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Repeat Acute Coronary Syndrome Following Percutaneous Coronary Intervention: A Case Report

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ABSTRACT

Keywords: *Acute Coronary Syndrome; Percutaneous Coronary Intervention; Recurrent Ischemic Event, Diabetes Mellitus; Case Report*

Percutaneous coronary intervention (PCI) is the primary reperfusion strategy for ST-elevation myocardial infarction (STEMI). Despite high procedural success rates, patients remain at risk for recurrent acute coronary syndrome (ACS), particularly those with significant comorbidities. We report a case of recurrent ACS in a patient less than one year following successful primary PCI. A 50-year-old female presented to the emergency department with typical angina, shortness of breath, nausea, and diaphoresis. Her medical history was significant for hypertension, type 2 diabetes mellitus, and a STEMI treated with primary PCI five months prior. Despite reported adherence to dual antiplatelet therapy (DAPT), she presented with tachycardia (104 bpm) and hypotension (155/55 mmHg). Electrocardiography revealed sinus tachycardia with pathological Q waves in leads V1–V4, consistent with a prior anterior myocardial infarction. Laboratory evaluation demonstrated hyperglycemia (228 mg/dL) and elevated cardiac troponin (44.2 ng/mL). The patient was diagnosed with recurrent ACS superimposed on an old anterior myocardial infarction. She was stabilized with loading doses of aspirin and clopidogrel and admitted to the Intensive Cardiac Care Unit (ICCU) for guideline-directed medical therapy, including beta-blockers and high-intensity statins. She was discharged in stable condition after five days. This case illustrates that recurrent ACS can occur shortly after successful revascularization, specifically in patients with persistent cardiovascular risk factors such as uncontrolled hyperglycemia and hypertension. It highlights the critical importance of aggressive secondary prevention, strict glycemic control, and close follow-up to mitigate the risk of adverse cardiac events in the post-PCI period.

INTRODUCTION

ST-Elevation Myocardial Infarction (*STEMI*) is a specific condition within *Acute Coronary Syndrome* (*ACS*) where plaque disruption and clot formation in a coronary artery severely reduce blood flow to the heart (Akbar & Mountfort, 2024; Bubulytė & Maneikienė, 2024; Karthikeyan et al., 2023; Popovic et al., 2018).

In patients with *STEMI*, reperfusion therapy is required to restore blood flow through the coronary artery. Reperfusion therapy can be achieved pharmacologically with fibrinolytic treatment or mechanically with primary *percutaneous coronary intervention* (*PCI*) (Kakavand et al., 2021; Li et al., 2022; Pelliccia et al., 2023; Schaefer et al., 2022).

Despite the high success rates of *PCI* in restoring coronary patency, patients remain at risk for recurrent ischemic events. Factors such as in-stent restenosis, development of new lesions, or incomplete initial treatment can lead to a repeat *ACS* event (Bai et al., 2025; Cho, 2017; Wang et al., 2020; Zhang et al., 2022).

This report presents the case of a patient who experienced a repeat *ACS* event less than one year after a successful *PCI* for *STEMI*, highlighting the diagnostic and therapeutic complexities involved (Gao et al., 2018; Kodeboina et al., 2023; Moras et al., 2024; Smith et al., 2015).

The objective of this case report is to describe and analyze an instance of recurrent *Acute Coronary Syndrome* (*ACS*) occurring within one year following a successful primary *Percutaneous Coronary Intervention* (*PCI*). This report aims to detail the clinical presentation, examine the potential contributing risk factors and pathophysiology—focusing on the roles of uncontrolled diabetes and hypertension—and discuss the diagnostic challenges in identifying recurrent ischemia in a patient with a prior myocardial infarction. Furthermore, it seeks to review appropriate management strategies and secondary prevention measures in accordance with current guidelines to mitigate the risk of future adverse cardiac events in high-risk post-*PCI* patients (Xi et al., 2025; Yuan et al., 2025).

This case report provides clinical value by enhancing awareness among clinicians of the potential for recurrent *ACS* even after successful revascularization, emphasizing the critical importance of strict glycemic and blood pressure control, as well as optimal antiplatelet therapy selection in secondary prevention. Academically, it contributes a documented case to the literature on disease progression and management complexities in post-*PCI* patients with significant comorbidities, serving as a foundation for further investigation into predictive factors and more effective intervention strategies. For patients and the healthcare system, it underscores the necessity of patient education, medication adherence, and rigorous long-term follow-up after *PCI*, thereby advocating for more aggressive and structured secondary prevention programs to improve long-term patient outcomes and reduce the overall burden on healthcare systems.

RESEARCH METHOD

A 50-year-old female presented to a district hospital at approximately 01:15 AM with a chief complaint of squeezing chest pain. The pain, which was non-radiating, was accompanied by shortness of breath, nausea, and cold sweats. The symptoms began approximately three hours prior to presentation while she was sleeping.

Five months prior, the patient underwent a percutaneous coronary intervention (PCI) for a ST-segment elevation myocardial infarction (STEMI). She also has a history of hypertension and type 2 diabetes mellitus. The patient routinely consumes spironolactone, aspirin, and clopidogrel. She had taken her prescribed doses of one tablet of aspirin and clopidogrel the night before the chest pain began.

On examination, the patient's vital signs were as follows: a blood pressure of 155/55 mmHg, a heart rate of 104 beats per minute, a respiratory rate of 24 breaths per minute, and an oxygen saturation (SpO_2) of 95% on room air. The patient was alert with a Glasgow Coma Scale (GCS) score of 15 (E4V5M6) and rated her pain as 7/10 on a numerical pain scale.

Electrocardiogram (ECG)

Her ECG showed a sinus tachycardia rhythm with a normal cardiac axis and Q waves in leads V1-V4 (Figure 1).

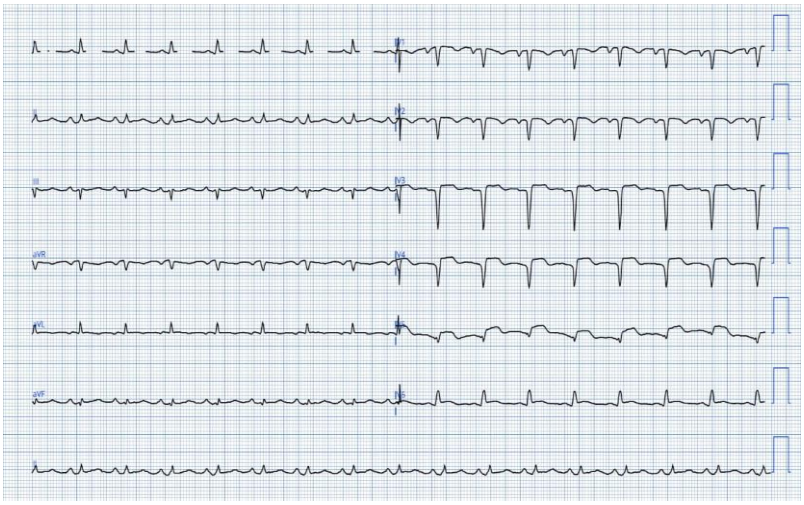

Figure 1. Patient's electrocardiogram showing sinus tachycardia and Q waves in leads V1-V4
Sumber: Rekam medis pasien, 2024

The patient's laboratory examination results were as follows: Complete blood count (CBC) showed a hemoglobin level of 12.9 g/dL (normal value: 12 - 16 g/dL), hematocrit of 37.5% (normal value: 38 - 42%), white blood cell count of 16.79 x 10^9/L (normal value: 4.7 - 11.3 x 10^9/L), and platelets of 248 x 10^9/L (normal value: 142 - 424 x 10^9/L).

The cardiac marker examination was 44.2. Her serum creatinine was 1.09 mg/dL (normal value: 0.6 - 1.1 mg/dL), fasting blood sugar was 228 mg/dL (normal value < 140 mg/dL), BUN was 11.6 mg/dL (normal value: 10 - 20 mg/dL), AST was 32 U/L (normal value: 8 - 31 U/L), and ALT was 35 U/L (normal value: 6 - 31 U/L).

Based on the vital signs, ECG, and lab results, the patient received a diagnosis of Acute Coronary Syndrome, Old Anterior Myocardial Infarction, Hypertension, and Type 2 diabetes mellitus.

She received initial treatment in the emergency room consisting of aspirin (240 mg) and clopidogrel (225 mg).

Following initial stabilization, the patient was immediately transferred from the emergency department to the Intensive Cardiac Care Unit (ICCU) for close monitoring and further management. The patient received the following treatment: Bisoprolol 1x2.5 mg, ISDN 2x5 mg, Aspirin 1x80 mg, Clopidogrel 1x75 mg, Atorvastatin 1x20mg at night, Ramipril 1x2.5 mg at night, Diazepam 2x2 mg, and Furosemide 2x1.

The patient was discharged from the hospital on the fifth day of her stay in stable condition with no complaints of chest pain and normal vital signs.

RESULTS AND DISCUSSION

ST-Elevation Myocardial Infarction is diagnosed by the presence of chest pain with electrocardiographic findings of persistent ST elevation and elevated cardiac biomarkers that signify myocardial injury (Byrne et al., 2023).

Percutaneous Coronary Intervention (PCI) and Fibrinolytic therapy are currently the standard reperfusion strategy for ST-Elevation Myocardial Infarction (STEMI), significantly reducing mortality and improving prognosis (Byrne et al., 2023).

However, despite successful revascularization, patients remain at risk for recurrent cardiovascular events. This case describes a 50-year-old female presenting with recurrent ACS symptoms five months after primary PCI

Recurrent ischemia following PCI is typically attributed to two primary mechanisms: stent thrombosis (ST) and in-stent restenosis (ISR). Stent thrombosis is a catastrophic complication classified based on timing: acute (<24 hours), subacute (1–30 days), late (>30 days to 1 year), and very late (>1 year). In this patient, the recurrence occurred five months post-procedure, falling into the "late" category (Claessen et al., 2014).

While acute and subacute events are often mechanical or procedural in origin, late events are frequently associated with delayed endothelialization or neoatherosclerosis. ISR, conversely, involves the gradual narrowing of the stent due to neointimal hyperplasia (Claessen et al., 2014).

The patient's comorbidities played a significant role in the recurrence of her condition. Type 2 Diabetes Mellitus (T2DM) is a potent independent predictor of adverse outcomes after PCI. Hyperglycemia, as evidenced by this patient's admission blood glucose of 228 mg/dL, induces oxidative stress and endothelial dysfunction, creating a pro-thrombotic and pro-inflammatory environment (Creager et al., 2003).

Diabetic patients often exhibit diffuse coronary artery disease and smaller vessel caliber, which complicates revascularization and increases the risk of ISR (Creager et al., 2003). Additionally, the patient presented with uncontrolled hypertension (155/55 mmHg). Chronic hypertension increases left ventricular afterload and myocardial oxygen demand while simultaneously causing shear stress on the arterial walls, which can destabilize plaque and accelerate atherosclerosis in non-culprit vessels (Kjeldsen, 2018).

Another critical factor in this case is the potential for high on-treatment platelet reactivity (HTPR). The patient experienced this recurrent event while reportedly adherent to Dual Antiplatelet Therapy (DAPT) consisting of Aspirin and Clopidogrel. Current literature suggests that diabetic patients have a higher prevalence of HTPR, leading to insufficient platelet inhibition (Angiolillo et al., 2014).

While the patient was managed with the standard dose of Clopidogrel (75 mg), guidelines suggest that in patients with T2DM or those who experience recurrent ischemic events while on Clopidogrel, switching to more potent P2Y12 inhibitors, such as Ticagrelor or Prasugrel, may be beneficial to reduce the risk of future stent thrombosis or myocardial infarction (Byrne et al., 2023).

Diagnosing recurrent ACS in patients with a history of STEMI presents unique challenges. The electrocardiogram (ECG) in this patient showed Q waves in leads V1-V4, consistent with her previous anterior myocardial infarction. The presence of persistent Q waves and baseline repolarization abnormalities can mask acute ST-segment changes, thereby reducing the ECG's sensitivity for detecting new ischemia (Thygesen et al., 2018; Sandler et al., 2004).

Therefore, the diagnosis relied heavily on the clinical presentation of typical angina and the elevation of cardiac biomarkers (44.2), distinguishing the event from chronic stable angina or non-cardiac chest pain (Byrne et al., 2023; Thygesen et al., 2018).

The patient received comprehensive secondary prevention therapy, including high-intensity statins (atorvastatin) to stabilize plaque, ACE inhibitors (ramipril) to treat hypertension and prevent ventricular remodeling, and β-blockers (bisoprolol) to reduce myocardial oxygen demand (Byrne et al., 2023).

The resolution of symptoms and stabilization of vital signs upon discharge indicate the effectiveness of guideline-directed medical therapy in the acute phase. However, this case report demonstrates that PCI is not a permanent cure but a palliative measure. Long-term prognosis relies on aggressive risk factor modification, maintenance of a healthy diet, and strict adherence to prescribed medications.

CONCLUSION

Although *percutaneous coronary intervention* (*PCI*) effectively restores blood flow in *ST-elevation myocardial infarction* (*STEMI*) patients, they remain vulnerable to recurrent *acute coronary syndrome* (*ACS*) events, particularly with uncontrolled risk factors like hypertension and diabetes mellitus, as illustrated in this case of recurrence less than one year post-*PCI*. The report stresses that *PCI* serves as a palliative measure rather than a cure, highlighting the critical need for aggressive secondary prevention—including strict glycemic and blood pressure control, medication adherence, lifestyle modifications, and rigorous long-term monitoring—to mitigate future cardiac risks. For future research, longitudinal studies should investigate predictive biomarkers and personalized risk-stratification models for post-*PCI* patients with comorbidities to optimize secondary prevention strategies and reduce recurrence rates.

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