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Successful Management of Inferior Wall STEMI in a Patient with Obstructive Three-Vessel Disease, Diabetes Mellitus, and Hypertension: A Case Report

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Abstract **Case Report**

We report the case of a 67-year-old female with a complex medical history, including poorly controlled Type 2 diabetes mellitus, hypertension and recent inferior wall ST-segment elevation myocardial infarction (STEMI). She presented with generalized body aches, arm numbness and vomiting. Coronary angiography revealed severe three-vessel coronary artery disease including a 100% thrombotic occlusion of the right coronary artery (RCA). The patient underwent successful percutaneous coronary intervention (PCI) to both the distal and most-proximal RCA, followed by recommendations for further intervention on the left circumflex (LCx) and left anterior descending (LAD) arteries. This case highlights the challenges and successful management strategies in patients with multivessel coronary artery disease, comorbid diabetes and hypertension.

Keywords: Inferior wall STEMI, Three-vessel disease, Diabetes mellitus, Hypertension, Percutaneous coronary intervention.

INTRODUCTION

ST-segment elevation myocardial infarction (STEMI) represents one of the most critical manifestations of coronary artery disease (CAD) and requires prompt diagnosis and intervention to reduce morbidity and mortality [1]. The typical presentation of STEMI includes chest pain, dyspnoea and other symptoms that drive patients to seek immediate medical attention [2]. However, in specific populations, such as those with diabetes mellitus, myocardial infarction (MI) can present atypically or even silently, complicating both the diagnosis and management [3]. Silent MI, characterized by a lack of classic symptoms is particularly prevalent among patients with diabetes and is associated with a higher risk of adverse outcomes due to delays in detection and treatment [4].

Diabetes mellitus is a significant risk factor for both CAD and silent MI [5, 6]. The pathophysiology of diabetes-related CAD often involves more diffuse and severe atherosclerosis, as well as microvascular dysfunction, which together contribute to a higher incidence of multivessel disease [7]. Moreover, diabetic patients frequently experience autonomic neuropathy, which can diminish the perception of ischemic pain and lead to silent or minimally symptomatic MI [8]. This poses a substantial challenge for clinicians, as the absence of overt symptoms may delay recognizing a potentially life-threatening event.

The management of STEMI in patients with diabetes and multivessel disease is further complicated by these atypical presentations [9]. Given the increased prevalence of silent MI in this population, a high index of suspicion is essential and clinicians must rely heavily on diagnostic tools such as electrocardiography (ECG) and biomarkers like troponins to identify ischemic events promptly [10]. Once diagnosed, the management of STEMI in these patients must be aggressive, including early revascularization through percutaneous coronary intervention (PCI) and comprehensive secondary prevention strategies.

This case report discusses the successful management of a 67-year-old female patient with

diabetes mellitus, hypertension and multivessel coronary artery disease, who presented with generalized symptoms rather than classic chest pain. The patient was found to have an inferior wall STEMI and underwent successful PCI. This case underscores the importance of considering silent MI in the differential diagnosis for diabetic patients presenting with atypical symptoms and highlights the critical role of timely intervention in improving outcomes in this high-risk population.

CASE PRESENTATION

Patient Profile: A 67-year-old female with a history of Type 2 diabetes mellitus (HbA1c: 9.6%), hypertension and recent vaginal hysterectomy presented with generalized weakness, arm numbness and vomiting of one day's duration. The patient reported non-compliance with diabetes medications.

Initial Presentation: On admission, the patient was hemodynamically stable with a blood pressure of 154/74 mmHg and a heart rate of 103 bpm. Physical examination revealed clear chest sounds, a soft, non-tender abdomen and normal central nervous system (CNS) function. At the health centre, there were inferior lead changes and ST depressions initially. However, at the hospital, later developed ST elevations. ECG at the hospital showed ST-segment elevation in inferior leads, consistent with an inferior wall STEMI (Figure 1). Laboratory tests revealed elevated troponin T (510 ng/L) and mildly elevated liver enzymes.

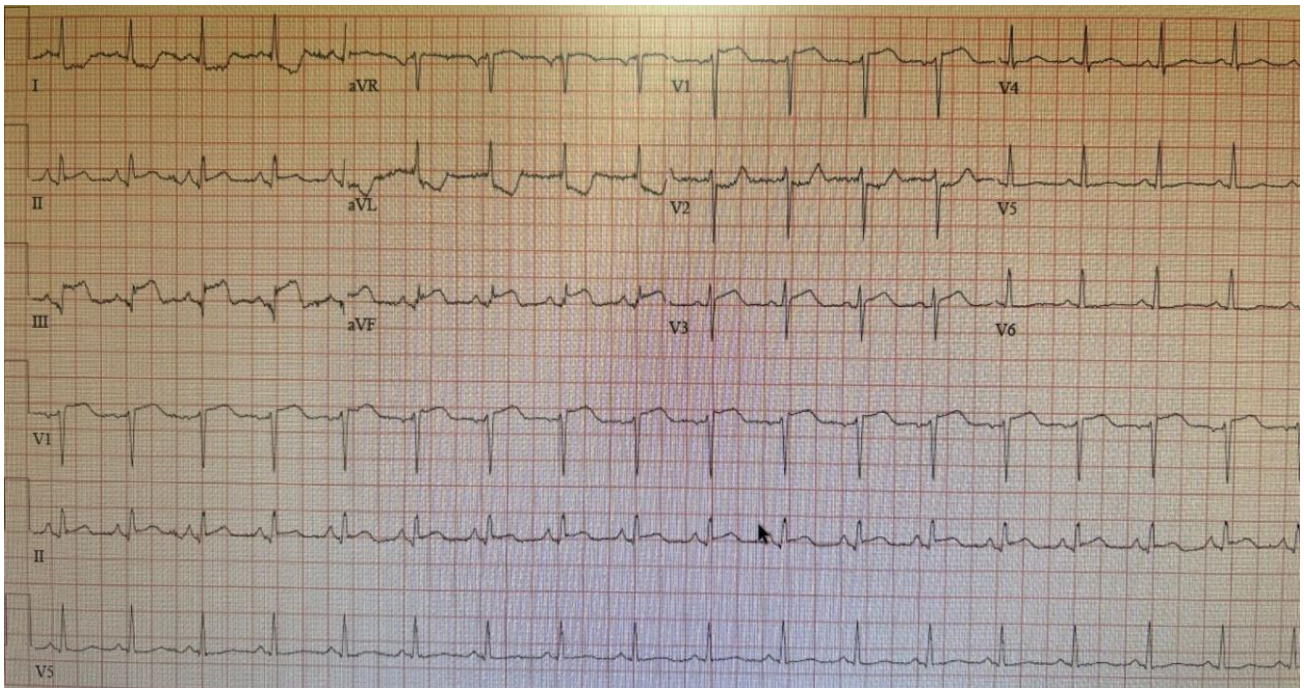

Figure 1: Electrocardiogram of a 67-Year-Old Female Presenting with Inferior Wall STEMI

The 12-lead electrocardiogram (ECG) of the patient reveals ST-segment elevation in the inferior leads (II, III, aVF), consistent with an inferior wall ST-segment elevation myocardial infarction (STEMI). There is also evidence of reciprocal changes in the anterior leads. This ECG was obtained upon the patient's presentation to the emergency department with symptoms of generalized body aches, arm numbness and vomiting. The findings prompted urgent coronary angiography, which confirmed severe three-vessel coronary artery disease and led to successful percutaneous coronary intervention (PCI) to the right coronary artery (RCA).

Social History: The patient is a non-smoker, lives with her son and family and is unemployed. She is sexually active, with a history of condom use and no history of sexual abuse. Family history is significant for diabetes mellitus in her mother and spouse.

Diagnostic Workup: Coronary angiography identified severe three-vessel disease: 100% thrombotic occlusion of the RCA, 80% stenosis of the mid-LAD and 90-95% stenosis of the ostio-proximal LCx. Echocardiography revealed an ejection fraction of 62%, with no regional wall motion abnormalities.

Intervention: The patient underwent urgent PCI, successfully revascularizing the distal and ostio-proximal RCA. Despite the diffuse nature of the vessel disease, the PCI was uneventful. The patient was admitted for further inpatient care with plans for staged intervention on the LCx and LAD. She was started on dual antiplatelet therapy (aspirin and ticagrelor), statins, and anticoagulation with enoxaparin.

Post-Procedural Course: The patient remained stable post-PCI, with no recurrence of chest pain or new ischemic events. Vascular ultrasound of the right radial

artery post-procedure revealed no flow, but no critical stenotic lesions were identified. The patient was counselled on the importance of medication adherence, lifestyle modifications and regular follow-up.

DISCUSSION

The management of STEMI in patients with complex comorbidities such as diabetes mellitus and hypertension is inherently challenging, particularly when complicated by multivessel coronary artery disease (CAD) [9, 11]. This case highlights several key considerations in the management of such high-risk patients.

First, the presence of diabetes mellitus significantly increases the risk for CAD and its complications [12]. In diabetic patients, the prevalence of multivessel disease is higher and the likelihood of silent myocardial infarction (MI) is also increased. Silent MI, characterized by the absence of typical chest pain, can lead to delays in diagnosis and treatment, thereby worsening outcomes [13]. In this case, although the patient presented with symptoms such as generalized body aches and arm numbness, which prompted further investigation, it is conceivable that a silent MI could have been occurring earlier, given her significant risk factors and non-compliance with diabetes management.

The electrocardiogram (ECG) findings of ST-segment elevation in the inferior leads were critical in making the diagnosis of STEMI, which necessitated urgent intervention. The coronary angiography findings of severe multivessel disease, including a 100% thrombotic occlusion of the RCA, underscored the severity of her condition. The successful PCI to the RCA was a crucial step in stabilizing the patient, but the diffuse nature of the disease necessitated a careful consideration of further interventions.

The decision to plan for staged interventions on the LCx and LAD reflects a balanced approach, weighing the risks of immediate versus delayed revascularization. Current guidelines support staged PCI in patients with multivessel disease, particularly when the initial culprit lesion has been successfully treated and the patient is hemodynamically stable.

The ongoing management of this patient focuses on aggressive risk factor modification, including strict glycaemic control, lipid management and lifestyle changes. The initiation of dual antiplatelet therapy and statins is in line with best practices for secondary prevention in post-MI patients. The patient's history of non-compliance highlights the need for thorough patient education and close follow-up to ensure adherence to the treatment plan.

The case highlights the need for thorough cardiac evaluation in diabetic patients presenting with atypical symptoms, such as gastrointestinal complaints, which may be indicative of an underlying cardiac event. Diabetic patients are prone to silent MIs due to autonomic neuropathy, which can result in a lack of classic chest pain. Therefore, a high index of suspicion is necessary and clinicians should consider cardiac workup even in the absence of typical symptoms.

This case also underscores the complexity of managing STEMI in a patient with multivessel CAD and significant comorbidities. The successful outcome was achieved through timely diagnosis, prompt revascularization and a comprehensive management plan addressing both acute and long-term needs. Silent MI should always be considered in diabetic patients and a high index of suspicion is necessary to avoid delays in treatment.

CONCLUSION

This case highlights the need for thorough cardiac evaluation in patients with uncontrolled diabetes who present with vague symptoms such as vomiting, as these may be indicative of underlying cardiac events. This case also highlights the challenges and successes in managing a high-risk patient with inferior wall STEMI and severe three-vessel CAD. Early diagnosis, prompt PCI and a multidisciplinary approach to ongoing care were crucial in ensuring a favourable outcome.

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