



## Red flag sign of ECG- Evolving high anterior wall myocardial infarction

Mayank Yadav <sup>1\*</sup>, Balasubramanian R<sup>2</sup>

<sup>1</sup>Department of cardiology PGIMER, Chandigarh University Chandigarh, India

<sup>2</sup>Department of internal medicine IGMC, Chandigarh University, Pudukcherry, India

\*Corresponding author: Mayank Yadav, <sup>1</sup>Department of cardiology PGIMER, Chandigarh University Chandigarh, India E-mail: marwabelhaj2@gmail.com

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### Abstract

Coronary artery disease including acute coronary syndrome is most common cause of mortality worldwide. Acute coronary syndrome which includes ST segment elevation myocardial infarction carries worse prognosis particularly when involves anterior wall of left ventricle. Anterior wall myocardial infarction diagnosed when ECG shows ST segment elevation in precordial leads is present. Depending upon site of occlusion in left anterior descending anterior artery and branches, anterior wall myocardial can be high lateral, anteroseptal and extensive anterior wall myocardial infarction diagnosed with ECG.

Keywords: Artery coronary syndrome; Precordial; Anteroseptal; Myocardial

### Introduction

Coronary artery disease including acute coronary syndrome is most common cause of mortality worldwide. Acute coronary syndrome which includes ST segment elevation myocardial infarction carries worse prognosis particularly when involves anterior wall of left ventricle.

Anterior wall myocardial infarction diagnosed when ECG shows ST segment elevation in precordial leads is present. Depending upon site of occlusion in left anterior descending anterior artery and branches, anterior wall myocardial can be high lateral, anteroseptal and extensive anterior wall myocardial infarction diagnosed with ECG.

**Clinical record:** An 86-year-old female present to our emergency department with complain of chest pain for about 15 hours duration. On arrival to emergency department clinical examination was unremarkable and she was hemodynamically stable with pulse rate of 70/min and blood pressure of 135/100 mmHg. She denied past history of cardiovascular diseases. She did not have any comorbidities. She came to our ED with an ECG which was done about 5 hours back (Figure.1).

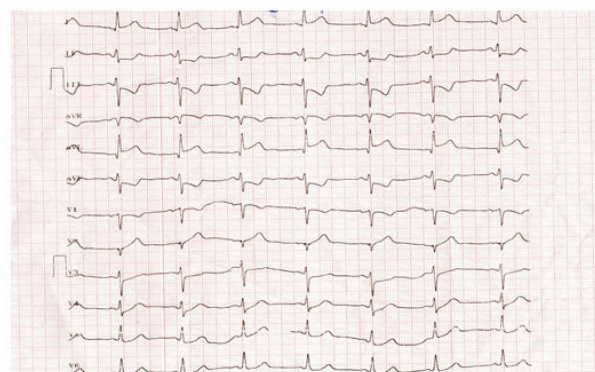
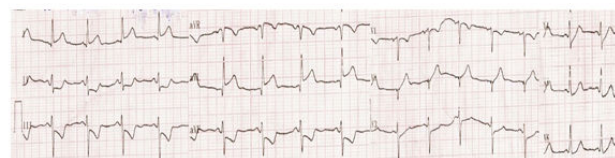


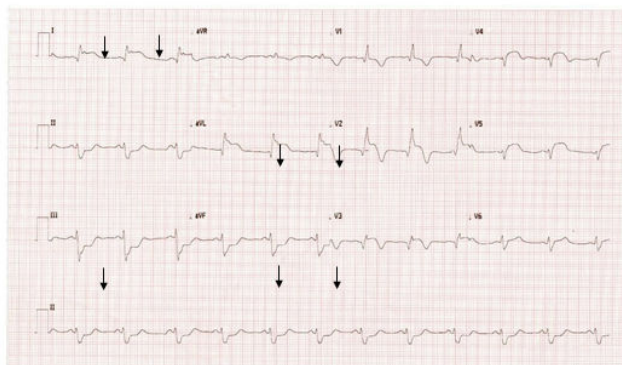
Figure 1. First ECG shows ST segment elevation in leads I, aVL and V2 with reciprocal ST segment depression in leads II, aVF, III suggestive of high lateral wall myocardial infarction due to D1 block. First ECG (Figure.1) shows normal sinus rhythm with heart rate of 65/min. ECG also shows ST segment elevation in lead I, aVL with upsloping ST segment and hyperacute T wave in lead V2 with reciprocal ST segment depression with T wave depression in leads II, aVF, III. [1] These finding suggestive of acute high lateral wall myocardial infarction due to block of first diagonal artery branch D1 of LAD. As high lateral wall myocardial infarction presents as unique pattern of ST segment elevation in noncontiguous leads which resembles south African flag sign as can be seen in this ECG when change to another format (Figure 2).



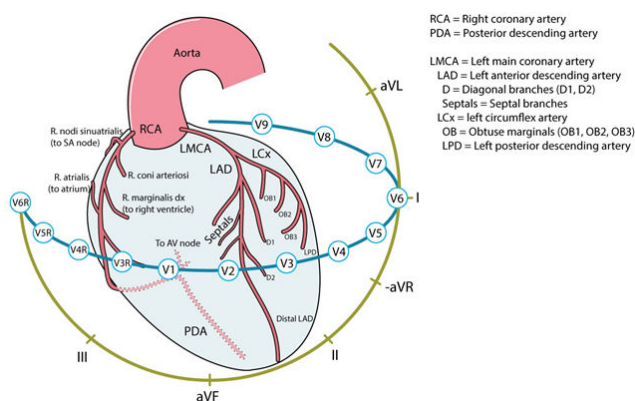
(Figure 2) After rearranging ECG in this format shows South African flag sign of high lateral wall myocardial infarction of D1 block formed by ST segment elevation in leads I, aVL, V2 with ST segments depression in inferior leads. (Figure 3)



(Figure 4) ECG done after admission shows ST segment elevation in leads I, aVL, V2-V5 with depression in inferior leads [2].



(Figure 5) ECG post thrombolysis shows persistent ST segment elevation in leads I, aVL, V2-V5 with depression in inferior leads.



(Figure 6) coronary arteries and their branches.

Chest pain subsided by the time she reached to our emergency department and she treated with antiplatelets and anticoagulants. Serial ECGs were done. Second ECG which was done soon after admission (figure 4) is shows ST segment elevation now progressed and present in lead I, aVL, V2-V5 with complete right bundle branch block and left anterior hemiblock with left axis deviation and presence of few ventricular premature beats in between with reciprocal ST segment depression in leads II, Avf, III. These findings suggestive of extensive anterior wall myocardial infarction due to progression of block from D1 to proximal LAD. So, in view of evolving myocardial infarction thrombolytics were administered and ECG was repeated (fig.5). ECG (fig.5) shows normal sinus rhythm with heart rate of 71/min with further evolved anterior myocardial infarction with ST segment elevation in leads I, aVL, V2-V5 and reciprocal ST segment depression in leads II, Avf, III Presence of qRBBB pattern in lead V1 and left anterior hemiblock and left axis deviation Despite of administration of thrombolytics patient continued deteriorating and developed cardiogenic shock and subsequently cardiac arrest within short span of time and could not be revived [3].

## Discussion

Anterior wall myocardial infarction occurs due to involvement of left coronary artery system which includes left main coronary artery,

left anterior descending and left circumflex rtery (fig. 6). Anterior wall myocardial infarction have poor prognosis as compare to the inferior wall myocardial infarction due to infarction of large amount of myocardium. Left anterior descending artery is the culprit artery causing anterior wall myocardial infarction. Left anterior descending artery arises from left main coronary artery and supply anterior and lateral wall of left ventricle. Its major branches are diagonal and septal artery Infarction pattern of anterior wall myocardial depend upon the site of occlusion of LAD [4].

- Septal = V1-2
- High lateral = I, aVL
- Anterior = V2-5
- Anteroseptal = V1-4
- Anterolateral = V3-6, I + aVL
- Extensive anterior / anterolateral = V1-6, I + aVL

Occlusion of diagonal branch of LAD causes ST segment elevation in leads I, aVL with or without ST elevation in V2. This can evolve and extend to involve main LAD artery. This results in progressive ST segment elevation in other precordial leads. Management of acute coronary syndrome depends upon type of myocardial infarction, time since chest pain onset and patient conditions [5].

## Conclusion

Acute coronary syndrome is common cause of mortality and morbidity with anterior wall myocardial infarction. Carry poor prognosis. Site of occlusion of coronary artery presents with typical pattern in ECG leads. ECG is important, easily available diagnostic tool help in diagnosis and management of acute coronary syndrome.

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