

Myocardial perfusion scintigraphy in a case of dextrocardia: Doing it “right”

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ABSTRACT We present the challenges in performing the stress test and acquisition of images in myocardial scintigraphy in a 54-year-old female patient with dextrocardia. Dextrocardia and situs inversus were documented on prior investigations including a chest roentgenogram and sonography.

Keywords: Dextrocardia, situs inversus, SPECT, Tc99m-tetrofosmin

INTRODUCTION

Dextrocardia is a rare congenital abnormality with incidence of 0.01% of live births.^[1] The heart is positioned in the right hemithorax in this condition unlike the normal left sided position. Performance of myocardial perfusion imaging (MPI) to acquire optimal images can be challenging in this condition. We describe the intricacies and pitfalls in one such case of dextrocardia.

CASE REPORT

A 54-year-old type 2 diabetic and hypertensive female patient with dextrocardia and situs inversus was referred for evaluation of coronary artery disease. The patient underwent treadmill test with Bruce protocol. The electrocardiogram with the leads placed conventionally [Figure 1a] shows *P* inversion in the lead I inverted QRS complexes in lead I with right axis deviation and equivocal and non-progressive R waves in the precordial leads. Reversal of the leads shows upright *P* and QRS in lead I with normal QRS progression in chest leads [Figure 1b]. Chest X-ray also showed cardiac shadow on the right side [Figure 1c]. At the peak stress, Tc99m-tetrofosmin (370MBq) was injected. Following the stress, tomographic imaging was carried out

under a dual head gamma camera (Infinia hawkeye-4, General Electricals, Milwaukee, USA) with a low dose computed tomography (140 mV, 2 mA) for attenuation correction. Images were acquired in L mode over 180° starting from right posterior oblique to left anterior oblique projections instead of the standard right anterior oblique to left posterior oblique views. Rest images were acquired on the same day after reinjection of tracer. The images show findings of situs inversus and dextrocardia [Figure 1d]. Reversible perfusion defect was also noticed in the free wall (antero-lateral segment as per conventional nomenclature). Attenuation correction in this case shows the severity and extent of defect to be less as compared to uncorrected images suggesting an attenuation artefact [Figure 1e].

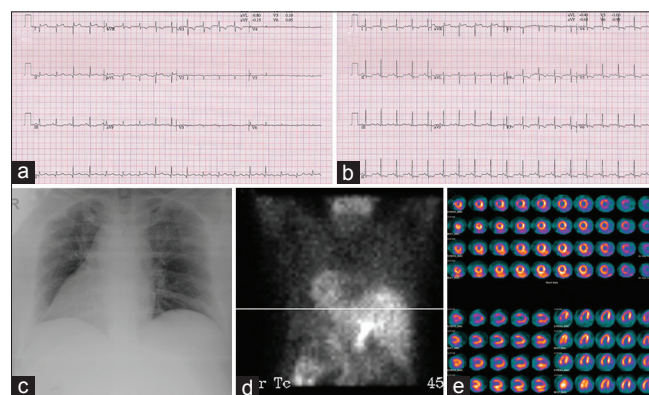


Figure 1: Features of dextrocardia (a) electrocardiography (ECG) of the patient with the leads placed conventionally showing *P* wave and QRS inversion in lead I and non-progression of QRS complex in precordial leads (b) ECG of the same patient with the placement of leads reversed (c) chest X-ray of the patient showing dextrocardia (d) maximum intensity projection of the patient showing dextrocardia with situs inversus and (e) SPECT images showing reversible perfusion defect in the antero-lateral segment of the patient.

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DISCUSSION

Dextrocardia is a rare congenital abnormality with incidence of 0.01% of live births.^[1] The term mirror image dextrocardia is used in case of dextrocardia with normal vascular connections along with situs inversus. Few reports of MPI in a patient with dextrocardia exist.^[2-5] In their review, Burrell and MacDonald^[6] suggest acquisition of images from -135° to $+45^{\circ}$ position. We have acquired from -45° to $+135^{\circ}$. Similar acquisition has also been carried out by Turgut *et al.*^[4] and therefore, also gives effective results. Due to the rare incidence of this anomaly, it is difficult to exactly demonstrate, which method of acquisition is better. Situs inversus may also be seen in association with Kartagener syndrome. Kartagener syndrome is a disorder of ciliary motility and presents with recurrent sinusitis, otitis media, bronchiectasis and situs inversus.^[7] The index patient had isolated dextrocardia with situs inversus without Kartagener syndrome. It is necessary for both the technologist and physician to be aware of dextrocardia and note the “right way” of acquisition of electrocardiography and single photon emission computed tomography images.

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