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Case Report

ST-segment elevation in chronic bleeding post-curettage with COVID-19 antibodies: A case report

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ABSTRACT

Background: Acute coronary syndrome has a variety of symptoms and remains poorly under diagnosed and under treatment in women, especially myocardial infarction or ischaemic with non-obstructive coronary arteries (INOCA) as the culprit. We present a case of an Indonesian adult female with hypoxemia and ST-elevation in post-curettage due to molar pregnancy and positive COVID-19 antibodies.
Case Presentation: A 43-year-old Indonesian female was admitted due to confusion, dyspnoea, and chronic bleeding after the curettage. The electrocardiogram (ECG) showed ST-elevation in lead I and aVL. Her condition quickly stabilised after getting oxygen supplementation and nitro-glycerine with ST-elevation resolution and no neurological impairments. Due to COVID-19 pandemic, she was checked for a swab test which showed negative but positive on her antibodies test. Chest X-ray was normal, but the echocardiography showed mild left atrial dilatation. After standard atherosclerosis treatment and anticoagulant, her condition improved, despite recurring vaginal bleeding. During her outpatient follow-ups, suspected intrauterine leiomyoma was diagnosed by ultrasound.
Discussion: Cytokines and inflammatory responses from prolonged bleeding, hormones, metabolic disturbances, and post-COVID-19 infection have the potential to provoke INOCA. Considering the complexity of our case, contributing factors to INOCA must be addressed to optimise the strategy. Further, imaging tests should be done to confirm the diagnosis.

1. Introduction

Acute coronary syndrome (ACS) symptoms can differ from chest pain, shortness of breath, palpitation and even dizziness. Having higher mortality and more unusual pathophysiology mechanism than men, diagnosing and managing angina in women become a challenge.[1] Stress, hormonal and pregnant-related has been associated with atherosclerosis and myocardial infarction or ischaemic with non-obstructive coronary arteries (INOCA) in women.[2,3] Moreover, after the coronavirus disease 2019 (COVID-19) pandemic, the incidence of endothelial injury and stiffness increased, accompanied by the risk of a hypercoagulation state.[4]

Herein, we present a case of an Indonesian adult female with hypoxemia and ST-elevation in post-curettage due to molar pregnancy and positive COVID-19 antibodies.(Table 1)

2. Case Presentation

A 43-year-old Indonesian female presented to the emergency department with a worsening confusion state for two hours after she got up in the morning. She had shortness of breath, palpitation, cold sweats, cough and febrile, especially in the morning, for three days. Her family

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Table 1: Timeline

Date	Clinical Events
4 May 2021	Presented with miscarriage. Haemoglobin (Hb) was 11.5. COVID-19, IgG and IgM antibodies were positive, while the ultrasound showed molar pregnancy. Curettage was performed.
29 May 2021	To a different hospital with dyspnoea, cough and feverish. Patient was sent home with antibiotics.
1 June 2021	Presented to the emergency department with confusion, dyspnoea, cold sweats, feverishness, and chronic vaginal bleeding. Oxygen saturation 88%, and the electrocardiogram showed ST-elevation in lead I and aVL. Chest X-ray was normal. Supplemental oxygen and nitroglycerine were given.
1 hour later	Hb was 10.1. ST-elevation improved, and there was no neurological impairment.
5 June 2021	Dyspnoea improved, but dose adjustment was required due to recurring vaginal bleeding. Echocardiography showed normal function.
7 June 2021	Patient was discharged home.
June-July 2021	Last follow-up: patient was stable, with minimal vaginal bleeding and normal echocardiogram. Ultrasound showed suspected intrauterine leiomyoma. The patient did not return to the clinic.

denied any history of sudden weight loss, syncope, rashes, diabetes mellitus, hypertension, or any cardiovascular history in the family. She had taken paracetamol, n-acetyl cysteine, and cefixime without improvement. Furthermore, her vagina had active bleeding for a month after undergoing curettage due to hydatidiform mole. The result from the sample was residues of conception without signs of malignancy. She was given misoprostol for three weeks for her post-curettage bleeding.

She was obese (BMI 37). Her Glasgow Coma Scale was E4M5V3, accompanied by apathy. The vital signs were normotension, tachycardia (140 times a minute), dyspnoea with oxygen saturation of 88%, and subfebrile. Her physical exam was normal. Her vaginal examination showed cervix dilation (2 cm) and small bleeding (15 cc). Other than positive troponin T (261 ng/L, with baseline <50 ng/L), haemoglobin 10.1 g/dL, and alkalosis respiratory (pCO_2 26 mmHg, HCO_3^- 21 meq/L), her initial laboratory findings were unremarkable. The pregnancy strip was positive. During her last month's admission, COVID-19, IgG and IgM antibodies were positive without prior vaccination. However, her current COVID-19 PCR and before curettage were negative, and she denied any hospitalisation due to COVID-19. Her chest X-ray showed no abnormalities (Figure 2 a).

After getting 10 litres per minute non-rebreathing mask, her confusion improved rapidly without any residual neurological impairment. We obtained her first electrocardiogram (ECG), which revealed ST-segment elevation in the lead I and aVL, and ST-segment depression (Figure 1 a). We added nitroglycerine sublingual. Due to not having a Cath lab, we discussed the fibrinolytic option with her family, but they declined. One hour after her condition improved, we obtained another ECG, which revealed heart rate and ST-segment improvement without Q waves (Figure 1 b & C). Our working diagnosis was ST-elevation myocardial infarction, with a differential diagnosis being vasospastic or dissection. Maintenance fluid, clopidogrel and aspirin once a day, fondaparinux sodium intravenous (IV) 2.5 mg once a day for five days, and atorvastatin 20 mg once a day were given. We consulted a pulmonologist and obstetrician and planned for levofloxacin IV 750 mg once a day and n-acetyl cysteine 400 mg three times a day and admitted her into intensive care.

Her second COVID-19 PCR and HIV test was negative, C - reactive protein 32.59 mg/dL, d-Dimer 1,363 ng/mL. We added bisoprolol 2.5 mg once a day. She had no additional symptoms other than recurring vaginal bleeding, so we had to lower the fondaparinux dose and stop the aspirin. Her ECG was constant for the remainder of her hospitalisation. On the fifth day, another chest X-ray was performed (Figure 2 b). Our echocardiography showed mild left atrial (LA) dilatation (M-Mode LA/Ao 1.42, LA diameter 4.4 cm) with global normokinetic, and ejection fraction 73%, normal RV and valves function. Her dyspnoea subsided completely after the fifth day. Before being discharged on the seventh day, her blood tests were haemoglobin 9.8 g/dL, d-Dimer 332 ng/dL with normal PT and APTT.

She regularly checked up for a couple of months after being discharged and was given atorvastatin 20 mg once a day, bisoprolol 5 mg once a day and candesartan 8 mg once a day without any symptoms other than a few vaginal bleedings. Her latest gynaecology ultrasound showed an intrauterine mass suspected of leiomyoma, while echocardiography remained the same. Unfortunately, the patient was soon lost to follow-up.

3. Discussion

ST-elevation has been mostly associated with plaque rupture, followed by the non-obstructive culprit in 25%, and coronary artery dissection in 10.8% of women <50 years.[1] Through our investigation, we suspected INOCA, might be accompanied by atherosclerosis or microthrombus. Hadi HM et al.[5] reported vasospasm elicited by the mismatch in fluid balance in post-operation with substantial bleeding, while in Ruisi M et al.[6] was caused by severe anaemia in acute gastrointestinal bleeding. Maladaptive platelet, especially in late-onset trauma, can impair calcium mobilisation and stimulate vasoconstrictors like endothelin-

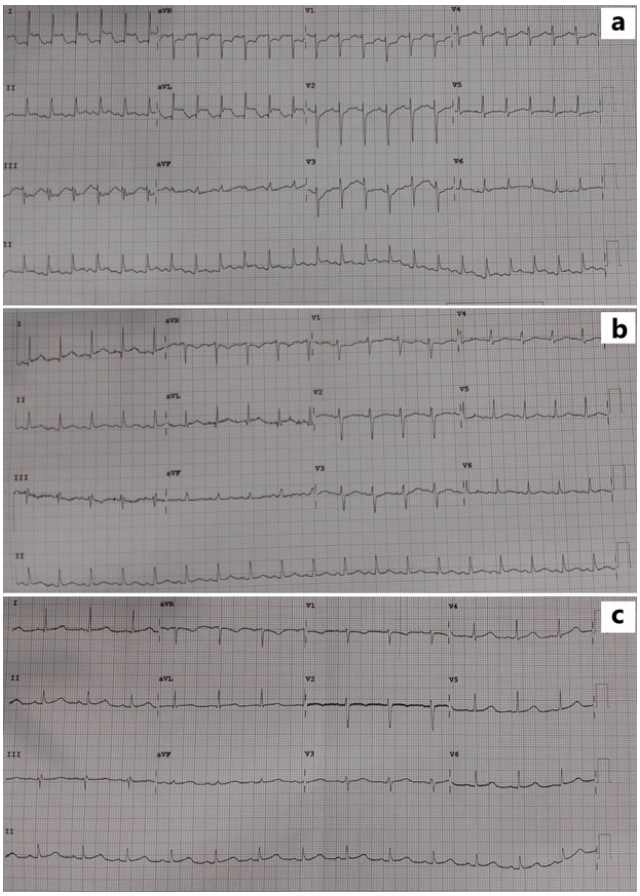

Figure 1: ECG during inpatient (**a**) showed sinus tachycardia, ST-segment elevation in the lead I and aVL, and ST-segment depression in lead III and V1-V4. Compared to the second ECG after getting supplemental oxygenation and nitroglycerin (**b**) and her daily ECG (**c**), which showed ST-segment had normalised

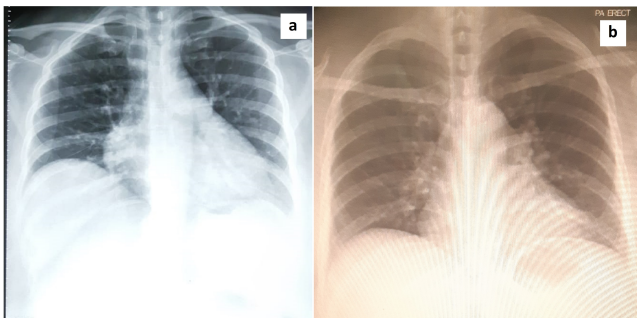

Figure 2: Thorax X-ray with AP view during inpatient (**a**) and PA view on the fifth day (**b**) showed normal cardiac size and lungs and no new abnormalities

1 (ET-1) and pro-coagulation factors (such as thromboxane A_2). Inflammatory cytokines and high CRP have been reported during vasospasm angina. Alkalosis is also noted as vasoconstrictor stimuli.[7,8] Our main limitation is without further investigation such as coronary angiography, we cannot conclude our diagnosis.

Hormonal, especially β-HCG, is known to stimulate ovarian and placental prorenin, activating renin, angiotensin, and aldosterone system (RAAS), possibly linked to coronary vasospasm.[2,9] Another interesting note is that leiomyoma has been associated with hormone dysregulation and RAAS. Furthermore, ET-1 is released from uterine smooth muscle and has mitogenic effects on leiomyoma through multiple pathways.[10,11] With positive COVID-19 antibodies, we suspected ET-1 dysregulation complicates her condition by promoting microvascular endotheliopathy, vasoconstriction and hypercoagulable state even after three months of acute infection.[4] Thus, there could be a connection between the prolonged bleeding, circulating endothelin-1, and systemic vasospasm, which leads to hypoxia, confusion and coronary dysfunction.

Due to the suspected INOCA and without angiography for guidance, we managed the patient in a multidiscipline.[3] With the high D-dimer, anticoagulants and antiplatelets are known to reduce microthrombus and embolism in late-onset trauma.[8] Beta-blocker shows a reduction of major adverse cardiovascular events (MACE) and symptoms of microvascular dysfunction. Statin and antiplatelet also are associated with better clinical outcomes in women with INOCA. Unfortunately, there is no evidence of significant mortality reduction when using the atherosclerotic treatment for INOCA, and further research is still undergoing.[3,12,13]

4. Conclusion

INOCA symptoms can be varied. Understanding the aetiology and the contributing factors can help diagnose and improve the outcome. With few treatment recommendations for INOCA and a lack of facilities, we optimise our strategy based on the possible mechanisms. Research about INOCA in women (especially after COVID-19 pandemic) and treatment must be considered since the risk of underdiagnosed and under treatment can lead to a poorer prognosis.

5. List of Abbreviations

ACS: Acute coronary syndrome; APTT: Activated partial thromboplastin time; COVID-19: Coronavirus Disease 2019; ET-1: Endothelin-1; MACE: Major adverse cardiovascular event; INOCA: Ischaemic with non-obstructive coronary arteries; PCR: Polymerase chain reaction; PT: Prothrombin time; RAAS: Renin, angiotensin, and aldosterone system.

6. Patient Consent

The patient consented to participate in the study. Informed written consent was obtained and signed to publish this case report and any accompanying images from the patient in line with COPE guidance.

7. Conflict of Interest

All authors have no conflict of interest to declare.

8. Source of Funding

Not applicable.

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