IMJ Official Journal of the Irish Medical Organisation

Ir Med J; October 2023; Vol 116; No. 9; P862
19th October, 2023

# Transient ST-elevation MI diagnosed by Holter monitoring

N. Hussaini[1,2], C. Lane[3], R. Ahmad[4], N. Hussaini[5], A. Hussaini[2,6]

1. University Hospital Lewisham, Lewisham High St, UK.
2. Lifeline Cardiology Clinic, Roxboro Road, Limerick, Ireland.
3. Peel Health Campus, 110 Lakes Road, Mandurah, Australia.
4. St James's Hospital, James Street, Dublin 8, Ireland.
5. School of Medicine, University of Manchester, UK.
6. Mater Private Cork, City Gate, Mahon, Cork, Ireland.

**Abstract**

*Presentation*
A 54-year-old woman was referred with an 8-week history of pressure sensations over the chest and epigastrium unrelated to exertion. She presented to the Emergency Department 4 weeks prior but self-discharged against medical advice due to the long wait time.

*Diagnosis*
ECG revealed T wave inversion in leads III & aVF, and transthoracic echocardiogram showed normal ventricular systolic function. A 24-hour Holter monitor was performed due to cardiac risk factors to investigate for arrhythmias. Results revealed episodes of ST elevation which correlated with the patient's recorded events. Coronary angiography demonstrated 99% stenosis in the right coronary artery.

*Treatment*
Percutaneous coronary intervention was performed and the patient was started on dual-antiplatelet therapy, statin, and betablocker. Anginal episodes resolved immediately.

*Discussion*
ST changes on Holter readings may be of diagnostic benefit and warrant further assessment.

## Introduction

Acute myocardial infarction is diagnosed with the rise or fall of cardiac biomarkers and 1 of the following: symptoms of myocardial ischaemia; ischaemic ECG changes; development of pathological Q waves; imaging evidence of infarcted myocardium; coronary thrombus identified on angiography.[1] Due to its acute nature, it is rarely seen on ambulatory

electrocardiographic monitoring during the work-up of episodic chest pain. We report a case of unstable angina/spontaneously reperfused ST elevation MI (STEMI) associated with transient ST-elevation diagnosed by Holter monitoring.

**Case Report**

A 54-year-old female presented with "new indigestion-type symptoms". She had attended the Emergency Department 4 weeks previously for these symptoms, from which she self-discharged against medical advice.

She reported an 8-week history of recurrent, episodic chest pain at rest, unrelated to exertion. The pain was described as a "pressure-like sensation" over the central chest and epigastric areas and occurred on most days. Onset was primarily nocturnal and woke her from sleep, with the duration of pain ranging from minutes-to-hours. There was no associated dyspnoea, palpitations, orthopnoea, or paroxysmal nocturnal dyspnoea. She rated the pain as 6/10 at the beginning of the episode which quickly progressed to 10/10.

Her medical history depicted hypertension, hyperlipidaemia, and borderline raised BMI. Her family history included ischaemic heart disease, with her mother suffering from a myocardial infarction at the age of 49. She has an 18 pack-year smoking history.

Examination revealed blood pressure of 186/106mmHg. Heart rate was normal at 83bpm. Initial ECG showed T wave inversion in lead III and AVF. There was no evidence of acute ST elevation. Transthoracic echocardiogram showed good left ventricular systolic function of 55%. There was evidence of mild left ventricular hypertrophy, mildly-thickened anterior mitral valve, and mild mitral regurgitation.

The initial diagnosis was atypical chest pain with a likely gastric aetiology. However, due to risk factors, a 24-hour Holter monitor investigating evidence of chest pain-associated arrhythmias was conducted, and revealed 2 transient episodes of ST elevation which correlated with the patient's recorded chest pain events [Fig. 1].

The recording prompted urgent angiogram, which showed a critical 99% stenosis in the mid-Right Coronary Artery due to chronic plaque [Fig. 2]. The Left Anterior Descending Artery also showed 30% diffuse disease. A differential diagnosis of spontaneously recanalised ST-elevation myocardial infarction with stuttering ischaemia was made.

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Percutaneous coronary intervention was performed, with balloon angioplasty and stenting of the stenosed area [Fig. 2]. Anginal episodes resolved immediately. Patient was started on dual-antiplatelet therapy, statin, and beta blocker.

The patient was re-examined three months post-intervention, reporting no recurrence of symptoms.

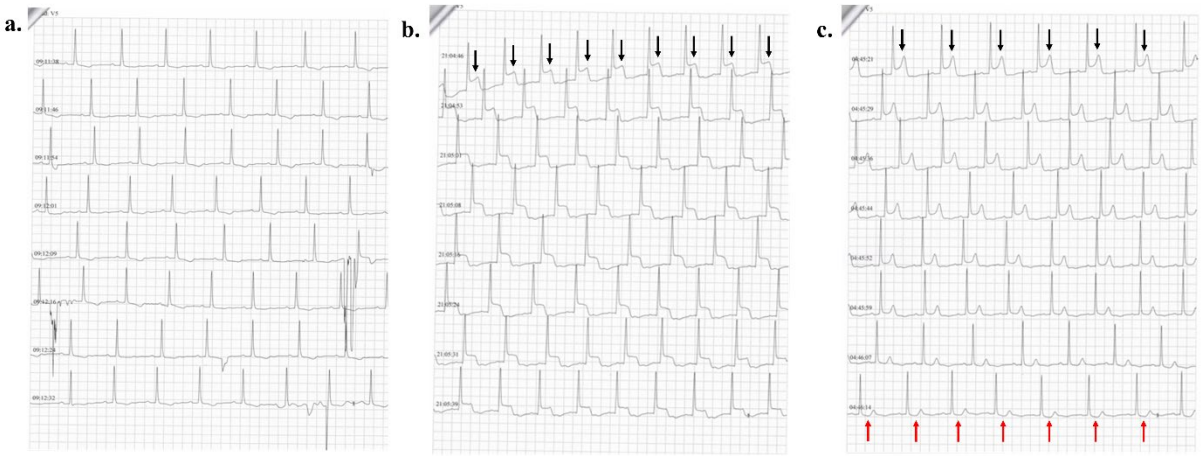


***Figure 1*** *– Holter monitor recordings.*
*a) Normal recording*
*b) First episode of recorded chest pain with corresponding ST elevation highlighted with black arrows c) Second episode of recorded chest pain with corresponding ST elevation highlighted with black arrows. Complete resolution of ST elevation is also seen towards the end of this recording as highlighted by the red arrows.*

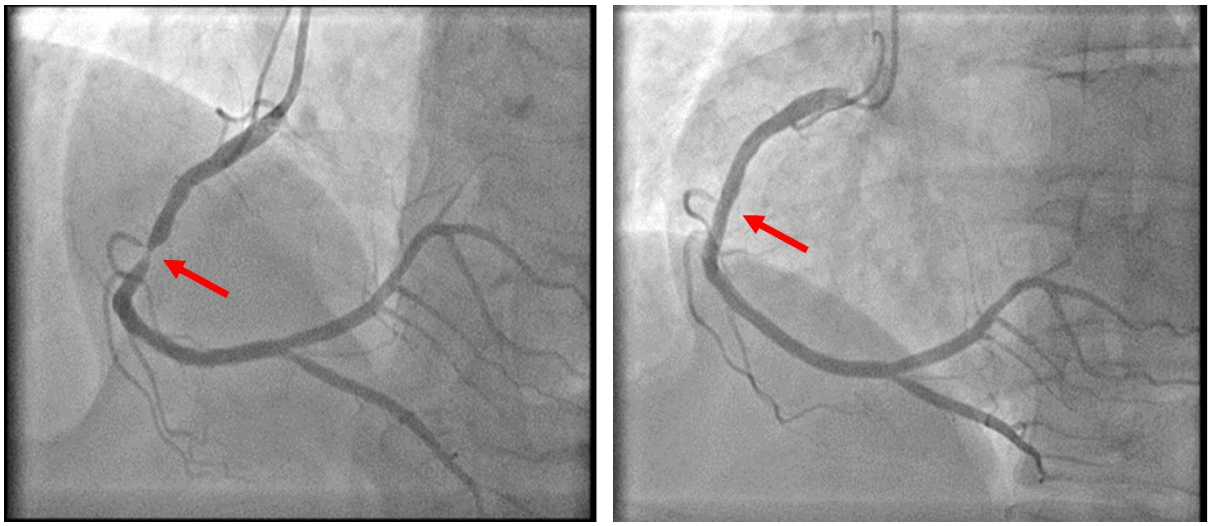

***Figure 2*** *– Fluoroscopy with contrast of RCA with red arrow highlighting stenosis, before PCI (left panel) and after PCI (right panel).*

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**Discussion**

In this case of atypical chest pain with stuttering ischaemia, suspicion of acute coronary syndrome was low. Due to risk factors, a 24-hour Holter monitor was organised to investigate other cardiac causes. Exercise tests may have revealed the aetiology, though given the critical underlying ischemia, may have resulted in an acute arrhythmic event. The episodes of ST elevation in accordance with patient-reported chest pain indicated critical ischaemia, confirmed by coronary angiogram.
Identification of ST elevation on this Holter monitor proved vital for the positive outcome. It provides important learning in similar cases, where cardiac causes of chest pain are prematurely dismissed due to near-normal investigations.

Presentations of recurrent episodes of atypical chest pain should consider ischaemia-testing if patients are deemed high-risk. In rare cases, ST changes on Holter monitoring may be of diagnostic benefit and should not be dismissed without further assessment.

**Declaration of Conflicts of Interest:**

None declared.

**Corresponding Author**
Naayema Hussaini
University Hospital Lewisham,
Lewisham High St,
London SE13 6LH,
UK.
E-Mail: nahussai@tcd.ie

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