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## Case report of myocardial infarction in a septuagenarian with Situs Inversus Totalis

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### Abstract

Dextrocardia with situs inversus, commonly known as mirror-image dextrocardia, is a rare congenital malposition of the heart where the cardiac apex is oriented to the right side and involves complete transposition (right to left reversal) of all of the viscera.

We present to you a case of 75 year old female with dextrocardia and situs inversus, who had presented with STEMI and was successfully managed with PCI.

**Keywords:** dextrocardia, situs inversus, myocardial infarction, STEMI

### Introduction

The term *situs*, derived from Latin, means position. Situs classification or body situs is of 3 types: - Situs solitus – the normal position of thoracic and abdominal viscera; Situs Inversus – inversal of the normal position of visceral organs; and Situs Ambigus – intermediate position with duplication<sup>[1, 2]</sup>. In situs inversus, the morphological left atrium is on right and the morphological right atrium is on left. The left lung has 3 lobes, while the right lung has 2 lobes. Liver and gallbladder are on left, while spleen and stomach are on right side<sup>[3]</sup>.

The first case of Situs Inversus was reported by Matthew Baillie in 17<sup>th</sup> century. Situs inversus is of 2 types – Situs Inversus with levocardia; and Situs Inversus with dextrocardia. Levocardia and dextrocardia imply the position of cardiac apex at time of birth. Isolated dextrocardia is termed as Situs Solitus with dextrocardia. Situs Inversus with dextrocardia is termed as Situs Inversus Totalis, as the cardiac apex, cardiac chamber and visceral organs, all are on the mirroring side.

Situs Inversus Totalis has an incidence of 1 in 8000 births, explaining the rarity of the condition<sup>[4]</sup>, the incidence of congenital heart disease in Situs Inversus Totalis is 3 – 5% , the most common being transposition of the great vessels. 80% have a right-sided aortic arch<sup>[5]</sup>. However, most of the patients remain asymptomatic and the condition comes to light upon investigating other conditions or as an incidental finding.

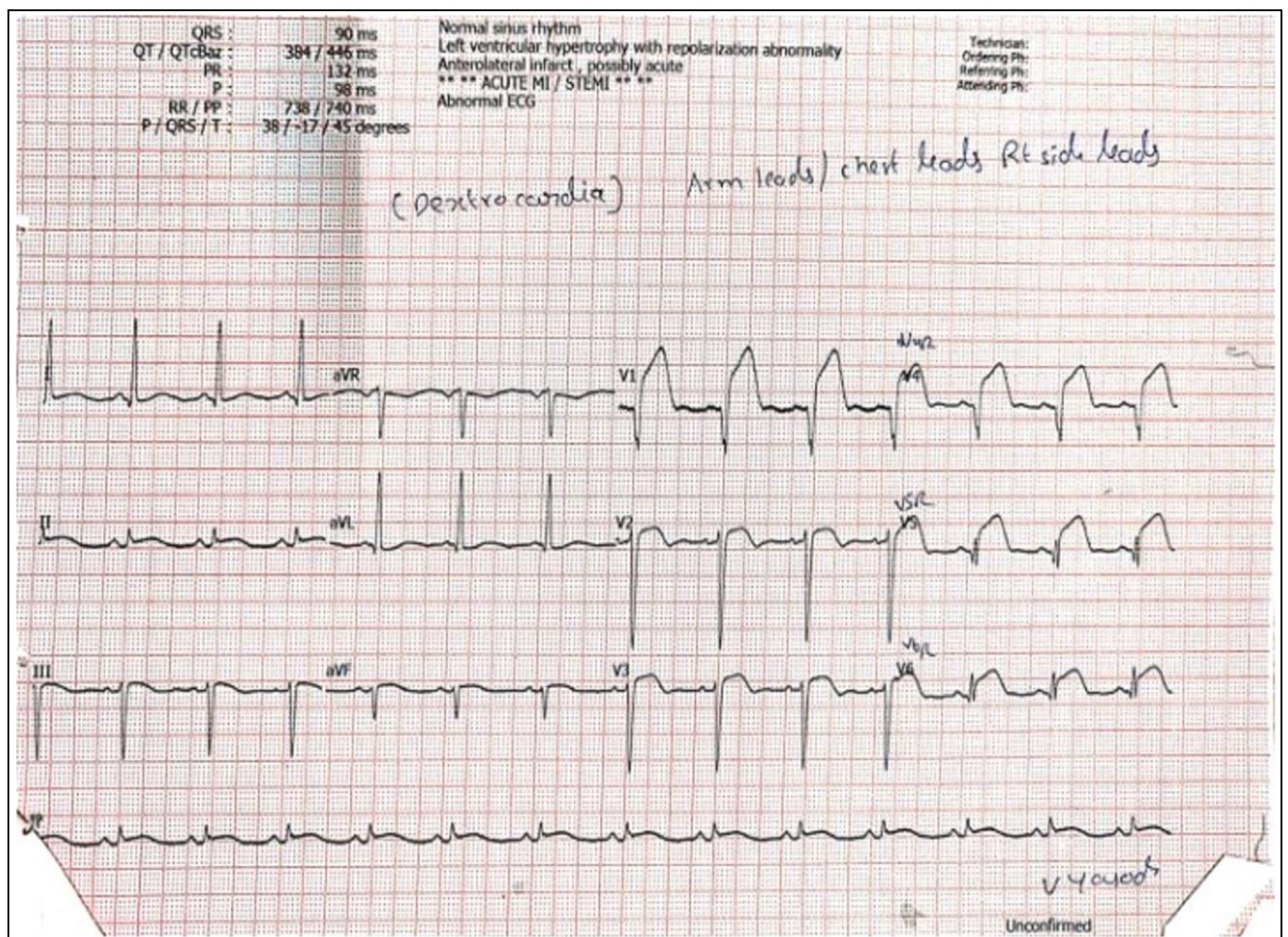
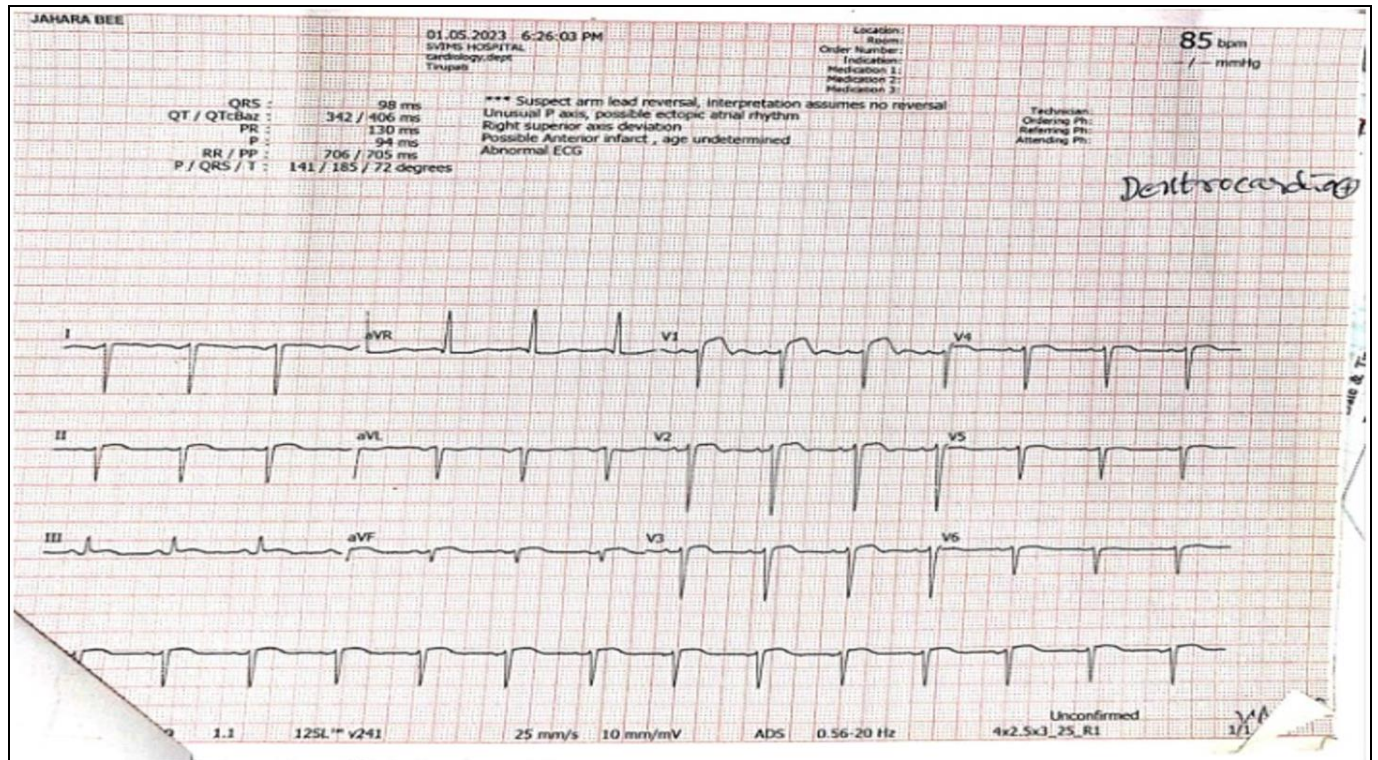
The incidence of atherosclerotic coronary artery disease (CAD) in these patients is presumed to be the same as that of the general population. Patients with dextrocardia pose a diagnostic challenge, especially in the setting of acute coronary syndrome. Clinical and electrocardiographic features and approaches to the coronary angiogram and percutaneous coronary intervention (PCI) differ.

We herein describe the technical details of successful PCI in a case of dextrocardia with situs in versus.

### Case report

A 75 year old female presented with complaints of chest pain and dyspnea of 5 days duration, to the casualty, NRI Medical College and hospital, Mangalgiri. She is hypertensive since few years and is compliant with her antihypertensive medications. On general physical examination, her pulse rate was 96 bpm and blood pressure was 120/70 mmHg. On cardiovascular examination, apex was found on the right side with normal S1 and S2 on auscultation. Electrocardiography (ECG) had inverted P-waves in leads I and aVL, upright P-wave with prominent R-wave in aVR, and prominent S-wave in the left precordial leads, which were suggestive of dextrocardia. There was no evidence of QRS transition in the precordial leads. There were ST elevations in the V1R-V6R, suggestive of STEMI.

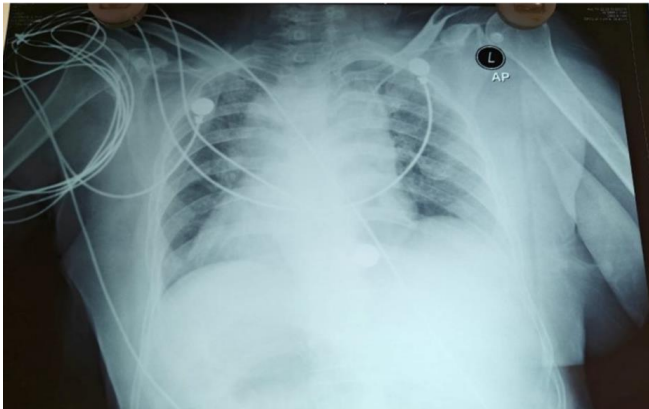
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Her Troponin I levels were 5.5 ng/ml, which is more than 100 times the normal value (0.03ng/ml). Chest radiograph showed dextrocardia with normal cardiac size. Stomach bubble was seen on the right side. Ultrasound abdomen

(done on the 2<sup>nd</sup> day of admission) showed inversion of abdominal viscera with the liver on the left side and the spleen on the right side confirming the diagnosis of dextrocardia with situs inversus.

Chest Radiograph showed dextrocardia with normal cardiac size. Stomach bubble was seen on the right side



Her Hemoglobin was 11.5 g %, renal parameters, serum electrolytes were within normal limits.

The patient was taken up for coronary angiography through the right femoral artery approach. Selective coronary angiography with 6F Judkins left catheter (JL 3.5) and Judkins right catheter (JR 3.5) was done. The angiography findings were as follows – LAD-Proximal LAD has mild disease, mid LAD has significant stenosis and distal LAD is normal; LCX: Dominant and normal; RCA: Non dominant and normal.

Patient was counselled regarding the need for undergoing PTCA. After taking informed consent regarding procedure, pt was taken up for PTCA. Right anterior oblique (RAO) view was used for identifying and engaging the coronaries. LCA was engaged with JL 3.5 guide catheter. Choice floppy wire (0.014x182 cm) was used to cross the lesion. Pre-dilatation was done with 2.5 x 12 mm TRAVELER balloon (Abbott) was done. It was followed by deployment of everolimus-eluting stent (PRISTINE) size 3.0 mm x 15 mm. TIMI-III flow was achieved through and beyond stent with no residual stenosis.

Post procedure period was uneventful. Patient was explained regarding her congenital abnormality and her fear were allayed. The patient was discharged after 3 days.

### Discussion

Dextrocardia is a genetic defect wherein the position of cardiac apex is mirrored onto the right side. Situs Inversus Totalis is a rare condition with complete inversion of thoracic and abdominal organs. Congenital heart diseases commonly associated with Situs Inversus Totalis are ventricular septal defect, Tetralogy of Fallot, Pulmonary atresia, Complete AV septal defect, and OS ASD. Generally patients with dextrocardia have a normal life expectancy unless it is associated with other structural heart diseases.

Patients are mostly asymptomatic and found upon regular investigations. Emmanuel *et al.* [8] reported a 59yr old police officer who presented with symptoms of dysuria, increased frequency and urgency of micturition. Upon routine ultrasonography and chest x-ray, he was found to have Situs Inversus Totalis.

Jain *et al.* [6] performed PCI on a 33yr old patient with Situs Inversus Totalis who presented with acute STEMI. They performed PCI using a transfemoral approach reverse torquing of the catheter to engage the coronaries. The procedure was performed via postero-anterior (PA) projection and avoided left anterior oblique (LAO) and right

anterior oblique (RAO) projections thereby eliminating the need to swap views. Celik *et al.* [7] also had a similar presentation in 32yr old patient.

Treating a patient with situs inversus totalis is extremely challenging. Knowledge of altered anatomy is imperative while performing PCI.

### Conclusion

Appropriate identification of this condition and treatment of its complications will aid in the longevity of patients with Situs Inversus Totalis.

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