Section: Emergency Medicine and Critical Care

Case Series

BEYOND CHEST PAIN: RECOGNISING PAINLESS MYOCARDIAL INFARCTION IN THE EMERGENCY DEPARTMENT-A CASE SERIES

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ABSTRACT

Background: Acute myocardial infarction (AMI) may occur without chest pain and can be difficult to recognise when patients present with gastrointestinal, autonomic, respiratory, neurological, or referred pain symptoms. The objective is to describe the clinical presentations, diagnostic delays, initial electrocardiographic findings, treatment, and short-term outcomes of patients with AMI who presented without chest pain.

Materials and Methods: We retrospectively reviewed 10 consecutive adults with cardiology-confirmed AMI who presented to a tertiary-care emergency department in Chennai, India, over a 6-month period. The inclusion criterion was complete absence of chest pain, tightness, or pressure during initial triage and emergency physician assessment.

Results: The median age was 54 years (range, 40–86 years); seven patients were male and three were female. Six patients had type 2 diabetes mellitus and five had hypertension. Nine patients had STEMI or a STEMI-equivalent pattern and one had NSTEMI. Non-chest-pain presentations included diaphoresis in four patients (40%), giddiness, collapse, or altered responsiveness in three (30%), referred upper-body pain or burning in three (30%), and gastrointestinal symptoms in two (20%); one patient each (10%) presented predominantly with acute dyspnoea or oropharyngeal symptoms. Prehospital delays ranged from 1 to 72 hours. Six patients received tenecteplase and two underwent primary percutaneous coronary intervention. Three patients presented with or rapidly developed cardiogenic shock. Two patients died in the emergency department, one after refractory cardiogenic shock and the other after refractory ventricular tachyarrhythmia; one patient left against medical advice and seven survived the acute phase.

Conclusion: AMI without chest pain may present with nonspecific systemic or referred symptoms and can lead to delayed recognition. Emergency triage should maintain a low threshold for ECG in adults with unexplained gastrointestinal, autonomic, respiratory, neurological, or upper-body symptoms, particularly when cardiovascular risk factors are present.

Keywords: Acute myocardial infarction; Painless myocardial infarction; Atypical presentation; Emergency department; STEMI

INTRODUCTION

Acute coronary syndrome (ACS) is commonly associated with chest discomfort, but a clinically important proportion of patients present without chest pain. In the multinational GRACE registry, 1,763 of 20,881 patients with ACS (8.4%) presented without chest pain; these patients were less frequently recognised initially and had differences in

management and outcomes compared with those presenting with chest pain.[1] The 2023 European Society of Cardiology (ESC) guideline emphasises early assessment of suspected ACS across the full clinical spectrum rather than relying on a single symptom pattern.[2]

Patients may present with dyspnoea, nausea or vomiting, diaphoresis, syncope or presyncope, weakness, or pain referred to the arm, shoulder, neck, or throat. Diabetes is associated with impaired recognition of myocardial ischaemia in some patients, in part because of autonomic dysfunction.[3]

Risk scores must be applied within the population in which they were validated. The HEART score was developed and validated for patients presenting with suspected ACS and chest pain; it is not a diagnostic tool for patients with an established STEMI pattern.[4] In a patient whose ECG already demonstrates STEMI or a STEMI-equivalent pattern, immediate STEMI management takes precedence over retrospective risk stratification with HEART.

We describe a consecutive case series of 10 adults with confirmed AMI who presented to the emergency department without chest pain. The aim was to highlight the range of presentations, potential points of diagnostic delay, and the implications for emergency triage.

MATERIALS AND METHODS

Study design and setting: This retrospective case series included 10 consecutive adult patients diagnosed with AMI by the cardiology service who presented to a tertiary-care emergency department in Chennai, India, over a 6-month period. According to the source clinical record, medical emergency patients presenting to the emergency department underwent ECG assessment irrespective of the presenting complaint.

Eligibility criteria: The defining inclusion criterion was complete absence of chest pain, tightness, or pressure during initial triage and subsequent assessment by the emergency physician. Patients with trauma and patients with incomplete medical records were excluded.

Data collected: Data extracted from the available clinical records included age, sex, cardiovascular comorbidities, presenting complaint, haemodynamic status, ECG diagnosis, initial reperfusion strategy, major complications, and disposition or short-term outcome. The case series was descriptive; no inferential statistical testing was performed.

Risk stratification: Individual HEART scores were not calculated retrospectively because the source records did not provide all score components in a sufficiently standardised form and because nine of the ten patients had STEMI or a STEMI-equivalent ECG pattern. The HEART score is intended for risk stratification among patients with suspected ACS/chest pain, rather than for patients with diagnostic ST-elevation patterns.[4]

Ethics: The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Written informed consent for publication was obtained from the patients and/or their legally authorised attendants for the use of relevant clinical information for academic and publication purposes. All patient-related information was anonymised to maintain confidentiality.

RESULTS

The cohort comprised seven men and three women, with a median age of 54 years (range, 40–86 years). Type 2 diabetes mellitus was present in six patients (60%) and hypertension in five (50%); three patients had both conditions, three had diabetes alone, and two had hypertension alone. Nine patients (90%) had STEMI or a STEMI-equivalent pattern on the initial ECG and one (10%) had NSTEMI. Reported prehospital delays ranged from 1 to 72 hours.

Six patients received tenecteplase in the emergency department because of affordability constraints, and two underwent primary PCI. Three patients presented with or rapidly developed cardiogenic shock. Two patients died in the emergency department, one after refractory cardiogenic shock and the other after refractory ventricular tachyarrhythmia. One patient left against medical advice soon after admission. Seven patients survived the acute phase and continued inpatient management, including PCI, planned CAG, or intensive medical therapy.

Table 1: Summary characteristics of the case series

Characteristic	Value
Patients	10
Median age, years (range)	54 (40–86)
Male sex	7 (70%)
Female sex	3 (30%)
Type 2 diabetes mellitus	6 (60%)
Hypertension	5 (50%)
STEMI / STEMI-equivalent ECG	9 (90%)
NSTEMI	1 (10%)
Prehospital delay	1–72 hours
Tenecteplase administered	6 (60%)
Primary PCI	2 (20%)
Cardiogenic shock present / developed	3 (30%)
Death in ED / in-hospital mortality in series	2 (20%)
Left against medical advice	1 (10%)

Table 2: Clinical characteristics, presentations, and outcomes of the 10 patients

Case	Age / Sex	Comorbidities	Presenting complaint(s)	Haemodynamic status	ECG findings	Outcome
1	55 / Male	T2DM, HTN	Progressive abdominal bloating; non-bilious vomiting for 4 days	Cardiogenic shock (BP 80/60 mmHg)	Inferior-wall STEMI	Survived; transferred for PCI
2	45 / Male	T2DM, HTN	Persistent belching; intractable nausea for 3 days	Stable	NSTEMI	Survived; scheduled for CAG
3	42 / Male	None	Sudden severe giddiness leading to a mechanical fall	Stable	Evolving inferior STEMI	Survived; scheduled for CAG
4	86 / Female	HTN	Sudden giddiness; altered responsiveness; unable to stand	Cardiogenic shock (BP 80/60 mmHg)	Posterior-inferior STEMI	Died in ED despite resuscitation
5	54 / Male	None	Left shoulder pricking pain; unprovoked vomiting	Stable	Anterior-wall STEMI	Survived; post-PCI
6	60 / Female	T2DM	Acute throat pain; dysphagia; choking sensation	Hypertensive emergency (BP 190/100 mmHg)	Anteroseptal STEMI	Left against medical advice
7	50 / Male	T2DM	Profuse diaphoresis; upper-body burning sensation	Stable; hypertensive	Inferior-wall STEMI	Survived; post-thrombolysis
8	40 / Male	T2DM	Dizziness; diaphoresis; involuntary defecation; collapse	Pulseless; agonal breathing	Massive anterior STEMI	Died in ED; refractory VT despite resuscitation
9	60 / Female	T2DM, HTN	Acute severe dyspnoea at rest; diaphoresis	Acute pulmonary oedema; hypoxia	Extensive anterolateral STEMI	Survived; post-thrombolysis
10	54 / Male	HTN	Isolated severe left arm pain; diaphoresis	Stable	High-lateral STEMI	Survived; post-thrombolysis

Table 3: Distribution of non-chest-pain presentation domains and ECG patterns represented in the case series

Presentation domain	Case(s)	n (%)	ECG pattern(s) represented
Gastrointestinal symptoms	1, 2	2 (20%)	Inferior-wall STEMI; NSTEMI
Giddiness / collapse / altered responsiveness	3, 4, 8	3 (30%)	Evolving inferior STEMI; posterior-inferior STEMI; massive anterior STEMI
Diaphoresis	7, 8, 9, 10	4 (40%)	Inferior-wall STEMI; massive anterior STEMI; extensive anterolateral STEMI; high-lateral STEMI
Referred upper-body pain / burning	5, 7, 10	3 (30%)	Anterior-wall STEMI; inferior-wall STEMI; high-lateral STEMI
Acute dyspnoea	9	1 (10%)	Extensive anterolateral STEMI
Oropharyngeal symptoms	6	1 (10%)	Anteroseptal STEMI

The presenting phenotype was heterogeneous, with overlapping gastrointestinal, autonomic, neurological or collapse-related, respiratory, oropharyngeal, and referred upper-body symptom domains. Diaphoresis was the most frequently represented presentation domain. The associated ECG findings spanned inferior, anterior, anteroseptal, anterolateral, high-lateral, posterior-inferior, and NSTEMI patterns (Table 3).

Table 4: Descriptive relationship between cardiogenic shock and short-term outcome

Haemodynamic category	Patients, n (%)	Documented ED / short-term outcome
Cardiogenic shock present or rapidly developed	3 (30%)	2 died in ED; 1 survived acute phase and was transferred for PCI
Remaining cases without cardiogenic shock documented	7 (70%)	6 survived acute phase; 1 left against medical advice; no death documented

Cardiogenic shock was present or rapidly developed in three patients (30%). The observed outcomes are summarised in Table 4. This descriptive pattern suggests that haemodynamic instability was associated with poor short-term outcomes in this small series; however, the limited sample size and

retrospective design preclude inference of a statistical association.

DISCUSSION

This case series illustrates how AMI can present without central chest pain and how the presenting complaint may direct attention away from the cardiovascular system. The 10 patients had gastrointestinal symptoms, dizziness or collapse, throat symptoms, dyspnoea, diaphoresis, or isolated referred pain. The range of presentations is consistent with the broader literature describing ACS without chest pain as an under-recognised clinical group.[1]

The predominance of diabetes in this cohort is clinically relevant. Six of the ten patients had type 2 diabetes. Diabetic cardiovascular autonomic neuropathy has been associated with impaired recognition of myocardial ischaemia, although the relationship is complex and cannot be assumed to be causal in an individual patient.[3,5] The present case series did not include formal autonomic testing, so the mechanism of painless or minimally painful presentation cannot be established for individual patients.

Several presentations could plausibly be mistaken for non-cardiac illness. An additional observation from the case-level data is that painless AMI in this series represented a heterogeneous clinical phenotype rather than a single symptom-defined presentation. The cases included gastrointestinal, neurological or collapse-related, autonomic, respiratory, oropharyngeal, and referred upper-body presentations, with overlap between symptom domains. Importantly, this heterogeneity occurred across both STEMI/STEMI-equivalent and NSTEMI patterns. The case series therefore adds clinical detail at the presentation level without implying that any individual symptom is specific for AMI.[6-10]

Abdominal bloating, vomiting, belching, and nausea occurred in patients with inferior-wall infarction, while giddiness or collapse occurred in two patients. Inferior myocardial ischaemia may be accompanied by nausea and vomiting through autonomic and vagal pathways, although the individual mechanisms cannot be confirmed from this retrospective dataset. Upper-body referred symptoms were also represented by throat, shoulder, and arm symptoms.

The practical implication for emergency medicine is not that every patient with a non-cardiac complaint has ACS, but that the absence of chest pain should not by itself remove ACS from the differential diagnosis when the overall clinical picture is concerning. The 2023 ESC guideline supports rapid ECG assessment in patients with suspected ACS, and emergency clinicians should maintain a low threshold for ECG when unexplained symptoms occur in patients with cardiovascular risk factors or when there are features such as diaphoresis, syncope, acute dyspnoea, or haemodynamic instability.[2]

The HEART score requires particular caution in this context. It was validated in patients presenting with chest pain and is intended to support risk stratification rather than to diagnose STEMI.[4] In this series, nine patients had STEMI or a STEMI-equivalent pattern on the initial ECG. For these patients, the ECG itself established a high-risk ACS pathway, making calculation of HEART score inappropriate for deciding whether the patient required cardiac evaluation. The single NSTEMI case did not contain sufficient standardised information in the source records to calculate a defensible retrospective HEART score. Rather than assigning speculative scores, it is more appropriate to state that the clinical pathway was potentially vulnerable before ACS was suspected. The source clinical record also notes that medical emergency patients in the emergency department underwent ECG assessment irrespective of the presenting complaint. This is relevant when interpreting the series: the reported cases arose within a setting in which ECG acquisition was not restricted to patients reporting chest pain. Accordingly, the present series describes the clinical spectrum and short-term outcomes of AMI without chest pain under a broad ECG-assessment practice; it does not estimate the frequency of missed AMI attributable to a complaint-based ECG policy.

An important strength of this series is that the patients were consecutive cases identified from a defined emergency-department population. However, several limitations must be considered. The sample size was small and the study was retrospective and single-centre. The case series cannot estimate the incidence of painless AMI in the presenting population or establish associations between individual symptoms and outcomes. Prehospital timing was dependent on patient or bystander recall and documentation. In addition, laboratory values, coronary anatomy, left ventricular function, detailed ECG measurements, and longer-term outcomes were not available in the supplied dataset. Because the cohort was small and symptom domains overlapped, the observed frequencies describe the presentation spectrum of these 10 cases and should not be interpreted as estimates of the prevalence or predictive value of individual symptoms in the wider emergency-department population.

Clinical Implication: In adults without chest pain, this case series demonstrates that AMI may coexist with unexplained gastrointestinal symptoms, diaphoresis, giddiness or collapse, acute dyspnoea, or referred upper-body or oropharyngeal symptoms. Nine of ten patients had STEMI or a STEMI-equivalent pattern on the initial ECG. These observations support maintaining clinical suspicion and obtaining timely ECG assessment when the overall presentation is concerning, while recognising that this 10-patient retrospective series cannot define a screening rule or symptom-based diagnostic threshold.

CONCLUSION

AMI may present without central chest pain and may instead manifest as gastrointestinal symptoms, diaphoresis, dyspnoea, dizziness or collapse, or referred upper-body symptoms. In this series, nine of ten patients had STEMI or a STEMI-equivalent ECG pattern and two died. Emergency clinicians should avoid using the absence of chest pain as a reason to dismiss ACS when unexplained high-risk symptoms or cardiovascular risk factors are present. The emphasis should be on early clinical suspicion and timely ECG acquisition rather than retrospective application of a chest-pain risk score to patients with an established STEMI pattern.

REFERENCES

1. Brieger D, Eagle KA, Goodman SG, Steg PG, Budaj A, White K, et al. Acute coronary syndromes without chest pain, an underdiagnosed and undertreated high-risk group: insights from the Global Registry of Acute Coronary Events. Chest. 2004;126(2):461-469. doi:10.1378/chest.126.2.461.
2. Byrne RA, Rossello X, Coughlan JJ, et al. 2023 ESC Guidelines for the management of acute coronary syndromes. Eur Heart J. 2023;44(38):3720-3826. doi:10.1093/eurheartj/ehad191.
3. Vinik AI, Erbas T. Diabetic autonomic neuropathy. Diabetes Care. 2003;26(5):1553-1579. doi:10.2337/diacare.26.5.1553.
4. Backus BE, Six AJ, Kelder JC, et al. A prospective validation of the HEART score for chest pain patients at the emergency department. Int J Cardiol. 2013;168(3):2153-2158. doi:10.1016/j.ijcard.2012.12.027.
5. Niakan E, Harati Y, Rolak LA, Comstock JP, Rokey R. Silent myocardial infarction and diabetic cardiovascular autonomic neuropathy. Arch Intern Med. 1986;146(11):2229-2230. doi:10.1001/archinte.1986.00360230169023.
6. Bandey W, Begum R, Khan M, Davis T. An atypical presentation of ST-segment elevation myocardial infarction in a 30-year-old male patient: a case report. Cureus. 2025;17(9):e93586. doi:10.7759/cureus.93586.
7. Perona M, Cooklin A, Thorpe C, O'Meara P, Rahman MA. Symptomology, outcomes and risk factors of acute coronary syndrome presentations without cardiac chest pain: a scoping review.Eur Cardiol. 2024;19:e12. doi:10.15420/ecr.2023.45.
8. Kwok CS, Bennett S, Holroyd E, Satchithananda D, Borovac JA, Will M, et al. Characteristics and outcomes of patients with acute coronary syndrome who present with atypical symptoms: a systematic review, pooled analysis and meta-analysis. Coron Artery Dis. 2025;36(3):240-251. doi:10.1097/MCA.0000000000001462.
9. Goel PK, Srivastava SK, Ashfaq F, Gupta PR, Saxena PC, Agarwal R, et al. A study of clinical presentation and delays in management of acute myocardial infarction in community. Indian Heart J. 2012;64(3):295-301. doi:10.1016/S0019-4832(12)60090-X.
10. Canto JG, Shlipak MG, Rogers WJ, Malmgren JA, Frederick PD, Lambrew CT, et al. Prevalence, clinical characteristics, and mortality among patients with myocardial infarction presenting without chest pain. JAMA. 2000;283(24):3223-3229. doi:10.1001/jama.283.24.3223.