# Challenges and Implication of Atypical Presentation of Acute Myocardial Infarction in Peripheral Sub-Saharan Africa: A Case Report

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## Abstract

This case study presents the clinical course of a 50-year-old female patient with a delayed diagnosis of Acute Myocardial Infarction (AMI) and highlights the challenges in accurately identifying cardiac pathology in patients presenting with atypical symptoms. Patient's initial presentation with non-exertional left-sided chest pain, radiating to the left arm, raising concerns of a cardiac aetiology. At the peripheral center, an initially normal electrocardiogram (ECG) led to an alternative diagnosis of nerve impingement from the cervical spine. Despite further evaluations and interventions, including imaging tests, physiotherapy, and regular follow-up, the patient's symptoms persisted. Eventually, at The Karen Hospital (TKH), an ECG revealed an anterior infarct with septal akinesia on 2D Echo, leading to an accurate diagnosis and successful Percutaneous Coronary Intervention (PCI) to the left anterior descending artery. We aim to shed light on the challenges and implications of delayed suspicion and diagnosis of acute myocardial infarction in sub-Saharan Africa. This case emphasizes the importance of considering AMI as a potential cause of chest pain, even in the absence of typical risk factors, and highlights the significance of timely and accurate diagnosis in improving patient outcomes.

**Key words:** Coronary Artery Disease (CAD), Sub-Saharan Africa (SSA), Percutaneous Coronary Intervention (PCI), Cardiovascular Disease (CVD), Acute Myocardial Infarction (AMI)

## Introduction

Acute Myocardial Infarction (AMI) is a leading cause of mortality worldwide, and its burden is increasing in sub-Saharan Africa (1,2). The timely diagnosis and management of AMI are essential to improve patient outcomes (1). However, delayed suspicion and intervention in sub-Saharan Africa have been identified as major factors contributing to increased morbidity and mortality rates (1,3). The lack of population-based data and standardized diagnostic criteria in the region also poses significant challenges to the development of effective prevention and treatment strategies (3).

Additionally, it is important to consider the presence of sexual disparities in the recognition and presentation of Acute Myocardial Infarction (AMI) symptoms which often leads to delay in intervention. The VIRGO study (Variation in Recovery: Role of Gender on Outcomes of young AMI patients) revealed that young women with AMI experienced longer delays in seeking medical care compared to their male counterparts, highlighting the sex disparity in seeking timely medical attention (2).

We describe a case study of a 50-year-old female patient in Kenya who experienced a delayed diagnosis of acute myocardial infarction due to a lack of suspicion (3). By examining this case, we aim to shed light on the challenges and implications of delayed suspicion and diagnosis of acute myocardial infarction in sub-Saharan Africa especially among women. The factors contributing to the delayed diagnosis of acute myocardial infarction in this context, including potential gaps in medical knowledge, limited resources, differing patterns of risk factors specific to sub-Saharan Africa, and gender disparities in the care of acute chest pain. By addressing these issues, we can enhance awareness, improve diagnostic strategies, and ultimately work towards reducing the burden of coronary artery disease.

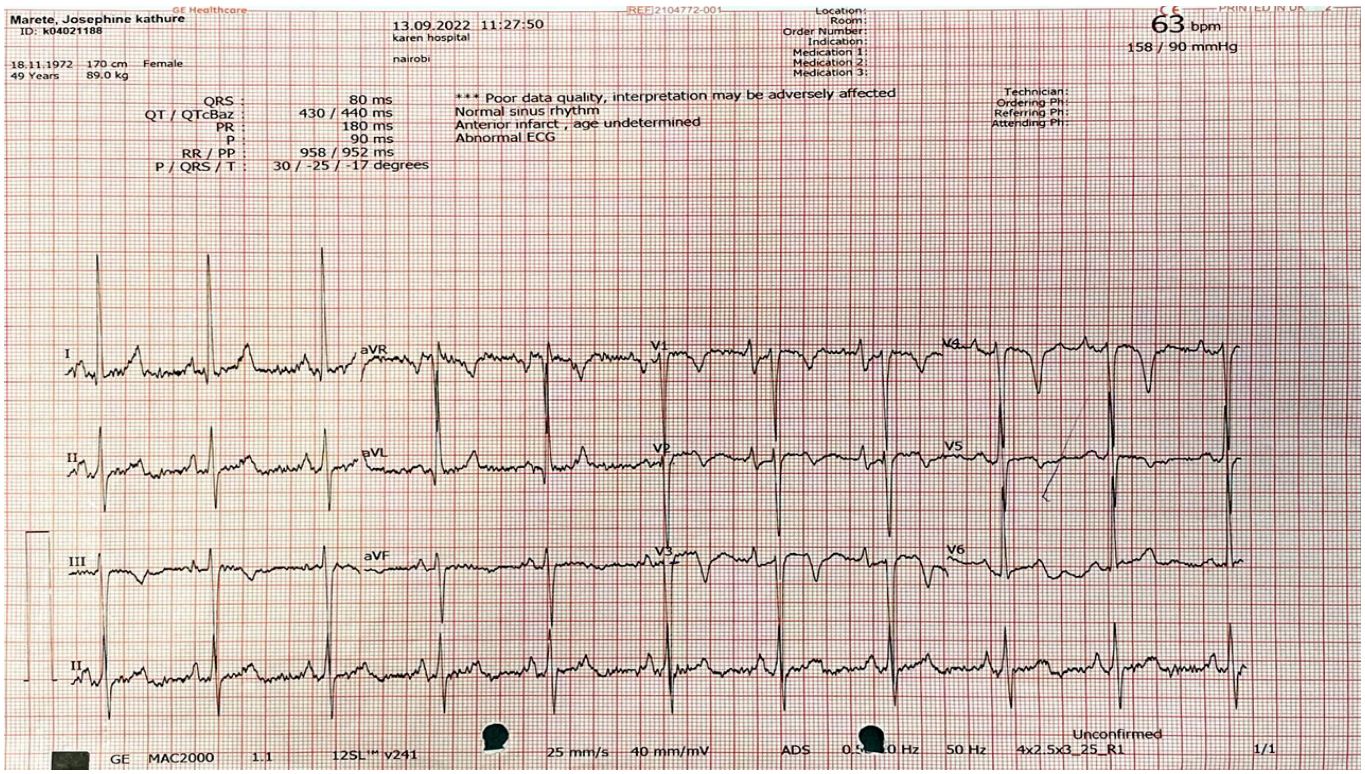
## Case report

A female patient with the only risk factor being hypertension presented to The Karen Hospital with a two-month history of chest pain. She had previously sought medical attention at a peripheral unit where an electrocardiogram (ECG) was performed and reported as normal, with an impression of nerve impingement from the cervical spine as the probable cause was made. Despite prescribed medication and physiotherapy, the patient's symptoms persisted.

The patient consulted another physician who recommended consultation with an orthopaedic specialist. Imaging tests, including an X-ray and MRI of the cervical spine, were conducted and found to be normal. Physiotherapy, comprising twice-weekly sessions and regular skin traction along the cervical spine, was initiated. Despite these interventions, the patient's symptoms persisted with the uncontrolled blood pressure. On visiting The Karen Hospital, Nakuru Branch, she was evaluated further for her symptoms.

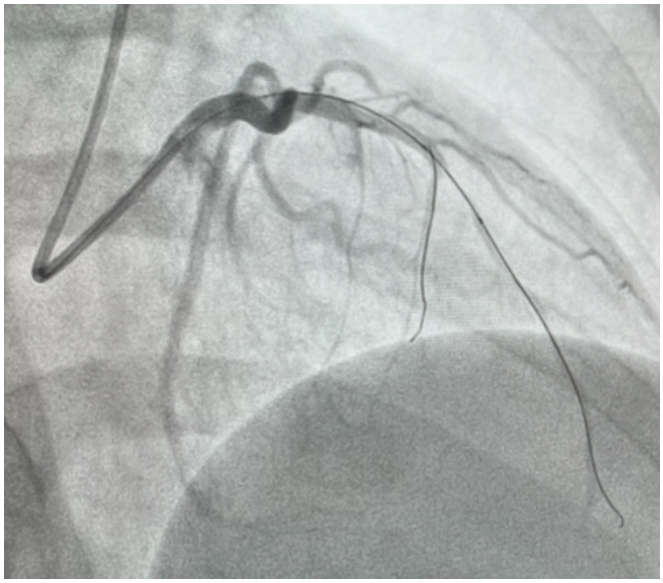
ECG performed at the hospital showed an anterior infarct with ST changes across chest leads V1-V6, LVH.

**Figure 1:** 2-Dimensional echo revealed septal akinesia with normal systolic function and an ejection fraction of 60%. Laboratory tests, including UEC/LFT, CBC, HBA1C, INR, HIV, HBsAg, and HCV were within normal limits




She was taken to Cath lab immediately where an angiogram was done and revealed, normal left main coronary artery.

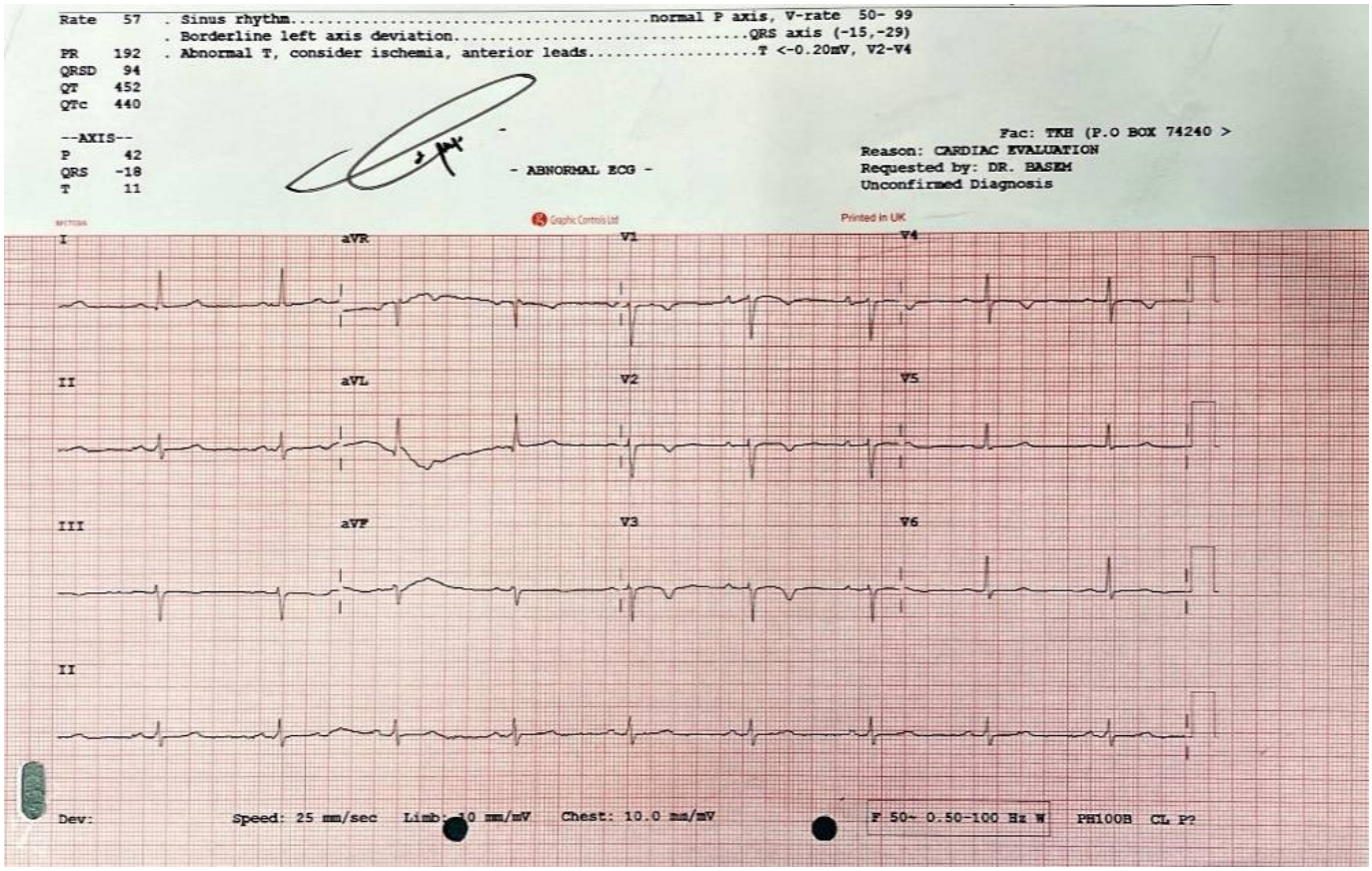
**Figure 2:** Right coronary artery (dominant), normal circumflex coronary artery, and a 95% stenosis of the left anterior descending artery



Coronary angiogram was advised for the ongoing symptoms and the ECG findings. Angioplasty was done as the patient had significant block of left anterior descending artery.

**Figure 3:** After PCI intervention to LAD lesion

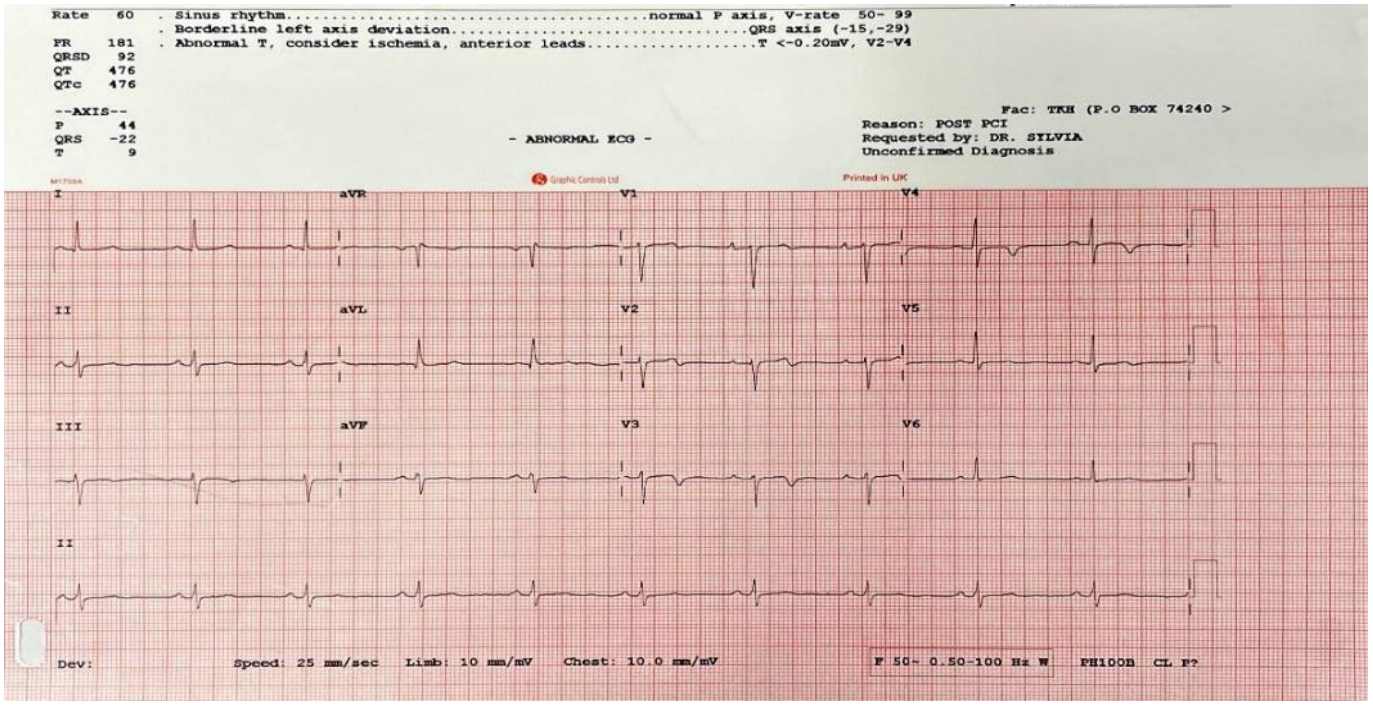
**Figure 4:** Post-procedure had normal voltage ECG due to coronary flow restoration




Following the PCI, the patient was observed at the High Dependency Unit and subsequently transferred to the ward. After one day, she was discharged with prescribed medication, including Imdur (Isosorbide mononitrate) 10mg BD, Concor (bisoprolol) 5mg OD, Atorvastatin 80mg OD, and Prasugrel 10mg OD. Regular follow-up appointments were scheduled to monitor her progress.

She is currently doing well, does not experience any chest pain, continues with cardiac rehabilitation, and is compliant with medication and regular check of blood pressure, ECG and echo cardiogram.

**Figure 5:** 3rd ECG – 22.09.22 11 AM – during follow up



## Discussion

This case study raises concerns about the importance of recognizing atypical symptoms and considering the possibility of cardiac involvement, even in patients without typical risk factors. It also highlights the challenges of limited resources and gaps in medical knowledge in the region. The patient's initial misdiagnosis and delayed management of myocardial infarction.

Sub-Saharan Africa has a high burden of Cardiovascular Disease (CVD), including AMI, which is rising and is expected to continue rising in the coming years (4). However, the region faces several challenges in the diagnosis and management of AMI, including limited resources, inadequate infrastructure, and a shortage of trained healthcare professionals (5).

Diagnosis of AMI in sub-Saharan Africa is often based on clinical presentation, which may not always be typical or easily recognizable. The use of diagnostic tools such as electrocardiography (ECG) and echocardiography plays a crucial role in the diagnosis and management of AMI. However, the availability and accessibility of these tools are limited in sub-Saharan Africa, particularly in rural areas (6). This often results in delayed diagnosis and management of AMI, which can lead to poor outcomes for patients.

Moreover, substantial differences in care have been observed across the spectrum of acute chest pain management, including prehospital care and hospital management. A report by the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines showed that women are less likely to receive guideline-directed care measures such as transport to the hospital, pre-hospital aspirin or analgesia administration, and timely off-load from emergency medical services. (7,8). The case study highlights the importance of timely intervention with Percutaneous Coronary Intervention (PCI) in the management of AMI, which resulted in successful revascularization and improved outcomes for the patient. However, the availability and accessibility of PCI are also limited in sub-Saharan Africa, particularly in rural areas. It also sheds light on the disparities in access to appropriate care and highlight the need for interventions to address these discrepancies in order to improve outcomes for patients.

## Conclusions

The case study emphasizes the need for a coordinated effort to improve diagnostic and management strategies for AMI in sub-Saharan Africa. This includes increasing awareness and education among healthcare professionals on atypical presentations of AMI, improving the availability and accessibility of diagnostic tools such as ECG and echocardiography, and increasing access to PCI. Addressing these challenges will require a multi-faceted approach involving healthcare providers, policymakers, and other stakeholders to improve CVD outcomes in sub-Saharan Africa.

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