

CASE REPORT

Myocardial infarction in a patient having Dextrocardia with situs inversus-a rare image

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ABSTRACT

Dextrocardia with situs inversus is a rare condition in which the major visceral organs are flipped from their normal positions. It becomes difficult to correctly interpret the territory for myocardial infarction on a standard electrocardiogram (ECG) if the diagnosis of dextrocardia is not known. Therefore findings need to be clearly identified and all limb and precordial leads

must be reversed to unveil the ECG changes. Here is a case of patient having dextrocardia with situs inversus who presented to emergency department with symptoms of myocardial infarction and acute left ventricular failure which was correctly identified on a right-sided ECG.

KEYWORDS

Dextrocardia; Situs inversus, Right side ECG

INTRODUCTION

Dextrocardia with situs inversus is a rare condition in which the major visceral organs are flipped from their normal positions. It becomes difficult to correctly interpret the territory for myocardial infarction on a standard electrocardiogram (ECG) if the diagnosis of dextrocardia is not known.⁽¹⁾ Therefore findings need to be identified and all limb and precordial leads must be reversed to unveil the ECG changes.⁽²⁾ The cause of dextrocardia is also unknown. However, it may be associated with a variety of factors like autosomal recessive gene inheritance, maternal diabetes mellitus, cocaine use, and conjoined twinning.⁽³⁾

Here is a case of a patient having dextrocardia with situs inversus who presented to the emergency department with symptoms of myocardial infarction and acute left ventricular failure.

CASE PRESENTATION

A 50-year-old male with no previous known comorbidities presented to the emergency department with a history of chest pain for two days and dyspnoea for one day. With a preliminary diagnosis of myocardial infarction patient's ECG was performed which showed the following features:

- 1) Right-axis deviation
- 2) Positive QRS complexes (with upright P and T waves) in aVR
- 3) Lead I and aVL: Inversion of all complexes, aka 'global negativity' (inverted P waves, negative QRS complexes, inverted T waves)
- 4) Progressive decline in the amplitude of QRS complexes in precordial leads, representing a poor progression of R wave. (Fig 1).

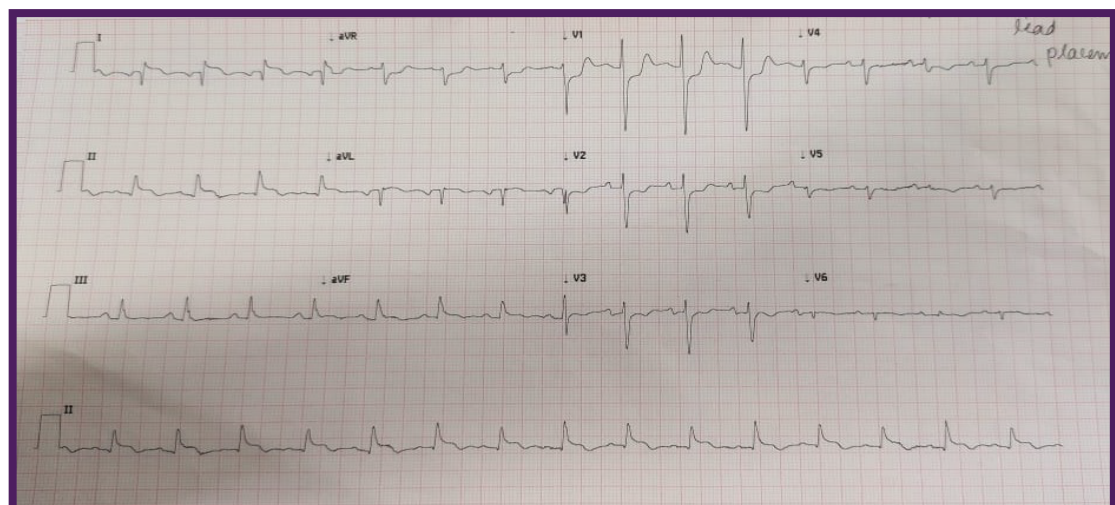


Figure 1. ECG changes with normal lead placement

These findings represent dextrocardia.⁽⁴⁾

The precordial leads were then placed in a mirror-image position on the right side of the chest and the left and right arm electrodes were reversed. ECG was taken again which demonstrated

- 1) A normal axis
- 2) Negative QRS complexes (a negative P and T wave) in lead aVR

3) Positive QRS complexes in leads I and aVL with upright P and T waves

4) Normal progression of R waves in precordial leads.

Other specific findings were ST-segment elevations in lead II and aVF portraying inferior wall MI with ST depression and an upright T wave in V2 and V3 possibly due to associated posterior wall MI (Fig 2).

Chest radiograph confirmed dextrocardia (Fig 3)

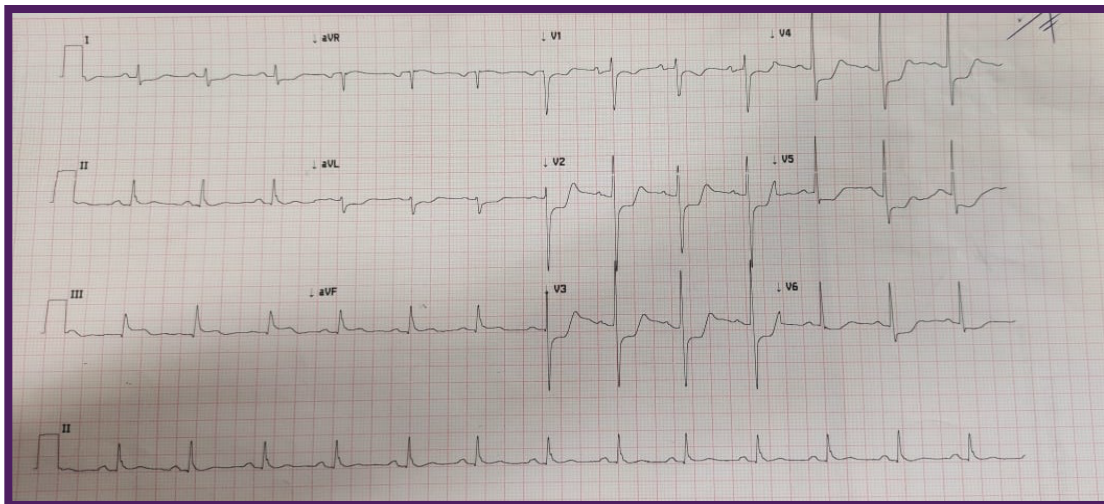


Figure 2. ECG changes with right sided lead placement

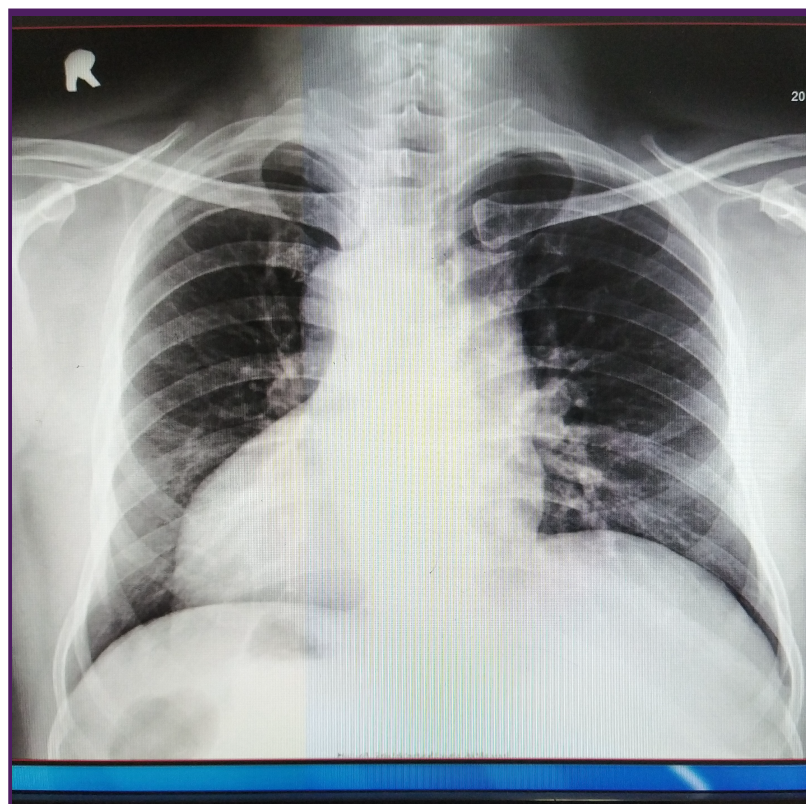


Figure 3. Chest X-ray showing dextrocardia

An echocardiogram was performed which showed infer posterior wall motion abnormality with reduced ejection fraction.

Cardiac catheterization was done immediately which showed thrombosis in the Posterior Lateral branch of the Right Coronary Artery which was ballooned and stented.

DISCUSSION

Although ECG provides basic knowledge, yet it is a very simple and non-invasive tool in diagnosing dextrocardia with situs inversus. And can be helpful in low resource areas. A study done in Nigeria reported a case of a 22-year-old man who presented himself for a preadmission medical test. His standard 12-lead ECG revealed uncommon features and later on diagnosis of dextrocardia was made.⁽⁵⁾ Another study conducted in India encompasses the role of ECG in diagnosing Myocardial infarction in a patient with dextrocardia. ECG took after reversing limb and precordial leads revealed widespread ST elevation in leads I, aVL, and V1 to V6 suggestive of acute extensive anterior wall MI. Later on, cardiac catheterization done showed thrombotic occlusion in the mid-Left anterior descending artery as depicted in the ECG.⁽¹⁾ The same was true for our case, the routine ECG represented dextrocardia, but the reversed ECG exactly showed infer posterior myocardial infarction as later on established on angiography. Another study states that ST-segment elevation myocardial infarction in a patient with dextrocardia is an extremely rare finding, with <100 cases ever reported worldwide, and the diagnosis can be easily missed considering it a technical error.⁽⁶⁾ So one must be aware of ECG findings of dextrocardia and should always confirm this by auscultating the chest. Chest radiographs can also be immediately performed if there is doubt.

CONCLUSION

Situs Inversus with dextrocardia is both a clinical and

diagnostic challenge for emergency physicians to properly identify the acute coronary syndrome. In such patients rapid application of a reversed electrocardiogram results in prompt diagnosis of ST-segment elevation myocardial infarction, timely management, and activation of the cardiac catheterization laboratory.⁽⁷⁾

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