessel disease, higher rates of normal coronary vessels on angiography, occlusive thrombus produced by rupture of angiographically invisible plaques, and symptoms of acute coronary syndrome instead of stable angina.

SARS-CoV-2 infection is linked with cardiac injury, particularly predisposing to thrombosis and ischemia via upregulation of inflammatory cytokines that mediate atherosclerosis through local inflammation, hemodynamic changes, and procoagulant factors. Our case was unusual due to lack of age-based risk factors. A positive family history and COVID-19 inflammatory changes were the likely cause of acute MI in our patient.

Conclusion
We report a rare case of acute myocardial infarction in a 20-year-old man due to premature CAD likely accelerated by COVID-19 disease. With the ongoing pandemic, in which an estimated 1 out of 3 Americans have been infected with SARS-CoV-2, clinicians should be cognizant of the sequelae of COVID-19, such as worsening or acceleration of CAD even at younger ages.

References