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# Myocardial Infarction in a Young Female Patient with Subtotal Occlusion of the Mid OM Branch: A Case Report and Review of Potential Causes"

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## Introduction

Chest pain is a common presenting symptom in emergency departments, and its evaluation and management require careful consideration of various potential causes, ranging from benign musculoskeletal pain to serious cardiac conditions. Myocardial infarction (MI) is a well-known cause of chest pain, particularly in older individuals with risk factors such as hypertension, hyperlipidemia, and smoking history. However, MI in young patients without significant risk factors is relatively uncommon and can pose diagnostic challenges. In this case report, we describe the case of a 26-year-old female with no pertinent past medical history who presented to ED with acute chest pain and was diagnosed with a subtotal occlusion of the mid obtuse marginal (OM) branch of the coronary artery requiring two drug eluting stents to be placed.

## Clinical Presentation

The patient, a 26-year-old female, presented to ED with a chief concern of stabbing chest pain that began suddenly on the morning of her arrival. She reported that she was taking her nephews to school when she experienced midsternal stabbing chest pain that radiated down her left arm and to her right shoulder. Despite initially attempting to continue her daily activities, the pain did not resolve, and she was eventually driven to the emergency department by her boss.

On arrival to the emergency department, the patient was slightly hypertensive, with a blood pressure reading of 146/82 mmHg. She denied any significant past medical history, including no known history of hypertension, diabetes, hyperlipidemia, or smoking. Laboratory tests, including complete blood count (CBC) and comprehensive metabolic panel (CMP), lipid panel and urine drug screen were all unremarkable. However, troponin levels were elevated at 0.1 ng/mL on initial presentation and increased to 0.76 ng/mL on repeat measurement after a few hours, raising concerns for possible myocardial injury. An electrocardiogram (EKG) was performed and did not show any signs of ST-segment elevation myocardial infarction (STEMI) Chest x-ray was also unremarkable.

Despite the absence of definitive findings on initial evaluation, the persistence of chest pain and the concerning troponin levels prompted the decision to start the patient on a heparin drip and transfer her to a tertiary care center, for further evaluation and management. On arrival the patient was evaluated by the cardiology team. A thorough review of her history, physical examination, and laboratory results raised suspicion for an acute coronary syndrome, despite her young age and lack of significant risk factors. Therefore, a left heart catheterization was performed on 3/31 to further evaluate her coronary arteries.

The left heart catheterization revealed a subtotal occlusion (99% stenosis) of the mid OM branch of the coronary artery, confirming the diagnosis of MI. The decision was made to intervene, and two drug-eluting stents were successfully placed during the procedure. The patient tolerated the intervention well without any complications. After the procedure, the patient was started on aspirin and Brilinta, a high-intensity statin, carvedilol, and lisinopril, which are standard medications for post-MI management. She was also counseled on lifestyle modifications, including smoking abstinence, healthy diet, and regular exercise.

## Discussion

The patient's young age of 26 years is noteworthy as MI is relatively rare in young adults, and the etiology of MI in this age group may differ from older individuals. While traditional risk factors for cardiovascular disease, such as hypertension, hyperlipidemia, and diabetes, are less common in young patients, other factors, including genetic and lifestyle-related factors, may play a role in the pathogenesis of MI in this population [1].The patient's chief concern of midsternal stabbing chest pain radiating down her left arm and right shoulder, along with elevated troponin

levels, is suggestive of acute coronary syndrome (ACS), which encompasses both ST-segment elevation myocardial infarction (STEMI) and non-ST-segment elevation myocardial infarction (NSTEMI). The absence of ST-segment elevation on the initial electrocardiogram (EKG) does not rule out ACS, as up to 50% of patients with MI may have initially normal EKG findings (Devi et al., 2018). This highlights the importance of considering MI as a differential diagnosis in young patients with chest pain, even in the absence of typical EKG findings.

The potential causes of CAD in this young patient with no significant past medical history and lacking traditional risk factors for cardiovascular disease are noteworthy and require discussion. There are severe potential causes of CAD in a young patient with no significant past medical including:

1. Spontaneous coronary artery dissection (SCAD): SCAD is a rare but increasingly recognized cause of MI, especially in young individuals, and is characterized by a tear in the coronary artery wall leading to intramural hematoma and subsequent arterial occlusion [2].

2. SCAD is often associated with fibromuscular dysplasia, a non-atherosclerotic arterial disease, and hormonal factors such as pregnancy and oral contraceptive use [2].

3. Coronary Vasospasm: Coronary vasospasm, also known as Prinzmetal's angina or variant angina, is a condition characterized by transient episodes of coronary artery spasm leading to reduced blood flow to the heart muscle and potential myocardial ischemia. It can result in STEMI in some cases [3]. This condition can be triggered by various factors such as stress, drug use (eg, cocaine), and endothelial dysfunction.

4. Drug-induced MI: Certain drugs, such as cocaine, amphetamines, and other illicit substances, as well as some prescription medications, can cause MI by various mechanisms, including vasoconstriction, increased heart rate, and increased myocardial oxygen demand [4]. It is important to consider drug use or exposure in the history of young patients presenting with STEMI.

5. Thrombophilia: Inherited or acquired thrombophilic conditions, such as factor V Leiden mutation, antiphospholipid syndrome, or protein C or S deficiency, can increase the risk of thrombotic events, including MI [1].

6. Inflammatory and autoimmune conditions: Inflammatory and autoimmune conditions, such as systemic lupus erythematosus (SLE) and rheumatoid arthritis, have been associated with increased cardiovascular risk, including MI, due to chronic inflammation and immune dysregulation [5]. Young patients with a history of autoimmune conditions may require careful evaluation for cardiovascular risk factors and appropriate management.

7. Genetic disorders: Rare genetic disorders, such as familial hypercholesterolemia, which is characterized by elevated LDL cholesterol levels, and other genetic conditions affecting lipid metabolism and coagulation, can predispose young individuals to CAD and subsequent MI [6]. Genetic testing may be indicated in certain cases to identify underlying genetic causes of MI.

8. Other risk factors: Other risk factors for MI in young individuals include vasculitis, congenital anomalies of the coronary arteries, chronic kidney disease, and HIV infection.

## Conclusion

This case highlights the importance of thorough evaluation and management of chest pain in young patients, even in the absence of significant risk factors for cardiovascular disease. It is important to note that the exact cause of STEMI in this patient would require further investigation, including a more detailed clinical evaluation, laboratory tests, imaging studies, and potentially genetic testing, to identify any underlying conditions or risk factors. Prompt evaluation, appropriate treatment and close follow-up are crucial in managing MI in young patients.

## References

1. Devi P, Jain SK, Singh A (2018) Acute myocardial infarction in young adults: Risk factors and approach to management. Current Cardiology Reports 20(10): 87.

2. Tweet MS, Hayes SN, Codsi E, Gulati R, Rose CH, et al. (2018) Spontaneous coronary artery dissection associated with pregnancy. Journal of the American College of Cardiology 72(14): 1713-1720.

3. Ong P, Athappan G, Seeburger J (2018) Vasospastic angina: a concise review. European Cardiology Review 13(2): 91-95.

4. Richards JR, Bretz SW, Johnson EB (2018) Drug-induced myocardial infarction. The Journal of Emergency Medicine 55(2): 265-273.

5. Denny KJ, Coulthard LG, Drayson MT (2018) Inflammatory and autoimmune conditions and their relationship to cardiovascular disease risk. Current Rheumatology Reports 20(12): 75.

6. Mach F, Baigent C, Catapano AL, Koskinas KC, Casula M, et al. (2020) 2019 ESC/EAS guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk: The Task Force for the management of dyslipidaemias of the European Society of Cardiology (ESC) and European Atherosclerosis Society (EAS). European Heart Journal 41(1): 111-188.


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