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Case Report

Unmasking the silent threat: ST-elevation myocardial infarction in 37-year-old woman

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ABSTRACT

Background: ST-elevation myocardial infarction (STEMI) has been traditionally associated with elderly males; however, its prevalence is on the rise among young women. Women often manifest with non-atherosclerotic causes of ischemic heart disease, including plaque erosion and spontaneous coronary artery dissection (SCAD); while atypical symptoms and other pathophysiological processes often result in delay in diagnosis and diagnostic or treatment differences. This case underscores the crucial role of early recognition of atypical symptoms, careful assessment of risk factors, and thoughtful selection of the best management strategies.
Case Presentations: A 37-year-old woman with inadequately controlled hypertension, who did not have any traditional risk factors, presented to the emergency department with diaphoresis and epigastric pain. Initial electrocardiogram (ECG) showed inferoposterior STEMI, and coronary angiography revealed total mid RCA occlusion with nonsignificant LAD stenosis. She was immediately taken to the cath lab and primary PCI was performed with direct stenting to improve myocardial perfusion. After PCI, the patient experienced uneventful TIMI III flow restoration and was discharged on DAPT and optimal medical therapy. She was asymptomatic at the one-year follow-up, which underscores the efficacy of direct stenting in specific STEMI.
Conclusions: Young women with STEMI represent a distinct and under-recognized group requiring sex specific risk stratification and tailored management to improve outcomes. Further research is needed to identify optimal therapeutic strategies for this population.

1. Introduction

New data indicate an increasing prevalence of acute myocardial infarction (AMI) in young women, a trend that has emerged despite coronary artery disease (CAD) historically being associated with elderly men[1]. This contradicts the historical stereotype that AMI is a male-related disease and highlights the importance of increasing awareness, early diagnosis, and more personalized treatments for AMI. As indicated in the INTERHEART study, which included over 52,000 MI patients,women will often have their first coronary event about 10 years later than men, and after menopause. But AMI in young women is uncommon and prompt recognition of that entity is important because of its important health and socioeconomic implications[2].

Young women commonly have atypical symptoms like right sided chest pain, and neck, or shoulder pain, and non specific ECG changes leading to late diagnosis and inconsistent management. Despite receiving similar medical therapy, young women have higher 30-day and 1-year mortality rates compared to men[3]. Additionally, many are of reproductive age or serve as primary income earners, yet studies show lower return-to-work rates post-AMI, even after adjustment for demographic and occupational factors[2]. Here we reported a case of STEMI in a young woman, and emphasized the presentation, management, and outcomes of this, with the need for broader, sex specific cardiovascular strategies.

2. Case Presentation

A 37-year-old woman was brought to the emergency room with 6 hours of exertional epigastric pain, nausea, vomiting, and diaphoresis, but no chest pain or palpitations. She had uncontrolled hypertension and denied any other cardiovascular risk factors, including autoimmune disease, oral contraceptive use, or complications during previous pregnancy and delivery. Laboratory assays indicated RBG 134 mg/dL, LDL 34 mg/dL, and elevated HS-troponin I (912.9 ng/L). On examination, she was in mild respiratory distress (BP 160/90mmHg, HR 92 bpm, SpO_2 99%, BMI 24.97 kg/m^2) and physical examination was otherwise unremarkable. The patient's chest X-ray showed cardiomegaly without pulmonary edema. ECG showed sinus tachycardia with ST-elevation in the II, III, aVF, and posterior leads V7–V9, compatible with inferoposterior STEMI (Figure.1).

Echocardiography revealed inferior wall hypokinesia and grade I diastolic dysfunction. Coronary angiography revealed a diffuse tubular stenosis extending from the proximal RCA, ending in a total occlusion of the mid-RCA, as well as a 30% stenosis in the proximal LAD (Figure. 2 (left)).

Primary PCI was performed, achieving TIMI III flow (Figure. 2 (right)). She was treated with dual antiplatelet therapy (aspirin and ticagrelor), high intensity statin, beta-blocker, and ARB. Her recovery was uneventful, and she was discharged after 72 hours. At one-year follow-up, the patient remained asymptomatic with no recurrent events. DAPT was safely de-escalated to aspirin only.

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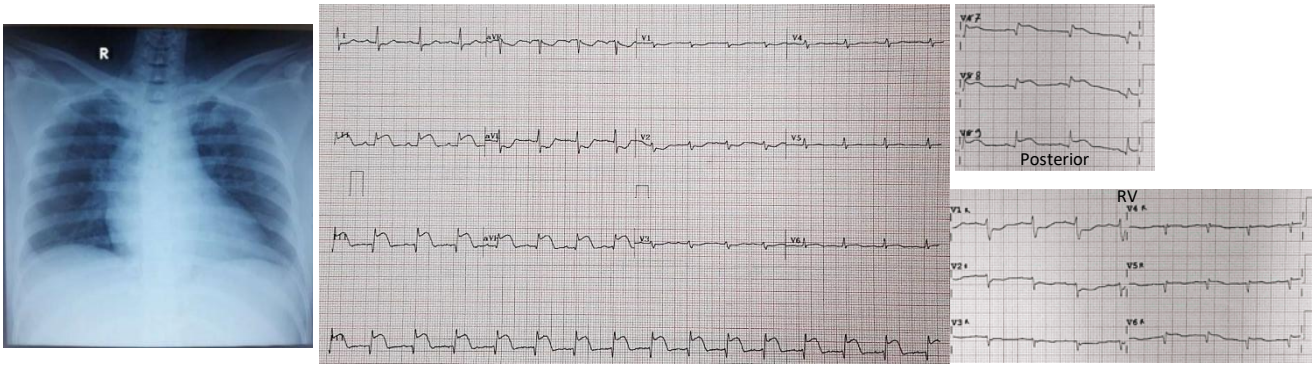

Figure. 1. CXR (left) and ECG showed and ST elevation in inferior-posterior leads (right)

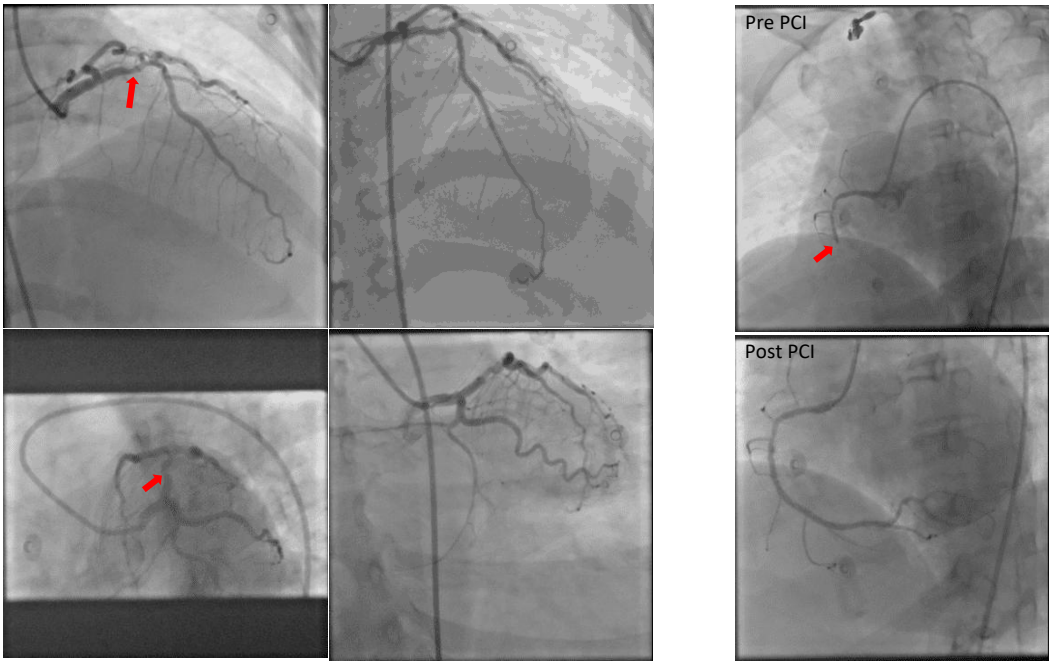

Figure. 2. Coronary angiography and pre-post PCI procedure

3. Discussion

This case emphasizes an uncommon presentation of ST-elevation myocardial infarction, or in a 37-year-old woman, which is likely the result of plaque rupture or erosion. The prevalence of myocardial infarction (MI) among young women remains low, despite the increasing recognition of this condition in young adults[4]. Ischemic heart disease (IHD) typically occurs later in women than in men due to the vasoprotective role of estrogen, which inhibits vascular smooth muscle proliferation, enhances nitric oxide production, and modulates prostaglandin synthesis[5]. Nevertheless, this protective effect is reduced in the presence of conventional cardiovascular risk factors, including hypertension, diabetes, obesity and smoking, as well as non-conventional risk factors such as inflammatory diseases or hormonal disturbances[6].

Clinically, women with ACS often present atypically with symptoms such as epigastric pain, nausea, or fatigue leading to delayed diagnosis and intervention. The absence of chest pain is associated with higher in-hospital mortality, as shown in the GENESIS-PRAXY and INTERHEART studies. Notably, tobacco use remains the most significant modifiable risk factor in women under 55, increasing AMI risk sevenfold, though risk normalizes within 10–15 years of cessation[7]. Hypertension and diabetes disproportionately elevate cardiovascular risk in women. In 2010, over 1.3 billion individuals were hypertensive, and eliminating hypertension could reduce MI incidence by 31%. Women with diabetes experience a four- to fivefold increased risk of cardiovascular events, exceeding the two- to threefold increase observed in men[8]. In addition, further screening for connective tissue disorders and autoimmune diseases was considered, as several reports have described an association between STEMI in young women and these conditions[9]. Risk factor management should be optimized to prevent future recurrence.

From a pathophysiological standpoint, young women more often exhibit plaque erosion or spontaneous coronary artery dissection (SCAD)[10] than plaque rupture. Autopsy data show plaque rupture in 76% of fatal MI in men versus 55% in women. In this case, coronary angiography revealed a long, smooth, tubular stenosis without a visible dissection plane, ending in a total occlusion without any significant atherosclerotic lession in other epicardial arteries, suggestive of type 2 SCAD. Although OCT/IVUS may see intramural hematoma or a double lumen and give management consideration wether conservative or invasive strategy, it was not performed routinely. We decided invasive strategy because of unstable presentation and ongoing iscahemia. In the setting of STEMI, proximal culprit lession without significant calcification and angulation, direct stenting (DS) was chosen to minimize vascular injury and distal embolization. While meta-analyses show mixed results, observational studies support DS as beneficial in select cases, improving reperfusion and reducing infarct size[11].

4. Conclusion

Early recognition of atypical symptoms in young women is crucial for lifesaving. Acute coronary syndrome can occur in young women, particularly in the presence of conventional or non-conventional risk factors. Identifying and addressing these factors may improve long-term prognosis. STEMI in young women is not always caused by plaque rupture, and direct stenting may be considered as an alternative PCI strategy to conventional pre-dilatation stenting.

5. Declaration

5.1 Ethics Approval and Consent to participate
Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

5.2. Consent for publication
Not applicable.

5.3 Availability of data and materials
Data used in our study were presented in the main text.

5.4 Competing interests
The authors declare no conflict of interest related to this publication.

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5.6 Authors contributions
Idea/concept: ZA, JB, RTY, MM, and YA. Design: ZA, JB, and RTY. Control/supervision: JB and YA. Data collection/processing: ZA, JB, RTY, and MM. Extraction/Analysis/interpretation: ZA, JB, RTY, MM, and YA. Literature review: D ZA, JB, RTY, MM, and YA. Writing the article: ZA, JB, RTY, MM, and YA. Critical review: ZA, JB, RTY, MM, and YA. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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References

1. Nowbar AN, Gitto M, Howard JP, Francis DP, Al-Lamee R. Mortality from ischemic heart disease: Analysis of data from the world health organization and coronary artery disease risk factors from NCD risk factor collaboration. *Circ Cardiovasc Qual Outcomes*. 2019;12(6):1-11. doi:10.1161/CIRCOUTCOMES.118.005375

2. Cenko E, Yoon J, Kedev S, et al. Sex differences in outcomes after STEMI effect modification by treatment strategy and age. *JAMA Intern Med*. 2018;178(5):632-639. doi:10.1001/jamainternmed.2018.0514

3. Rehman S ur, Siddiqui A, Almas A, Hameed Khan A. Young South Asian Women with ST Elevation Myocardial Infarction (STEMI)-Should we be Worried? *Cardiol Cardiovasc Med*. 2022;06(02):83-91. doi:10.26502/fccm.92920246

4. Dreyer RP, Xu X, Zhang W, et al. Return to work after acute myocardial infarction: Comparison between young women and men. *Circ Cardiovasc Qual Outcomes*. 2016;9(2_suppl_1):S45-S52. doi:10.1161/CIRCOUTCOMES.115.002611

5. Arnett DK, Blumenthal RS, Albert MA, et al. *2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines*. Vol 140.; 2019. doi:10.1161/CIR.0000000000000678

6. van Oosterhout REM, de Boer AR, Maas AHEM, Rutten FH, Bots ML, Peters SAE. Sex differences in symptom presentation in acute coronary syndromes: A systematic review and meta-analysis. *J Am Heart Assoc*. 2020;9(9). doi:10.1161/JAHA.119.014733

7. Critchley JA, Capewell S. Mortality Risk Reduction Associated With. Published online 2015.

8. Kalyani RR, Lazo M, Ouyang P, et al. Sex differences in diabetes and risk of incident coronary artery disease in healthy young and middle-Aged adults. *Diabetes Care*. 2014;37(3):830-838. doi:10.2337/dc13-1755

9. Saw J, Humphries K, Aymong E, et al. Spontaneous Coronary Artery Dissection: Clinical Outcomes and Risk of Recurrence. *J Am Coll Cardiol*. 2017;70(9):1148-1158. doi:10.1016/j.jacc.2017.06.053

10. Vrints CJM. Spontaneous coronary artery dissection. *Heart*. 2010;96(10):801-808. doi:10.1136/hrt.2008.162073

11. Azzalini L, Millán X, Ly HQ, L'Allier PL, Jolicoeur EM. Direct stenting versus pre-dilation in ST-elevation myocardial infarction: A systematic review and meta-analysis. *J Interv Cardiol*. 2015;28(2):119-131. doi:10.1111/joic.12190