



Journal Homepage: - [www.journalijar.com](http://www.journalijar.com)

## INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/13136

DOI URL: <http://dx.doi.org/10.21474/IJAR01/13136>



### RESEARCH ARTICLE

#### A SEVERE STENOSIS OF THE PROXIMAL SEGMENT OF THE LEFT ANTERIOR DESCENDING CORONARY ARTERY PRESENTING WITH AN INFERO-LATERO-BASAL ST-ELEVATION MYOCARDIAL INFARCTION : A CASE REPORT

S. Nikièma<sup>1</sup>, Z. Lahlafi<sup>1</sup>, M. Désiré<sup>2</sup>, Z. Lakhal<sup>1</sup> and A. Benyass<sup>2</sup>

1. Cardiology Intensive Care Unit, Mohammed V Military Hospital, Rabat, Morocco.
2. Non-Invasive Explorations Department, Mohammed V Military Hospital, Rabat, Morocco.

#### Manuscript Info

##### Manuscript History

Received: 10 May 2021

Final Accepted: 14 June 2021

Published: July 2021

##### Key words:-

Coronary Angiography, Correlation, Electrocardiography, Myocardial Infarction, Left Anterior Descending Coronary Artery, Infero-Latero-Basal ST-Elevation

#### Abstract

A 57-years-old man presented in our department of emergency with an acute chest pain infarct-like. The electrocardiogram realised showed an ST elevation in the infero-latero-basal leads suggesting an occlusion of the right coronary artery or the left circumflex coronary artery. However, the coronary angiography that was performed showed a subocclusion of the proximal left anterior descending coronary artery, in contrast to the expected results. This case was reported using electrocardiography and coronary angiography data and the electrocardiogram changes after a percutaneous coronary intervention. The particularity of this case lies in the lack of correlation between the electrocardiographic Changes and the Coronary Angiographic Findings.

Copy Right, IJAR, 2021., All rights reserved.

#### Introduction:-

Electrocardiography and angiography are inseparable in the management of ST-elevation myocardial infarction (STEMI).

Several studies have shown the correlation between electrocardiography data and angiography (1,2,3,4, 5)

The lesions of The Left anteriordescending (LAD) coronary artery, the right coronary artery, and the left circumflex coronary artery result in ecg changes in the anterior leads, the inferior leads and the lateral leads, respectively.

There are exceptions to this rule.

We report a rare case of an acute coronary syndrome with an infero-latero-basal ST-elevation in the electrocardiography but with a severe stenosis of the proximal LAD coronary artery in the angiography.

#### Case Presentation

Fifty seven-years-old active military man with no previous history of cardiovascular disease, with modifiable cardiovascular risk factors of chronic smoking stopped two months ago, presented to the emergency department complaining for chest pain infarct-like (retrosternal, intense and prolonged, radiating to the upper limbs) started eleven hours ago associated with no exertion.

**Corresponding Author:- S. Nikièma**

Address:- Cardiology Intensive Care Unit, Mohammed V Military Hospital, Rabat, Morocco.

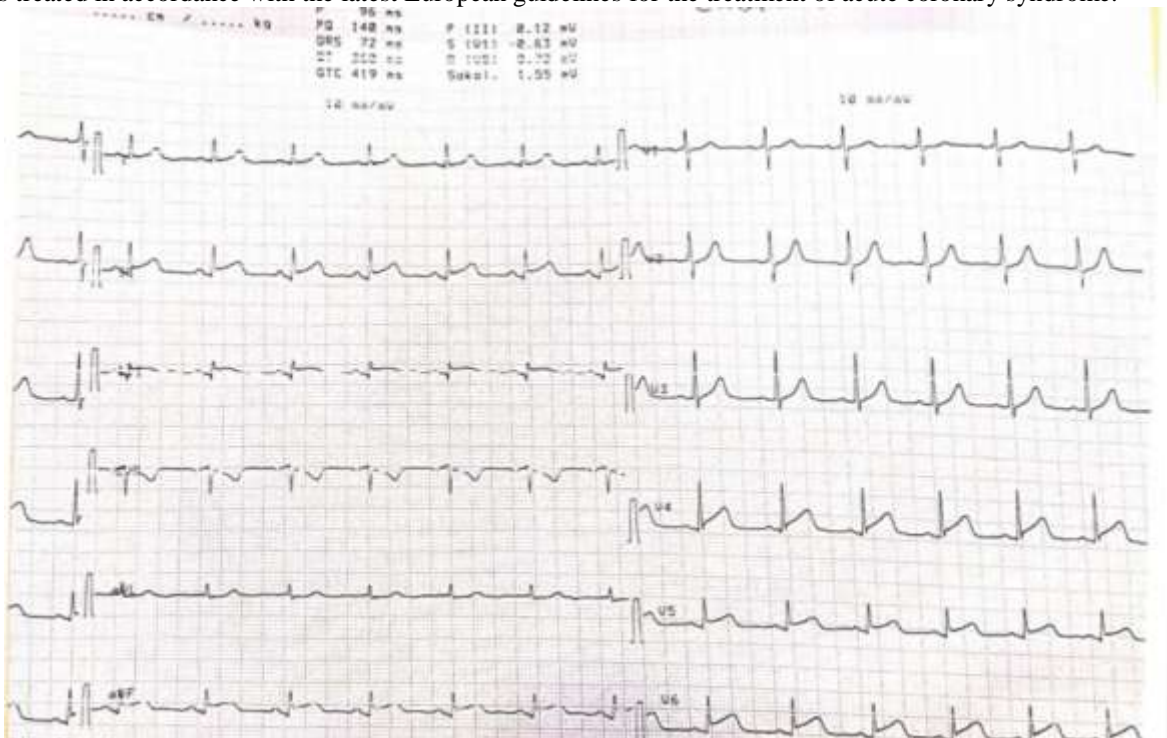
Clinical examination was normal, blood pressure 150/90 mmhg, heart rate 81 beats per minute, afebrile.

The precritical electrocardiogram revealed a 1.5-mm ST-segment elevation with a convex appearance in the inferior leads associated with Q waves, a 1-mm ST-segment in V5-V6, 0.5-mm ST-segment elevation in the posterior leads associated with Q waves (Figure 1a).

Without waiting for the troponin assay, the patient was immediately admitted to the interventional catheterization room after receiving a loading dose of antithrombotic medication. Coronary angiography performed via the right radial approach showed a significant stenosis of the proximal LAD coronary artery undergoing primary angioplasty with active stent implantation, the left circumflex coronary artery and the right coronary artery were free of lesions (Figure 2a,b,c,d,e).

The electrocardiogram performed immediately after coronary angiography showed persistent ST-segment elevation in the inferior and low lateral leads, there were no electrical changes. (Figure 1b).

However, the next day, the evolution was marked by the appearance of asymmetric negative T waves in the precordial leads, confirming the LAD coronary artery is the culprit artery. (figure 1c). The peak troponin level was 6845 ng/l (more than 100 times normal) and the metabolic panel was normal. The results of the transthoracic echocardiography showed hypokinesis of the inferoseptal wall with a preserved ejection fraction. There were no post-operative complications, and the patient had stable haemodynamics and rhythm until discharge. The patient was treated in accordance with the latest European guidelines for the treatment of acute coronary syndrome.



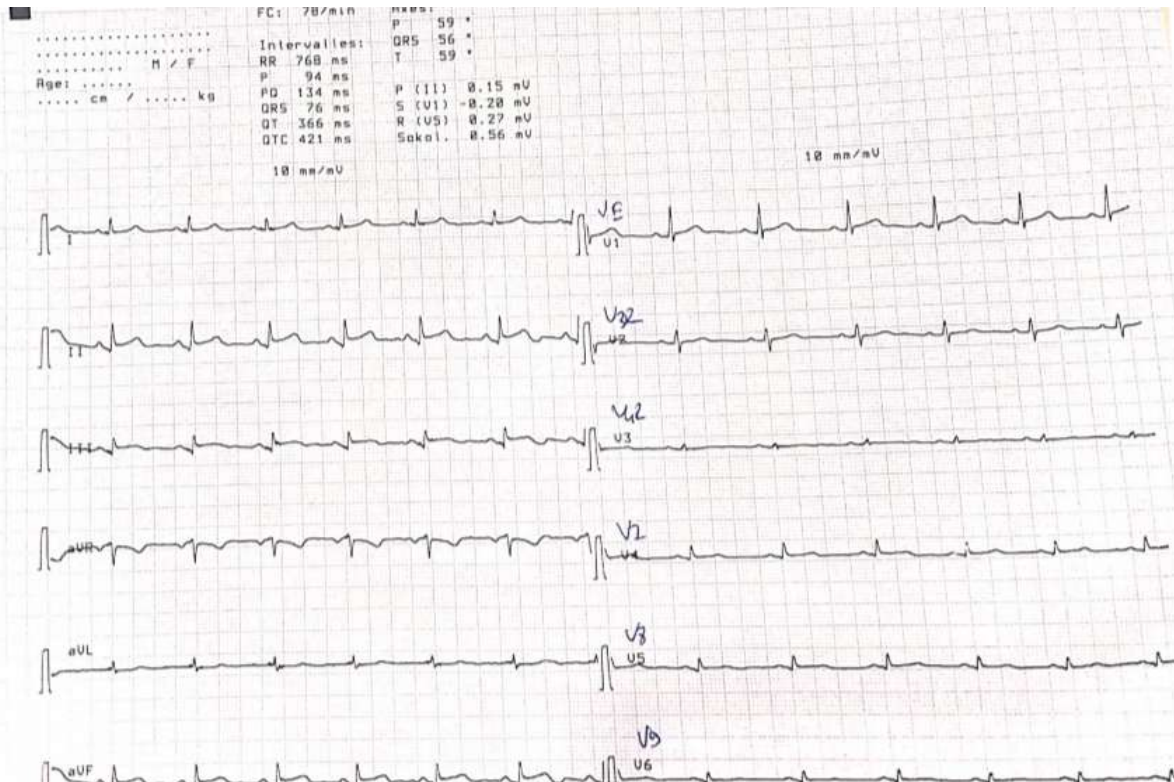


Figure 1a:- Electrocardiogram at admission showing an ST-elevation in the infero-latero-basal leads.

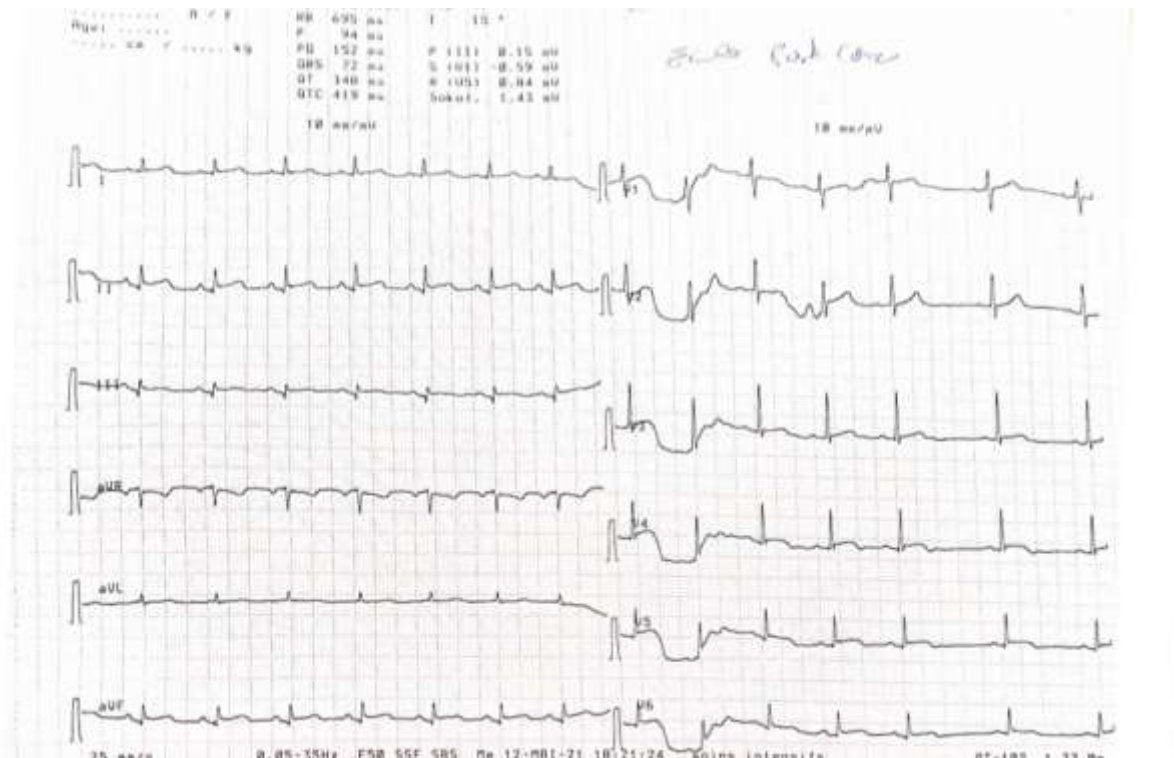


Figure 1b:- Electrocardiogram right after coronary angiography.



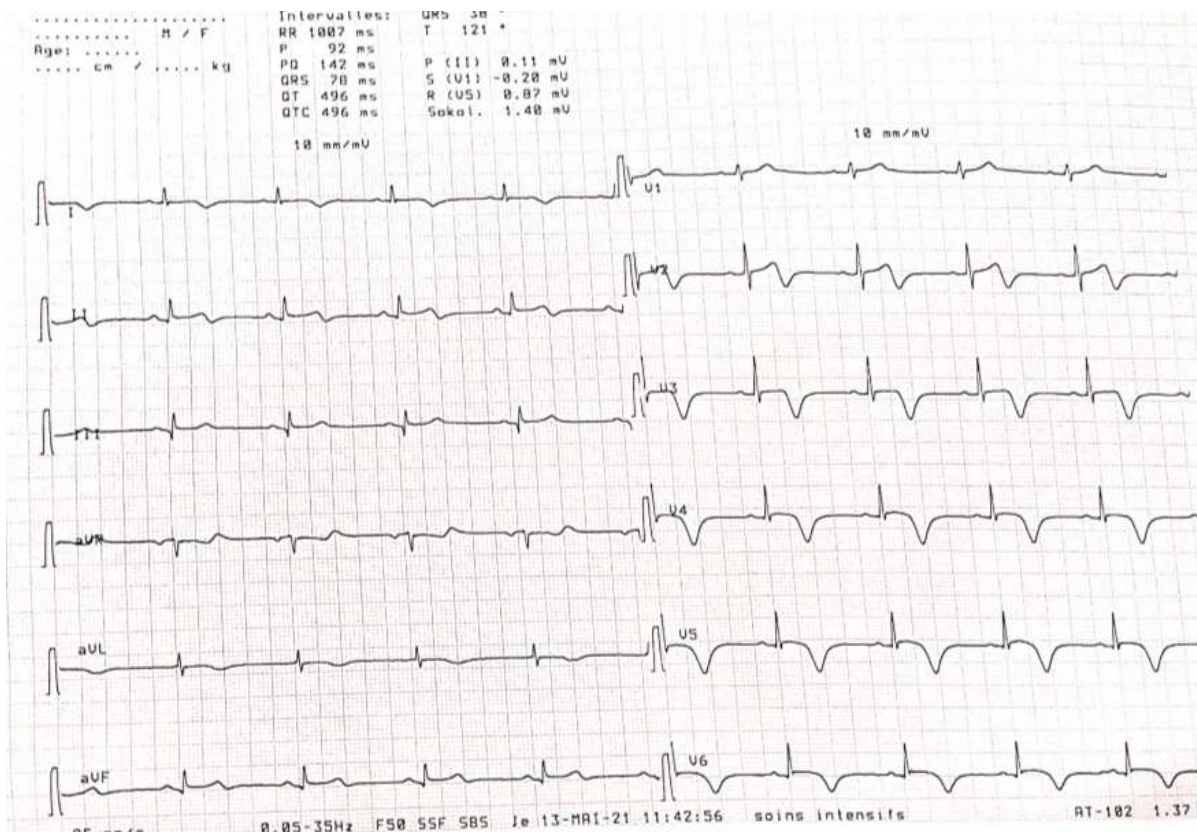
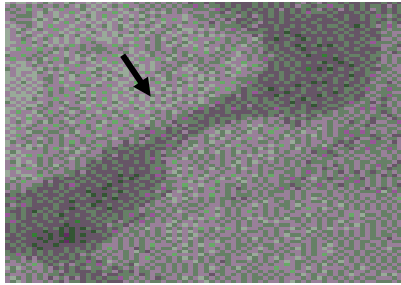


Figure 1c:- Electrocardiogram 24 hours after reperfusion.

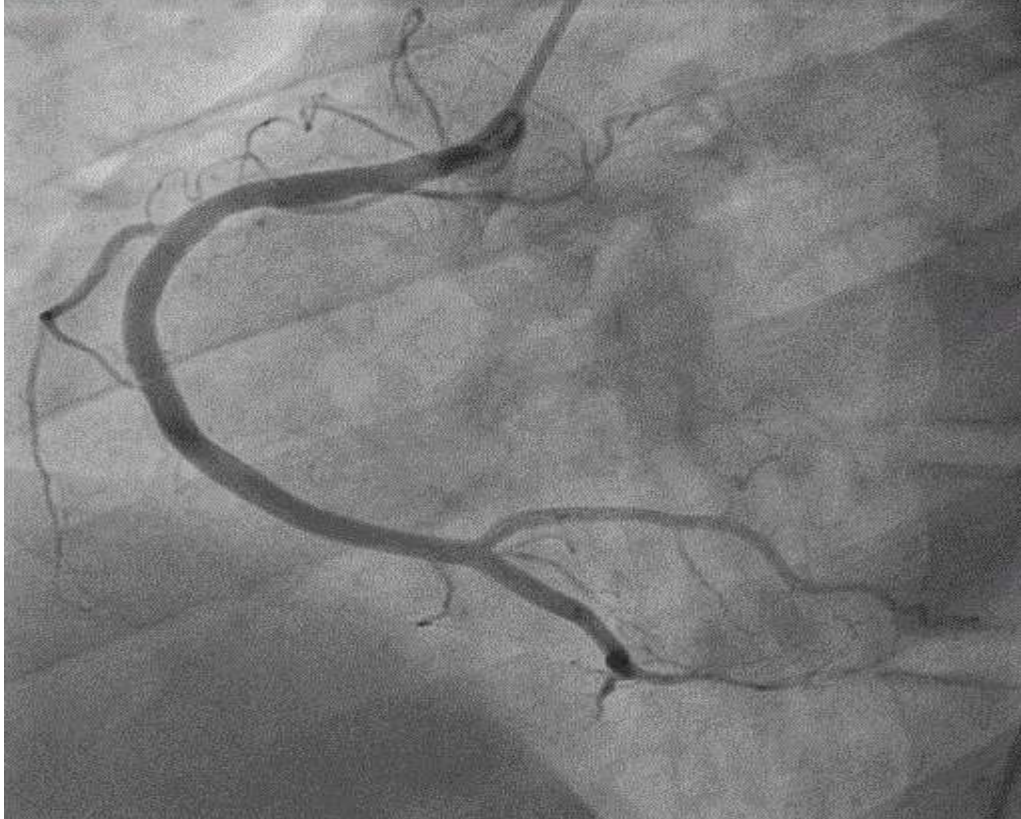




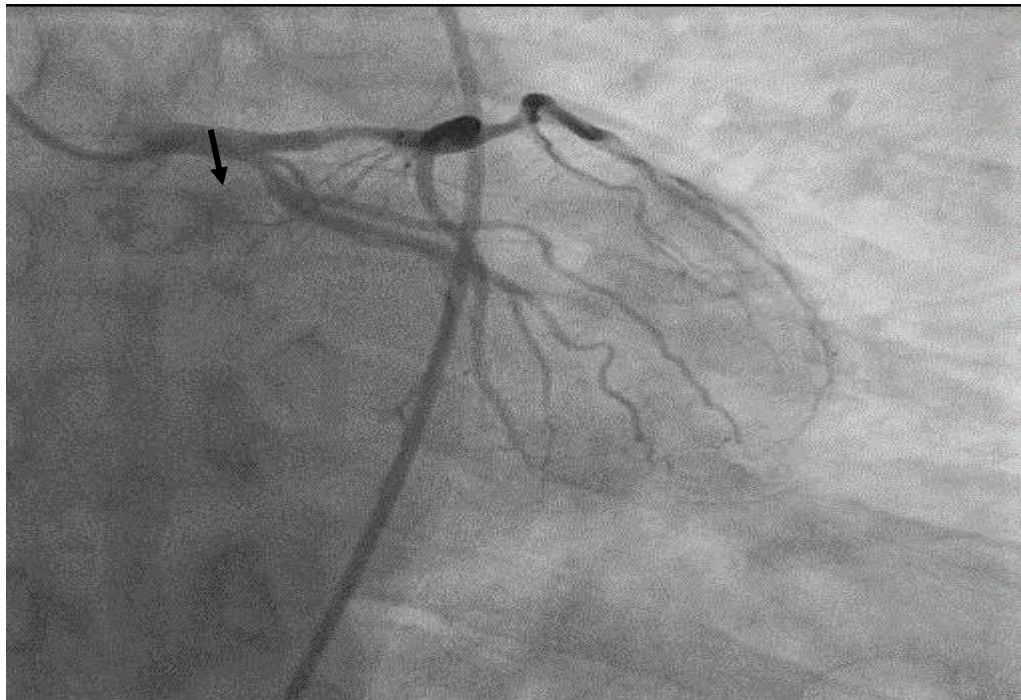
**Figure 2a:-** Stenosis of the proximal LAD coronary artery.



**Figure 2b:-** Stenosis of the proximal LAD coronary artery.

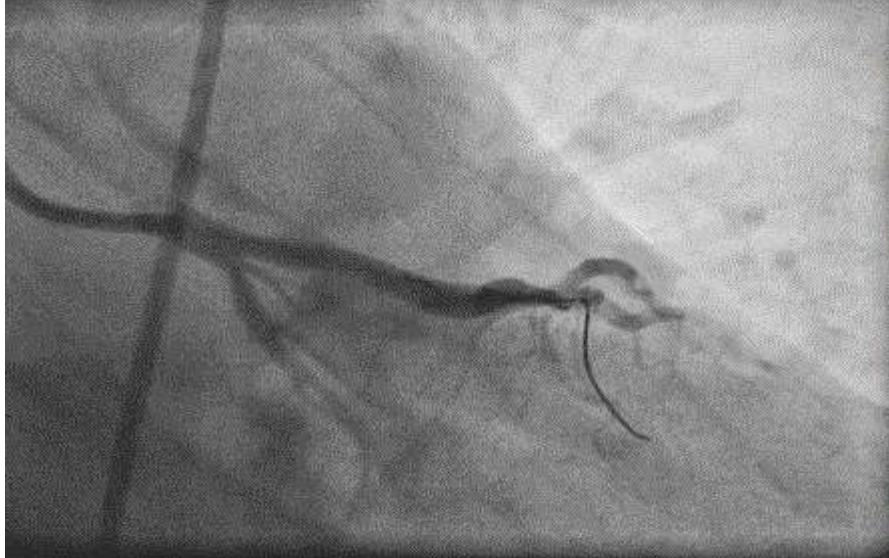


**Figure 2c:-** Right coronary artery with no abnormalities.



**Figure 2 d:-** Image showing the stenosis of the LAD coronary artery and the left circumflex coronary artery with no abnormalities.





**Figure 2c:-** TIMI 3 flow after treatment.

### **Discussion:-**

Electrocardiography (ECG) is the gold standard for early diagnosing STEMI. Moreover, the abnormalities found on the ECG are used to localize the anatomic site of the infarction and they are assumed to be correlated with coronary artery.

In a study conducted by Richard M. and al. about the electrocardiographic localization of coronary artery narrowings, Q waves correctly identified the location of the coronary disease in 98% of cases, ST elevation in 91%, T-wave inversion in 84%, ST-depression in 60%. (1,2)

Basically the occlusion of the LAD coronary artery is associated with an ST-elevation in the anterior leads. (3)

Though the occlusion or stenosis of the LAD coronary artery is more often associated with ECG changes in the anterior leads, some exceptions are described.

For instance, in a study carried out for a period of 2 years at Acharya Vinhoba Bhawe rural hospital, out of 55 patients presenting with anterior wall myocardial infarction or ischemia at the ECG, 3 had an occlusion or stenosis of the left circumflex coronary artery. (4)

An other unusual ECG pattern of the LAD coronary artery occlusion is found in « the wrap around LAD ».

When the LAD wraps around the left ventricular apex, its occlusion after its first diagonal branch appears with a combination of a transmural ischaemic myocardium in the anterobasal and anterolateral wall of a lesser degree together with transmural ischaemic myocardium in the inferior wall.

Inferior ST-elevation during acute anterior myocardial infarction is not usual but explainable when the “wrapped” LAD is occluded distal to its first diagonal branch, appearing with a combination of a transmural ischaemic myocardium in the anterobasal and anterolateral wall of a lesser degree together with transmural ischaemic myocardium in the inferior wall. The ECG findings show an ST-elevation both in the anterior and the inferior leads. (6)

This was first demonstrated by Sapin and al. in 1992. (7)

Bozboyoglu and al. recently demonstrated that a patient with inferior ST-elevation is more likely to have a wrap around LAD than a patient without inferior ST-elevation, and distal occlusion of LAD is more frequent in patients with inferior ST-elevation than those without. (8)

We are reporting a rare case of an infero-latero-basal STEMI suggesting an occlusion of the left circumflex coronary artery or the right coronary artery.

Nonetheless, the angiography performed showed a severe stenosis of the proximal LAD coronary artery with normal left circumflex coronary artery and right coronary artery.

The patient was revascularised by angioplasty with active stenting of the proximal LAD coronary artery and the post-coronary ECG showed electrical changes of revascularisation in the anterior leads confirming that the LAD coronary artery was the culprit artery.

The evolution was favourable without complications.

The particularity of our case lies in the fact that the stenosis concerns the proximal segment of the LAD coronary artery.

Such rare cases are found in the literature and more explanation is yet to be given. (6,9)

**Conclusion:-**

ST-elevation both in the anterior and inferior leads is a particular ECG pattern of the left anterior descending artery coronary.

The wrap around LAD coronary artery is the most common explanation of this ECG pattern.

However, there are rare exceptions to this rule that are yet to be explained.

In our case, there was an LAD proximal severe stenosis presenting as ST-segment elevation in the infero-latero-basal leads that suggested an occlusion of the right coronary artery or the left circumflex artery on the ECG; however, coronary angiography results demonstrated a subocclusion within the proximal part of LAD coronary artery.

**References:-**

- 1- [Gianaugusto Slavich](#) (2012) et al. Electrocardiographic identification of the culprit artery and occlusion site in ST-elevation myocardial infarction
- 2- RICHARD M. FUCHS (1982) et al., Electrocardiographic Localization of Coronary Artery Narrowings: Studies During Myocardial Ischemia and Infarction in Patients with One-vessel Disease
- 3- [Denny T Dyna](#), (2019) et al., Correlation between the diagnostic accuracy of the electrocardiogram and coronary angiography in localization of occluded artery in acute ST-elevation myocardial infarction: A single-center experience
- 4- Ayush P. Somani (2020) et al., Correlation of ECG Changes with Coronary Angiographic Findings in Patients of Coronary Artery Disease
- 5- [Rohit Prabha Gaude](#) (2018) et al., Study of coronary angiographic correlation with electrocardiography in patients of acute coronary syndrome-ST-elevation myocardial infarction
- 6- Marko Perčić (2020) et al. Clinical Paradox: Anterior Wall Myocardial Infarction with Predominant Inferior ST Elevation and No Variation in Coronary Anatomy in a PAI-1 Homozygote
- 7- [P M Sapin](#) (1992) et al., Implications of inferior ST-segment elevation accompanying anterior wall acute myocardial infarction for the angiographic morphology of the left anterior descending coronary artery morphology and site of occlusion
- 8- [Emrah Bozbeyoğlu](#) (2019) et al., Is the inferior ST-segment elevation in anterior myocardial infarction reliable in prediction of wrap-around left anterior descending artery occlusion?
- 9- [Hossein Sheibani](#) (2020) et al., Inferior ST-Segment Elevation Caused by Occlusion of Left Anterior Descending Artery.