



Visual Case Discussion

Mirror image dextrocardia with situs inversus!

Abhijit S. Nair*, Asiel Christopher, Basanth Kumar Rayani

Department of Anaesthesiology, Basavatarakam Indo-American Cancer Hospital and Research Institute, Road No. 10, Banjara Hills, Hyderabad, Telangana, India



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During pre-anaesthesia evaluation of an 18 year old boy for palatoplasty, we encountered his postero-anterior view chest radiograph in which the cardiac shadow was seen in the right hemithorax (Image 1). The gastric bubble was also seen on the right side. The boy was asymptomatic and was physically active with no dyspnea on exertion. His resting heart rate was 80 beats per minute and his blood pressure was 124/80 mm of mercury. His heart sounds were audible on auscultation on right side and the apical impulse was also palpable on the right. We requested a 12 lead electrocardiogram (12 lead ECG) to evaluate any conduction abnormalities, a 2-dimensional echocardiogram (2D ECHO) to know biventricular function and presence of any structural abnormalities and an ultrasonography(USG) of abdomen to know whether the dextrocardia is associated with situs inversus.

12 lead ECG with standard lead placement revealed inverted T waves in lead I and aVL, deep S wave in lead I, tall R wave in V1, a reversed R wave progression from V1 to V6 leads and flattened T waves in V4-V6 (Image 2). We requested a 12 lead ECG with reverse lead placement. The findings were RSR in lead V1, right axis deviation with left ventricular hypertrophy by voltage which was normal for his age (Image 3). The 2D ECHO findings showed normal biventricular function with an ejection fraction of 60%, no septal defects, no regional wall motion abnormalities and no pericardial effusion. The USG findings were consistent with situs inversus (liver and gall bladder on left side and stomach, spleen on right side).

Dextrocardia is the presence of heart in the right hemithorax which is not due to extracardiac abnormalities. Cardiac dextroposition is due

to displacement of heart to the right secondary to conditions like hypoplastic lung, post right pneumonectomy or a diaphragmatic hernia. In cardiac dextroversion, there is abnormal rotation of the apex of the heart. This is usually associated with conditions like septal defects, anomalous venous return, tetralogy of fallot, coarctation of aorta, pulmonary stenosis.¹

Dextrocardia is of several types. In situs solitus, the dextrocardia is associated with normal orientation of great arteries. In situs inversus, the great vessels are usually inversely placed in the thoracic cavity. In situs ambiguous where there is asplenia or polysplenia, the presence and origin of great vessels from ventricles are variable.² Isolated dextrocardia is usually associated with other malformations of heart like septal defects, single outlet ventricles or tricuspid atresia. Mirror image dextrocardia with situs inversus is when the heart and the abdominal organs are placed in opposite side.³ To know this is important so as to diagnose and treat abdominal pathologies. Kartagener's syndrome is found in 25% patients with mirror image dextrocardia with situs inversus. In this syndrome, there is a triad of situs inversus, paranasal sinusitis and bronchiectasis.

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.visj.2017.04.018](https://doi.org/10.1016/j.visj.2017.04.018).

* Corresponding author.

E-mail address: abhijitnair95@gmail.com (A.S. Nair).

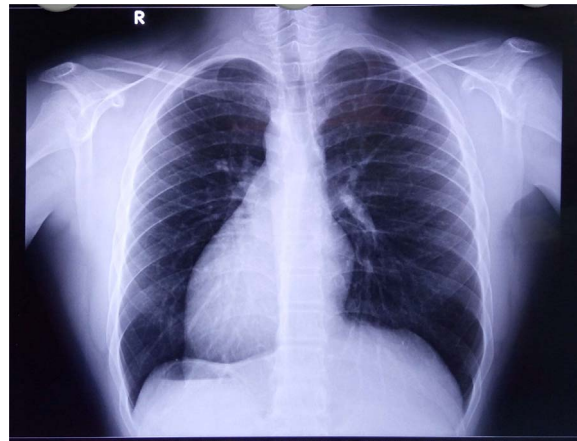


Image 1. The PA view chest radiograph shows heart shadow in right hemithorax along with gastric bubble on the right side.

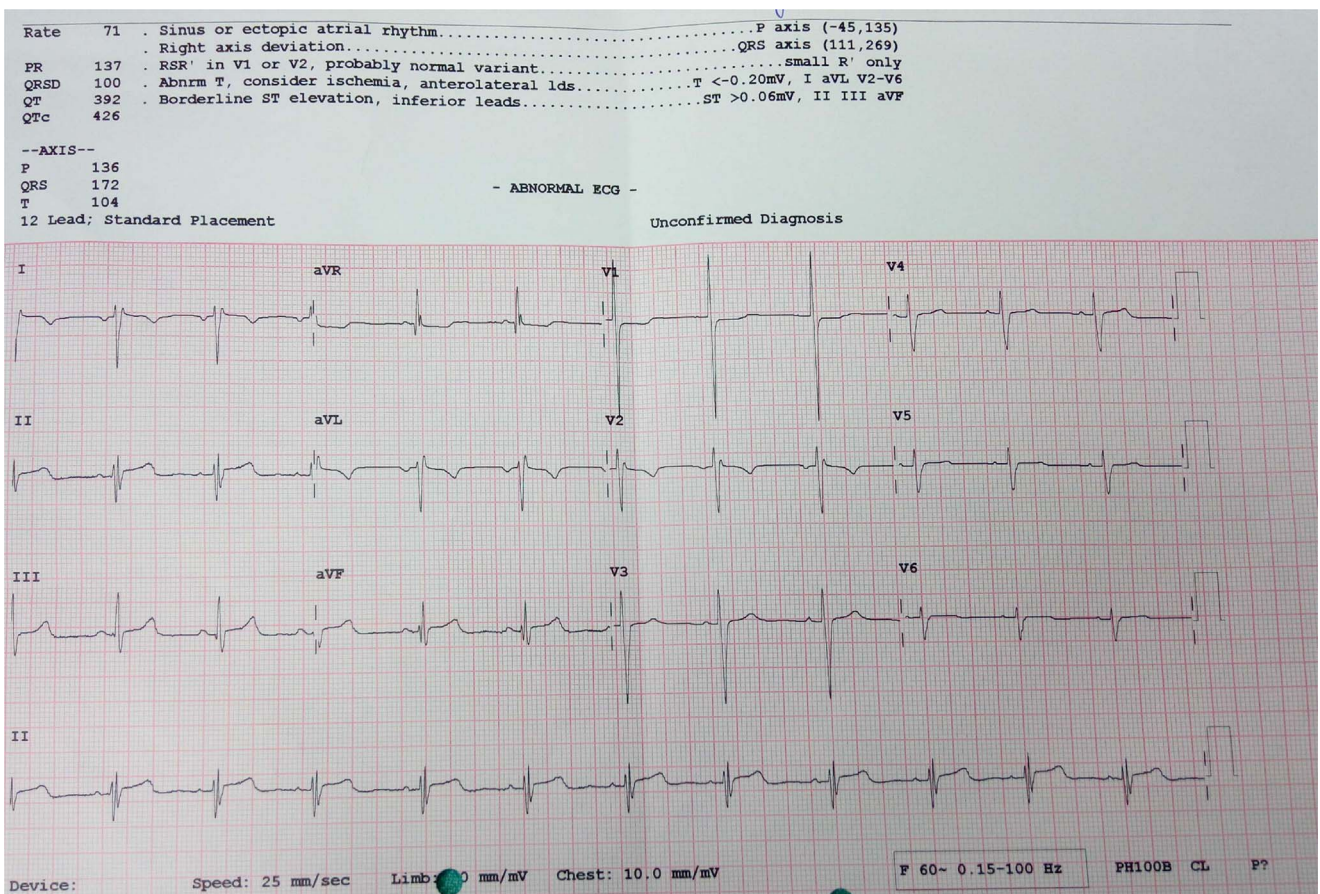


Image 2. A 12 lead ECG with normal lead placement shows abnormalities in lead I, aVL and V1-V6 not consistent with an 18 yr old asymptomatic patient.

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