International Journal of Emergency Medicine

CASE REPORT Open Access

Posterior STEMI presenting as painless, isolated left arm numbness and weakness: a case report

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Abstract

This case describes an atypical presentation of isolated posterior ST-segment elevation myocardial infarction (STEMI), who presented with left arm numbness and weakness, mimicking an acute stroke. Diagnosis was confirmed with coronary angiogram showing occlusion in proximal left circumflex artery, as well as rise in troponin. This atypical presentation highlights the importance of maintaining high index of suspicion and casting a wide net of differential diagnoses in initial assessment of patient in the emergency department.

Background

ST-segment elevation myocardial infarction (STEMI) is a medical emergency caused by complete occlusion of one or more coronary arteries [1]. This life-threatening condition needs to be diagnosed in a timely manner, as international guidelines recommend door-to-balloon interval of less than 90 min [2]. Diagnosis of STEMI hinges on recognizing electrocardiogram (ECG) finding of ST-segment elevation. However, STEMI often present atypically, presenting challenges to Emergency Physicians. Atypical pain was defined as "epigastric or back pain, or pain that was described as burning, stabbing, characteristic of indigestion, or other" [3]. This also includes pain or discomfort in areas of the upper body other than the chest, which includes arms [4]. A study from a German myocardial infarction registry found that 57.7% of STEMI cases presented with pain in the left shoulder/arm/hand [5]. However, arm numbness or weakness has not been reported to be typically associated with STEMI. Additionally, isolated posterior STEMI is a rare entity, with incidence of approximately 3.3%, and is frequently missed [6]. In this case report, we present a case of posterior STEMI whose presentation mimicked an acute stroke.

Case

A 48-year-old previously well Chinese male presented to the emergency department with sudden onset of left upper limb numbness and weakness starting around 3 hours before presentation, with no chest pain. His vital signs were stable, with temperature of 36.9 °C, heart rate of 63 beats per minute, blood pressure of 135/80 mmHg, respiratory rate of 16 breaths per minute, and oxygen saturations of 100% on room air. On examination, he was alert and comfortable. His heart sounds were dual, and lungs were clear. On neurological examination, there was no obvious difference in power with MRC 5 bilaterally, with slight numbness over left upper limb.

In view of initial suspicion of a pure sensory stroke, Computed Tomography (CT) scans of the brain and four-vessel angiography were performed, which showed no obvious dissection, flap or aneurysm.

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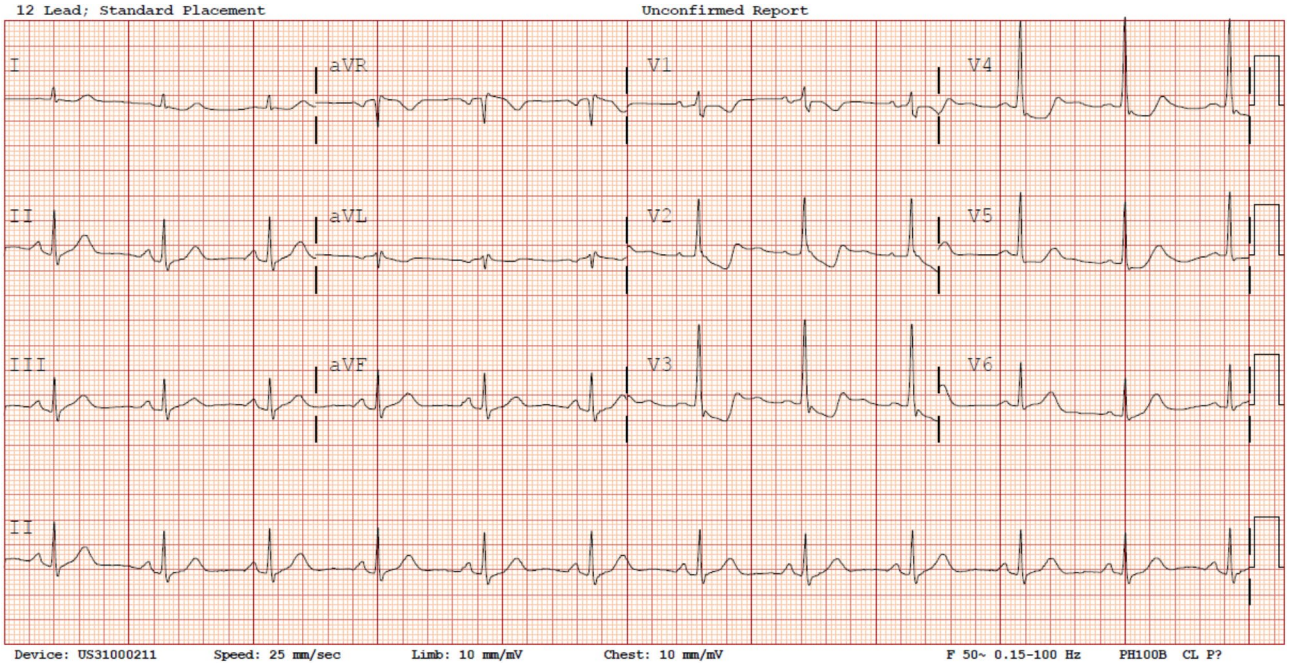

Fig. 1 Initial ECG tracing

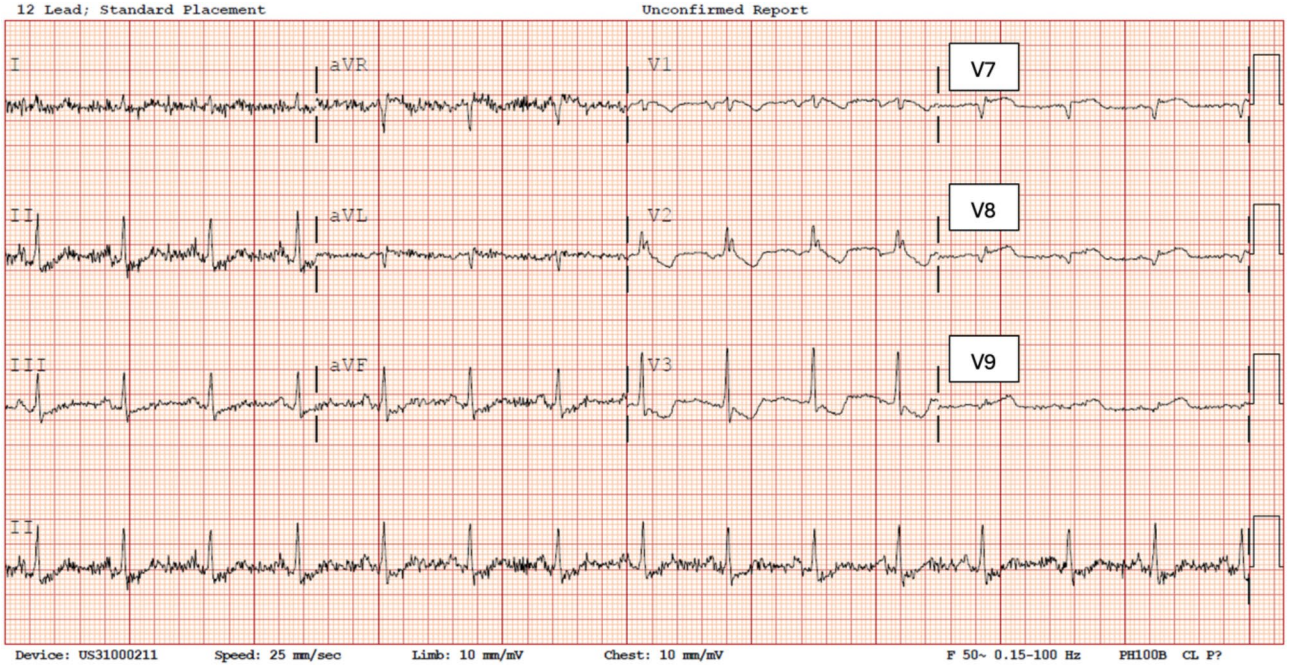

Fig. 2 Posterior ECG tracing

As part of workup, ECG was also performed. ECG showed normal sinus rhythm with ST depressions and T inversions in V2-V5 (Fig. 1). Automated machine reading of the ECG was acute myocardial infarction (MI).

In view of finding on initial ECG, posterior ECG was done. Posterior ECG showed ST elevations in V7-9 (Fig. 2).

Diagnosis of posterior STEMI was made, and Cardiac Catheterization Lab was activated. Patient was given aspirin 300 mg and ticagrelor 180 mg. Patient underwent coronary angiogram, which revealed single vessel coronary artery disease in proximal left circumflex artery with 100% obstruction. Percutaneous coronary intervention was performed and a stent was deployed. Troponin level at presentation was 12.6 ng/L, which rose to 8518 ng/L

after 4 h. Physiotherapy review while inpatient showed equal power in bilateral upper and lower limbs. Patient was discharged well with no in-hospital complications, with nil remnant symptoms, and was noted to be well at follow-up with the cardiac rehabilitation clinic.

Discussion

To our knowledge, this is the first case report that documents left arm numbness and subjective weakness as a presenting complaint for isolated posterior STEMI. Numbness in the arms, generalized weakness and left arm pain are known associated symptoms of myocardial infarction [7], while isolated left arm weakness is unique. In this case, initial differential diagnoses include acute sensory stroke or aortic dissection, which was promptly excluded with normal CT brain and 4-vessel angiography.

Atypical presentations of STEMI are variable, with chest pain or no chest pain. A systematic review of case reports showed that most atypical MI occur in patients at age > 50 years, with comorbidities such as diabetes, hypertension, and hyperlipidemia [8]. Our patient was unique as he had no known comorbidities and is not of the age range previously reported.

The additional challenge in this case was prompt recognition of the ECG changes of posterior STEMI. In this case, as the treating team was focused on investigating for cerebrovascular accident, the ECG recognition was delayed, with the posterior ECG taken 30 min after the initial ECG, despite machine reading of acute MI. During initial workup of the undifferentiated patient, care must be taken to maintain a broad differential diagnosis and to follow up on investigations ordered promptly. Additionally, further education and/or change in workflow may be required to ensure that the staff performing investigations alert emergency physicians of concerning machine reading such as this ECG tracing.

Majority of posterior STEMI happen together with inferior or lateral STEMI, which trigger clinicians to look for posterior changes. Isolated posterior STEMI remains underrecognized, as there are no obvious ST elevations in the standard 12-lead ECG. In posterior STEMI, attention must be paid to look for reciprocal changes in anteroseptal leads V1-3. Following initial suspicion, inclusion of lead V7, V8, and V9 increases diagnostic accuracy in posterior STEMI [9]. Of note, the threshold value for ST elevation in V7-9 is 0.5 mm [10].

In addition, other than posterior STEMI, ST depressions in anteroseptal leads V1-3 may also be caused by other non-ischemic causes such as left ventricular hypertrophy, left bundle branch block, or digoxin use [11]. Also, ECG abnormalities can often be found in stroke, such as T-wave abnormalities, prolonged QTc, Q waves, ST elevation and ST depression [12]. This adds to the challenge faced by the emergency physician in recognizing posterior STEMI promptly in this case.

Conclusion

Posterior STEMI ECG changes are less commonly seen and easier to miss, requiring emergency physician to maintain a high index of suspicion to make a timely diagnosis and ensure a good outcome. In situation of suspected acute stroke, an ECG should still be performed and reviewed at the earliest opportunity to avoid missing an atypical presentation of a STEMI.

Author contributions

The authors confirm contribution to the paper as follows: Study conception and design: MY; analysis and discussion: ADUR and MY; draft manuscript preparation: ADUR and MY. All authors reviewed and approved the final version of the manuscript.

Funding

Nil.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

The patient provided written informed consent for publication of this case report. A copy of the written consent is available on reasonable request.

Competing interests

The authors declare no competing interests.

Received: 10 December 2024 / Accepted: 22 February 2025
Published online: 06 March 2025

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