JHWCR JOURNAL OF HEALTH, WELLNESS AND COMMUNITY RESEARCH 3007-0570

DOI: https://doi.org/10.61919/8hdhxx58

Original Article

Frequency of Isolated Posterior Wall Myocardial Infarction in Patients Presenting with ST-Elevation Myocardial Infarction

Dr. Wajib Ullah[1], Dr. Muhammad Adil[1], Dr. Qazi Tauseef Ahmad[1], Dr. Shah Fahad Ullah[1], Dr. Muhammad Zohaib[1]

[1] Department of Cardiology, Lady Reading Hospital MTI, Peshawar, Pakistan

*Corresponding author: Dr. Muhammad Adil, dradil2003@gmail.com

"Cite this Article" **Received**: 18 April 2025; **Accepted**: 30 May 2025; **Published**: 30 June 2025
Author Contributions: Concept: WU, MA; Design: WU, MA, QTA; Data Collection: WU, SFU, MZ; Analysis: MA, QTA; Drafting: WU, MA, SFU, MZ. **Ethical Approval**Lady Reading Hospital MTI, Peshawar, Pakistan. **Informed Consent**: Written informed consent was obtained from all participants; **Conflict of Interest**: The authors declare no conflict of interest. **Funding**: No external funding; **Data Availability**: Available from the corresponding author on reasonable request; **Acknowledgments**: NA

ABSTRACT

Background: Isolated posterior-wall myocardial infarction may be overlooked on a standard 12-lead electrocardiogram because it commonly produces reciprocal anterior changes rather than direct ST-segment elevation. Objective: To determine the frequency of isolated posterior-wall myocardial infarction among patients presenting with ST-elevation myocardial infarction. Methods: This hospital-based cross-sectional study included 120 patients presenting with ST-elevation myocardial infarction at the Department of Cardiology, Lady Reading Hospital, Peshawar, from 13 January 2025 to 13 April 2025. Standard 12-lead electrocardiography and posterior leads V7–V9 were used to identify reciprocal ST-segment depression in V1–V3 and direct posterior ST-segment elevation. Categorical variables were summarized as frequencies and percentages, and exploratory subgroup comparisons were performed using Fisher's exact test. Results: Isolated posterior-wall myocardial infarction was identified in 6 of 120 patients, giving a frequency of 5.0% (95% CI: 2.3%–10.5%). The sample included 79 men (65.8%), and 75 participants (62.5%) were older than 50 years. No statistically significant associations were found with age, sex, body mass index, socioeconomic status, education, residence, or occupational status. Conclusion: Isolated posterior-wall myocardial infarction occurred in a small but clinically relevant proportion of patients presenting with ST-elevation myocardial infarction. Posterior leads may support timely diagnosis when reciprocal anterior changes raise suspicion of posterior involvement. Keywords: Electrocardiography; myocardial infarction; posterior wall; ST-elevation myocardial infarction; posterior leads.

INTRODUCTION

Acute myocardial infarction remains a major cause of cardiovascular morbidity and mortality worldwide. It most commonly results from disruption of an atherosclerotic coronary plaque followed by thrombus formation and acute reduction or interruption of myocardial blood flow (1,2). ST-elevation myocardial infarction (STEMI) is a time-sensitive clinical emergency characterized by symptoms of acute myocardial ischemia accompanied by diagnostic electrocardiographic changes. Prompt recognition and reperfusion are essential to limit myocardial injury, preserve ventricular function, and reduce the risk of complications and death (3–5).

STEMI may be classified according to the anatomical myocardial territory involved, including anterior, inferior, lateral, septal, and posterior regions. The clinical manifestations, electrocardiographic findings, culprit coronary artery, extent of myocardial injury, and associated complications may vary according to the infarct location (5,6). Posterior-wall myocardial infarction is particularly important because its characteristic changes may not be directly visible on a conventional 12-lead electrocardiogram. The

ISSN 3007-0570

posterior myocardial wall is usually supplied by the posterior descending artery, which most commonly arises from the right coronary artery but may originate from the left circumflex artery in a left-dominant coronary circulation (9,12).

In isolated posterior-wall myocardial infarction, the standard 12-lead electrocardiogram may demonstrate reciprocal changes rather than direct ST-segment elevation. These changes commonly include horizontal ST-segment depression, prominent R waves, and upright T waves in leads V1–V3, which may be misinterpreted as anterior ischemia or non-ST-elevation acute coronary syndrome (8–11). Recording additional posterior leads V7–V9 can demonstrate direct ST-segment elevation over the posterior myocardium and improve diagnostic recognition, particularly when reciprocal anterior changes are present (9–12). Failure to identify this pattern may delay reperfusion therapy and expose patients to avoidable myocardial injury and adverse clinical outcomes (9–11).

Previous studies have reported varying frequencies of posterior myocardial infarction, partly because of differences in study populations, diagnostic definitions, denominators, and the routine use of posterior electrocardiographic leads. Studies relying exclusively on standard 12-lead electrocardiography may underestimate posterior-wall involvement, whereas systematic use of leads V7–V9 may improve case detection (13,14). Evidence regarding the frequency of isolated posterior-wall myocardial infarction among patients presenting with STEMI remains limited in local tertiary-care settings. Establishing its frequency may support greater clinical awareness and encourage timely use of posterior leads in patients with suspicious reciprocal electrocardiographic changes. Therefore, this study aimed to determine the frequency of isolated posterior-wall myocardial infarction among patients presenting with STEMI at the Department of Cardiology, Lady Reading Hospital, Peshawar.

MATERIALS AND METHODS

A hospital-based cross-sectional study was conducted in the Department of Cardiology, Lady Reading Hospital, Medical Teaching Institution, Peshawar, from 13 January 2025 to 13 April 2025. The study population comprised patients presenting to the department with ST-elevation myocardial infarction. A total of 120 participants were enrolled following approval of the study protocol. The sample size was determined using World Health Organization sample-size software at a 95% confidence level and 8% absolute precision, based on the anticipated proportion specified in the approved study protocol. Patients were recruited from the eligible population presenting during the study period.

Men and women aged 18–60 years presenting with STEMI were considered eligible for inclusion. STEMI was identified on the basis of a clinical presentation compatible with acute myocardial ischemia, diagnostic ST-segment elevation in contiguous electrocardiographic leads, and elevated cardiac troponin T. The electrocardiographic criterion comprised ST-segment elevation of at least 1 mm in two contiguous limb leads or at least 2 mm in contiguous precordial leads. Patients with a previous myocardial infarction, known cardiomyopathy or structural heart disease, advanced renal impairment defined by an estimated glomerular filtration rate below 30 mL/min/1.73 m², or hemodynamic instability due to cardiogenic shock were excluded.

The study was initiated after obtaining approval from the institutional review board. Eligible patients received an explanation of the study purpose and procedures, and written informed consent was obtained without interfering with or delaying emergency clinical management. Participant confidentiality was maintained throughout data collection and analysis, and identifying information was not included in the analytical dataset.

Demographic and clinical information was collected through clinical history, physical examination, medical records, and a structured study proforma. Recorded variables included age, sex, body mass index, duration of presenting complaint, socioeconomic status, educational status, residence, and occupational status. Body mass index was calculated as body weight in kilograms divided by height in metres squared. The duration of complaint was recorded in hours from symptom onset to presentation.

All enrolled patients underwent standard 12-lead electrocardiography. Additional posterior leads V7, V8, and V9 were recorded to evaluate direct posterior-wall ST-segment changes. Posterior leads were positioned over the left posterior thorax at the same horizontal level as lead V6: V7 at the posterior axillary line, V8 at the midscapular line, and V9 at the left paraspinal region. The electrocardiographic assessment focused on reciprocal ST-segment depression in the anterior precordial leads V1–V3 and direct ST-segment elevation in the posterior leads.

Isolated posterior-wall myocardial infarction was operationally defined as a clinical presentation consistent with acute myocardial infarction accompanied by reciprocal ST-segment depression in leads V1–V3 and ST-segment elevation of at least 0.5 mm in posterior leads V7–V9, without a diagnostic ST-elevation pattern indicating concomitant anterior, inferior, or lateral-wall infarction. Cases fulfilling these criteria were classified as isolated posterior-wall myocardial infarction and recorded on the structured proforma.

The collected data were analysed using IBM SPSS Statistics version 30.0. Data completeness and consistency were checked before analysis. The distribution of continuous variables was assessed using the Shapiro–Wilk test. Normally distributed continuous variables were summarized as mean ± standard deviation, whereas skewed variables were summarized as median and interquartile range. Categorical variables were reported as frequencies and percentages. The frequency of isolated posterior-wall myocardial infarction was calculated by dividing the number of confirmed cases by the total number of enrolled patients and expressing the result as a percentage.

Exploratory subgroup analyses were performed by stratifying isolated posterior-wall myocardial infarction according to age group, sex, body mass index category, socioeconomic status, educational level, residence, and occupational status. Associations between categorical variables and isolated posterior-wall myocardial infarction were evaluated using Fisher's exact test because of the small number of outcome events and sparse expected cell counts. All tests were two-sided, and a p-value of ≤ 0.05 was considered statistically significant. Given the limited number of isolated posterior-wall myocardial infarction cases, subgroup analyses were regarded as exploratory rather than confirmatory.

RESULTS

A total of 120 patients presenting with ST-elevation myocardial infarction were included in the analysis. Seventy-five participants (62.5%) were older than 50 years, and 79 (65.8%) were male. The mean body mass index was 22.83 ± 3.25 kg/m^2, with 100 participants (83.3%) having a body mass index of ≤ 25 kg/m^2. The reported mean duration of complaint before presentation was 7.46 ± 10.52 hours. Most participants had no formal education (70.0%), 56.7% belonged to the middle socioeconomic category, 52.5% lived in urban areas, and 76.7% were classified as not employed (Table I).

Isolated posterior-wall myocardial infarction was identified in 6 of the 120 participants, corresponding to a frequency of 5.0% with a 95% confidence interval of 2.3%–10.5%. The remaining 114 participants (95.0%) did not meet the electrocardiographic criteria for isolated posterior-wall myocardial infarction (Table II).

The frequency of isolated posterior-wall myocardial infarction was 4.4% among participants aged ≤ 50 years and 5.3% among those aged >50 years. It was observed in 6.3% of male participants and 2.4% of female participants. The frequency was identical in participants with a body mass index of ≤ 25 kg/m^2 and those with a body mass index of >25 kg/m^2, at 5.0% in each category.

Table I. Demographic and Clinical Characteristics of Participants (n=120)

Variable	Category	Value
Age group, years	≤50	45 (37.5)
	>50	75 (62.5)
Sex	Male	79 (65.8)
	Female	41 (34.2)
Body mass index, kg/m²	Mean ± SD	22.83 ± 3.25
Body mass index category	≤25 kg/m²	100 (83.3)
	>25 kg/m²	20 (16.7)
Duration of complaint, hours	Mean ± SD	7.46 ± 10.52
Socioeconomic status	Low	52 (43.3)
	Middle	68 (56.7)
Educational status	No formal education	84 (70.0)
	Primary	12 (10.0)
	Secondary	22 (18.3)
	Higher education	2 (1.7)
Residence	Rural	57 (47.5)
	Urban	63 (52.5)
Occupational status	Not employed	92 (76.7)
	Employed	17 (14.2)
	Business/self-employed	11 (9.2)

Values are presented as n (%) unless otherwise indicated. SD: standard deviation.

Table II. Frequency of Isolated Posterior-Wall Myocardial Infarction Among Patients Presenting With STEMI

Isolated posterior-wall myocardial infarction	n	Percentage	95% CI
Present	6	5.0	2.3–10.5
Absent	114	95.0	—
Total	120	100.0	—

CI: confidence interval; STEMI: ST-elevation myocardial infarction. The 95% confidence interval for the primary proportion was calculated using the Wilson method.

Table III. Frequency of Isolated Posterior-Wall Myocardial Infarction According to Participant Characteristics

Variable	Category	Total, n	Posterior-wall MI, n (%)	No posterior-wall MI, n (%)	p-value
Age group, years	≤50	45	2 (4.4)	43 (95.6)	1.000
	>50	75	4 (5.3)	71 (94.7)	
Sex	Male	79	5 (6.3)	74 (93.7)	0.432
	Female	41	1 (2.4)	40 (97.6)	
Body mass index	≤25 kg/m²	100	5 (5.0)	95 (95.0)	1.000
	>25 kg/m²	20	1 (5.0)	19 (95.0)	
Socioeconomic status	Low	52	1 (1.9)	51 (98.1)	0.232
	Middle	68	5 (7.4)	63 (92.6)	
Educational status	No formal education	84	5 (6.0)	79 (94.0)	0.480
	Primary	12	1 (8.3)	11 (91.7)	
	Secondary	22	0 (0.0)	22 (100.0)	
	Higher education	2	0 (0.0)	2 (100.0)	
Residence	Rural	57	3 (5.3)	54 (94.7)	1.000
	Urban	63	3 (4.8)	60 (95.2)	
Occupational status	Not employed	92	5 (5.4)	87 (94.6)	0.857
	Employed	17	1 (5.9)	16 (94.1)	
	Business/self-employed	11	0 (0.0)	11 (100.0)	

A higher numerical frequency was observed among participants in the middle socioeconomic category than among those in the low socioeconomic category, at 7.4% and 1.9%, respectively. Isolated posterior-wall myocardial infarction was identified in 6.0% of participants with no formal education and 8.3% of those with primary education, whereas no cases were observed among participants with secondary or higher education. Frequencies were similar among rural and urban residents, at 5.3% and 4.8%, respectively.

None of the examined demographic or socioeconomic characteristics demonstrated a statistically significant association with isolated posterior-wall myocardial infarction. The corresponding p-values were 1.000 for age group, 0.432 for sex, 1.000 for body mass index category, 0.232 for socioeconomic status, 0.480 for educational status, 1.000 for residence, and 0.857 for occupational status. Because only six outcome events occurred, these subgroup comparisons were exploratory and did not provide sufficient evidence to establish or exclude demographic predictors of isolated posterior-wall myocardial infarction (Table III).

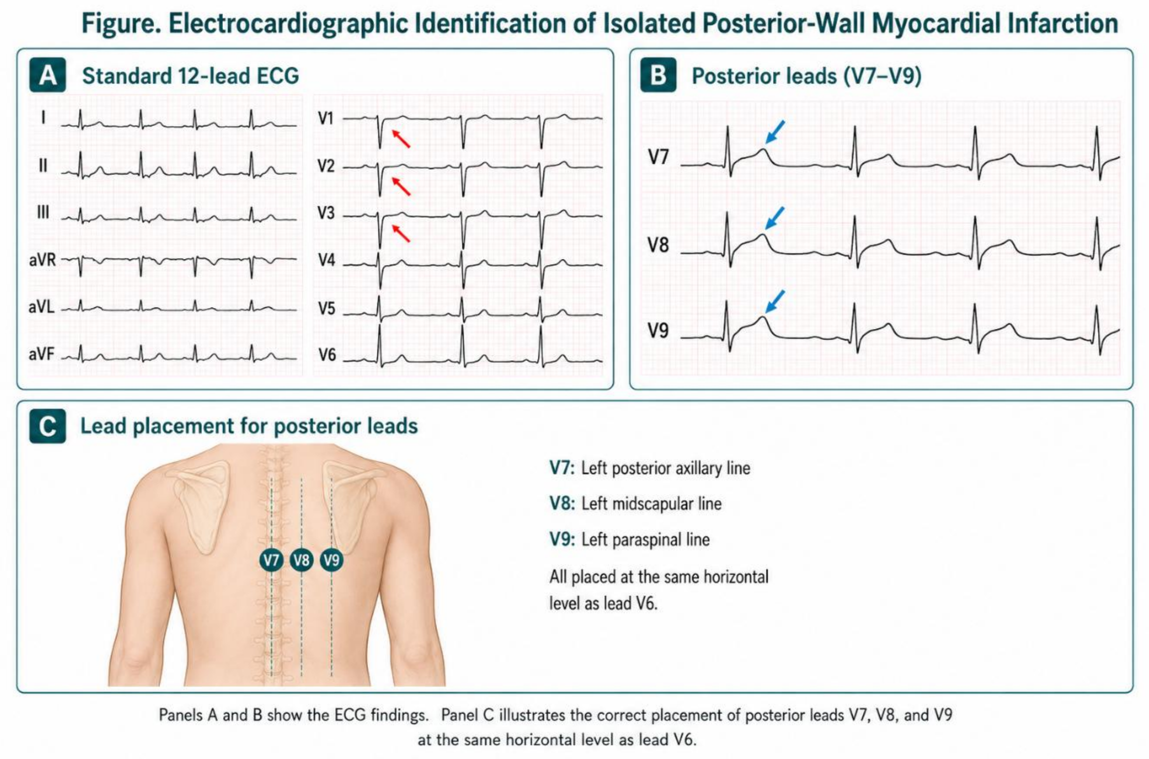

Figure 1 illustrates the electrocardiographic identification of isolated posterior-wall myocardial infarction by showing reciprocal ST-segment depression in leads V1–V3 on the standard 12-lead ECG, corresponding ST-segment elevation in posterior leads V7–V9, and the correct anatomical placement of V7 at the left posterior axillary line, V8 at the left midscapular line, and V9 at the left paraspinal line, all at the same horizontal level as V6.

DISCUSSION

This study determined the frequency of isolated posterior-wall myocardial infarction among patients presenting with ST-elevation myocardial infarction at a tertiary-care cardiology centre. Isolated posterior-wall myocardial infarction was identified in 6 of 120 patients, corresponding to a frequency of 5.0% with a 95% confidence interval of 2.3%–10.5%. No statistically significant associations were observed between isolated posterior-wall myocardial infarction and the examined demographic or socioeconomic characteristics. However, the small number of outcome events limited the precision and statistical power of these subgroup comparisons.

The observed frequency was similar to that reported by Din et al., who documented posterior myocardial infarction in 5.68% of patients with acute coronary syndrome when posterior electrocardiographic leads were used as part of the diagnostic assessment (14). Kumar and Durdana reported a lower frequency of posterior myocardial infarction among patients with STEMI, which may reflect differences in study population, diagnostic definitions, and the extent to which posterior leads were routinely recorded (15). Comparisons between studies should nevertheless be interpreted cautiously because some investigations included all acute coronary syndromes, whereas others were restricted to STEMI or selected patients with suspected posterior involvement.

Posterior-wall myocardial infarction remains diagnostically challenging because the posterior surface of the heart is not directly represented by the standard 12-lead electrocardiogram. Reciprocal ST-segment depression in leads V1–V3, particularly when accompanied by prominent R waves and upright T waves, may represent a posterior injury pattern rather than isolated anterior ischemia (8–12). Direct recording of leads V7–V9 can demonstrate posterior ST-segment elevation and improve diagnostic recognition in patients with suspicious anterior reciprocal changes (9–12). The relatively low frequency found in this study therefore does not diminish the clinical importance of the diagnosis, because missed recognition may delay reperfusion in patients with an acute coronary occlusion.

The posterior myocardium is commonly supplied by the posterior descending artery, which usually originates from the right coronary artery but may arise from the left circumflex artery in left-dominant coronary anatomy. Left circumflex artery occlusion is particularly liable to be under-recognized on a conventional 12-lead electrocardiogram because the affected territory may produce limited or indirect ST-segment changes (16). Case series have demonstrated that isolated posterior STEMI may be associated with left circumflex coronary occlusion and that posterior leads can provide the direct electrocardiographic evidence required for timely diagnosis (17). Angiographic confirmation was not systematically available in the present study, and the responsible coronary artery could therefore not be determined.

The mean duration of complaint reported in this cohort was 7.46 hours, with substantial variability. Delayed presentation after the onset of acute myocardial infarction symptoms has also been described in South Asian populations (15,18). Such delays may reduce access to time-sensitive reperfusion therapies and increase the extent of myocardial injury. Although low educational attainment, occupational status, financial barriers, symptom interpretation, and access to emergency transport may contribute to delayed presentation in similar settings, these factors were not directly measured in the present study and cannot be inferred from the available data.

Most participants were male and older than 50 years, which is consistent with the demographic profile reported in several regional STEMI cohorts (15,18–20). Isolated posterior-wall myocardial infarction occurred numerically more often among men than women, but the difference was not statistically significant. Similarly, no statistically significant associations were identified for age group, body mass index, socioeconomic status, educational status, residence, or occupational status. These results should not be interpreted as evidence that the demographic variables are unrelated to posterior-wall infarction, because only six cases were observed and several subgroup categories contained no outcome events.

This study has several strengths. It addressed an under-recognized electrocardiographic presentation in a tertiary-care population and reported a clearly defined primary frequency. The use of posterior leads and reciprocal anterior changes as diagnostic criteria provided a clinically relevant approach to case identification. The results were also presented with an exact estimate of uncertainty for the primary outcome.

Several limitations should be considered. The study was conducted at a single tertiary-care centre, limiting the generalisability of the findings to other hospitals and community settings. The sample included only 120 patients, and the occurrence of six isolated posterior-wall myocardial infarctions produced wide confidence intervals and limited the ability to identify demographic associations. The original study records should confirm that posterior leads V7–V9 were obtained consistently in all enrolled patients; selective posterior-lead recording could introduce verification bias and underestimate the true frequency. Coronary angiography was not systematically available for anatomical confirmation of the culprit vessel. The study also did not report blinded or independent ECG interpretation, interobserver agreement, serial ECG findings, reperfusion treatment, in-hospital complications, or patient outcomes. In addition, the reported mean age should be revalidated against the eligibility criteria, and the markedly variable duration of complaint may be better represented by the median and interquartile range if the raw data confirm a skewed distribution.

CONCLUSION

Isolated posterior-wall myocardial infarction was identified in 5.0% of patients presenting with ST-elevation myocardial infarction at the study centre. Although relatively infrequent, this presentation remains clinically important because posterior infarction may appear as reciprocal anterior ST-segment depression on a standard 12-lead electrocardiogram. Consistent use of posterior leads in patients with suspicious electrocardiographic findings may support timely recognition, while larger multicentre studies with standardized ECG acquisition and angiographic confirmation are required to establish a more precise frequency.

REFERENCES

1. Javila B, Atuhaire L, Bosco AJ, Tumusiime S, Dick N. Risk factors associated with myocardial infarction among patients at Uganda Heart Institute, Mulago National Referral Hospital in Uganda. BMC Cardiovasc Disord. 2025;25(1):491. doi:10.1186/s12872-025-04946-8.

2. Russo M, Gurgoglione FL, Russo A, Rinaldi R, Torlai Triglia L, Foschi M, et al. Coronary artery disease and atherosclerosis in other vascular districts: epidemiology, risk factors and atherosclerotic plaque features. Life (Basel). 2025;15(8):1226. doi:10.3390/life15081226.

3. Mavungu Mbuku JM, Mukombola Kasongo A, Goube P, Miltoni L, Nkodila Natuhoyila A, et al. Factors associated with complications in ST-elevation myocardial infarction: a single-center experience. BMC Cardiovasc Disord. 2023;23(1):468. doi:10.1186/s12872-023-03498-z.

4. Öztürk C, Özkan U, Çakır B, Ebik M, Yalta K. ST-segment elevation myocardial infarction as a potentially fatal outcome of variant angina: a case report. Acta Cardiol Sin. 2025;41(4):575–578. doi:10.6515/ACS.202507_41(4).20250428A.

5. Elendu C, Amaechi DC, Elendu TC, Omeludike EK, Alakwe-Ojimba CE, et al. Comprehensive review of ST-segment elevation myocardial infarction: understanding pathophysiology, diagnostic strategies, and current treatment approaches. Medicine (Baltimore). 2023;102(43):e35687. doi:10.1097/MD.0000000000035687.

6. Rodríguez EA, Rosati M, Aladio JM, Costa D, Vargas AF, Swieszkowski SP. ST-segment depression in aVR: an overlooked finding associated with an anterior infarction. JACC Case Rep. 2025;30(4):102946. doi:10.1016/j.jaccas.2024.102946.

7. Eftychiou S, Kalakoutas A, Proudfoot A. The role of temporary mechanical circulatory support in de novo heart failure syndromes with cardiogenic shock: a contemporary review. J Intensive Med. 2023;3(2):89–103. doi:10.1016/j.jointm.2022.10.002.

8. Ramjaun A, Garg A, Klaiman M, Sibbald M, Dong JK. ECG changes in a case of posterior myocardial infarction in the presence of right bundle branch block. Cureus. 2021;13(2):e13281. doi:10.7759/cureus.13281.

9. Khan J, Chauhan A, Mozdiak E, Khan JM, Varma C. Posterior myocardial infarction: are we failing to diagnose this? Emerg Med J. 2012;29(1):15–18. doi:10.1136/emj.2010.099861.

10. García-Arias MR, Salinas-Ulloa CY, Maravilla-Jiménez LR, Pinales-Salas R. Isolated posterior acute myocardial infarction: the responsible for subtle changes in the electrocardiogram. Arch Cardiol Mex. 2024;94(1):115–119. doi:10.24875/ACM.22000287.

11. Levis JT. ECG diagnosis: isolated posterior wall myocardial infarction. Perm J. 2015;19(4):e143–e144. doi:10.7812/TPP/14-244.

12. Hähnle L, Viljoen C, Hoevelmann J, Gill R, Chin A. Posterior infarction: a STEMI easily missed. Cardiovasc J Afr. 2020;31(6):331–334. doi:10.5830/CVJA-2020-059.

13. Lim HC, Goh SH, Fadil MF. Isolated posterior acute myocardial infarction presenting to an emergency department: diagnosis and emergent fibrinolytic therapy. Hong Kong J Emerg Med. 2008;15(1):27–35.

14. Din I, Adil M, Hameedullah, Faheem M, Abbas Shah F, Hafizullah M. Accuracy of 12-lead ECG for diagnosis of posterior myocardial infarction. J Postgrad Med Inst. 2014;28(2):145–148.

15. Kumar P, Durdana S. Clinical profile of ST-elevation myocardial infarction patients from a tertiary care hospital in northern India. Int J Adv Med. 2021;8(11):1669–1673. doi:10.18203/2349-3933.ijam202141502.

16. Ghanim D, Kusniec F, Kinany W, Qarawani D, Meerkin D, et al. Left circumflex coronary artery as the culprit vessel in ST-segment-elevation myocardial infarction. Tex Heart Inst J. 2017;44(5):320–325. doi:10.14503/THIJ-16-5905.

17. Alsagaff MY, Amalia R, Dharmadjati BB, Appelman Y. Isolated posterior ST-elevation myocardial infarction: the necessity of routine 15-lead electrocardiography: a case series. J Med Case Rep. 2022;16(1):321. doi:10.1186/s13256-022-03475-7.

18. Ali L, Abid AR, Ahmad J, Niaz N, Rehman TA, Azhar M. Myocardial infarction: clinical predictors of in-hospital complications in patients presenting with acute ST-segment elevation. Prof Med J. 2011;18(3):418–425.

19. Siddiquei M, Hussain S, Ahmed S. Frequency and outcome of right ventricular infarct in patients with inferior-wall myocardial infarction during hospital stay. Prof Med J. 2016;23(10):1288–1292.

20. Akram M, Ali SN, Zareef A. Frequency and in-hospital mortality of right ventricular infarction in patients with inferior ST-segment elevation myocardial infarction. Pak J Med Health Sci. 2015;9(4):1162–1165.

21. Rakun ADU, Yeo MYW. Posterior STEMI presenting as painless, isolated left arm numbness and weakness: a case report. Int J Emerg Med. 2025;18:47. doi:10.1186/s12245-025-00845-z.

22. Brown L, Sims J, Conforto A. Posterior myocardial infarction with isolated ST elevations in V8 and V9: is this an “ST elevation MI”? CJEM. 2003;5(2):115–118. doi:10.1017/S1481803500008265.