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Clinical Case

Dextroposition: Cardiac Malposition on Mass Effect

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Abstract

The heart is located in the anterior mediastinum, between the two lungs, retrosternal in front of the esophagus, whose tip is directed to the left. There may be anomalies of congenital or acquired malpositions. In the latter, it is reported cardiac ectopia in the thorax after a mass effect or hypoplasia of one of the lungs. We report the clinical case of a patient with cardiac dextroposition by mass effect of fortuitous discovery following respiratory distress related to a chronic pulmonary pathology.

Keywords: Dextroposition; Cardiac Malposition; Left Emphysema

Clinical Case

39-year-old patient admitted to medical intensive care for respiratory distress. She is being followed for pulmonary mediastino sarcoidosis. In an emergency, the CT-scanner revealed a voluminous bubble of emphysema of the left upper lobe of 175x170mm realizing a significant mass effect on the left lower lobe, on the mediastinum with significant deviation of the mediastinal structures on the contralateral side (Figure 1). Auscultatory silence at the conventional cardiac foci on the left, heart sounds perceived on the right on the 2nd and 3rd intercostal spaces with positive Carvalho's sign. On his electrocardiogram, the axis is in place with a positive P wave in DI, negative aspect of QRS in aVR and abrasion of R in anteroseptoapical ((Figure 2, 3).

The performance of the thansthoracic echocardiography (TTE) was difficult to perform, all the more so no cardiac image appears with the probe on the conventional foci in the subcostal and in the left precordial. We perform TTE on the right (image 4 to 10) in situs solitus, levocardia, good atrioventricular and ventriculoarterial concordance, without congenital structural anomaly, with remodeling of the right cavities on high probability of pulmonary hypertension (PH). Reconstruction of the sagittal CT-scan image (image 11) describes an emphysema bulla entirely occupying the left hemithorax deflecting the mediastinum organs to the right (trachea, bronchi and heart) with diffuse fibrosing interstitial involvement.

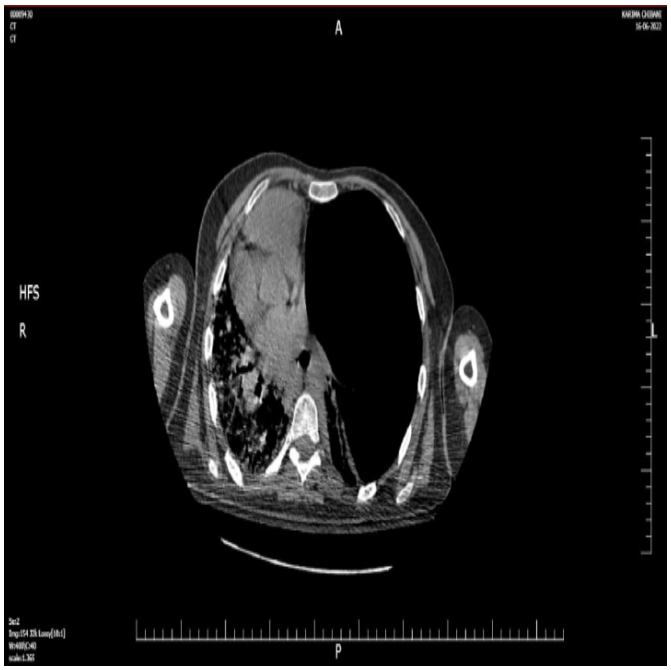

Figure 1: *Chest CT-scan, compressive left emphysematous bulla.*

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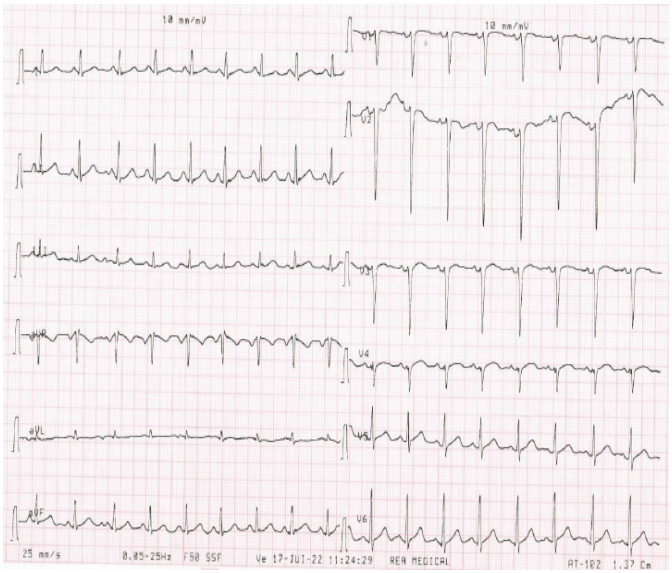

Figure 2: *Heart axis in place, positive P wave in DI, negative QRS in aVR.*

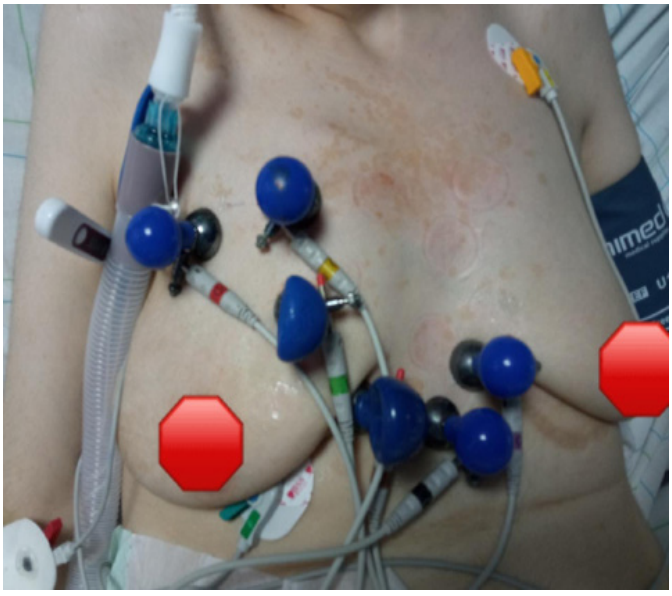

Figure 3: *Precordial electrodes placed next to the location of the heart on the right following Dextroposition.*

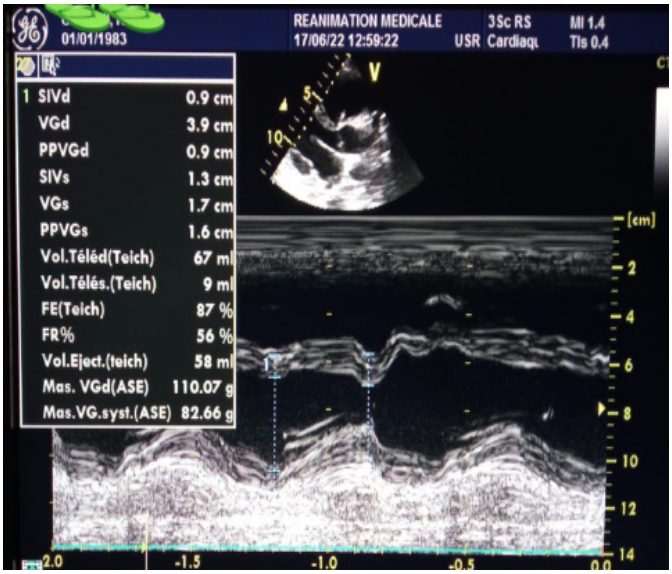

Figure 4: *long-axis slice taken at the 2nd right EIC on the mid-clavicular line showing in TM mode a straight septum and a paradoxical septum in TV systolic.*

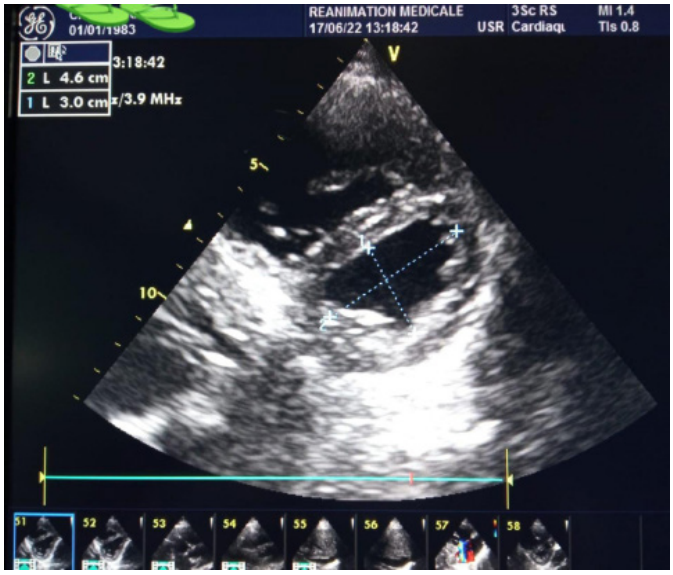

Figure 5: *Short-axis slice taken at the 2nd right EIC on the mid-clavicular line showing in 2D mode a dilated right ventricle and a flat septum in diastole.*

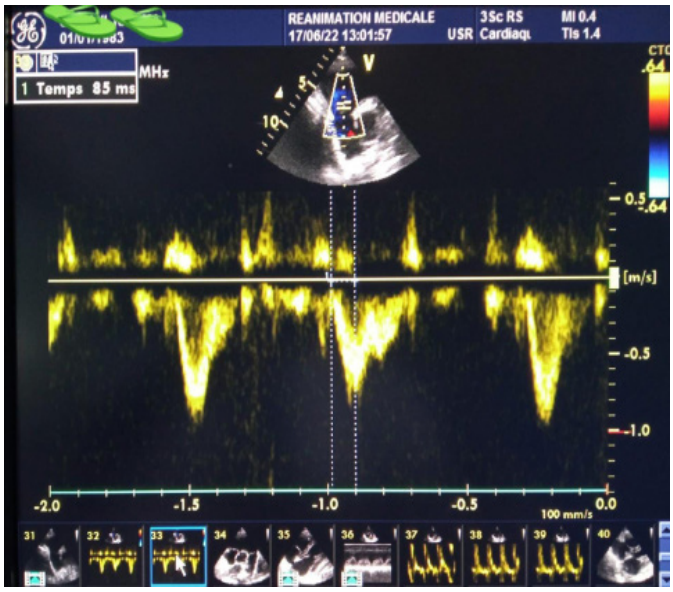

Figure 6: *Pulsed doppler, a collapsed TAC and a Notch aspect.*

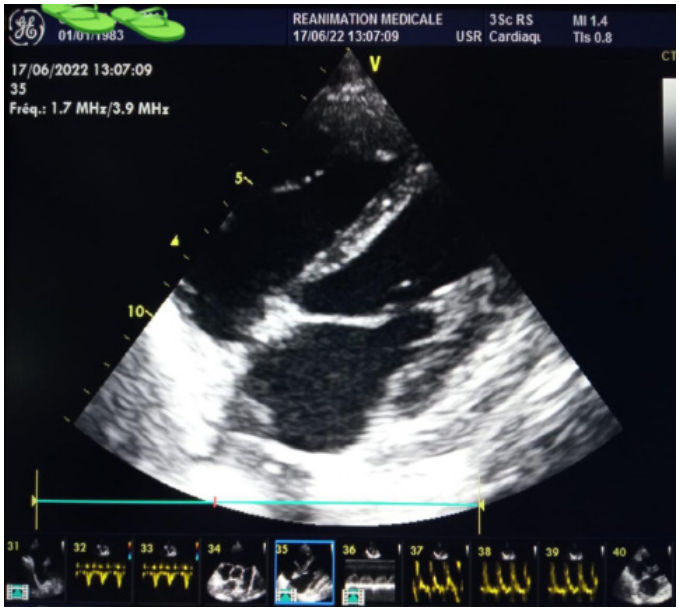

Figure 7: *4-Cavity section performed at the 3rd EIC in right parasternal in 2D mode, LV apex not well cleared because retrosternal.*

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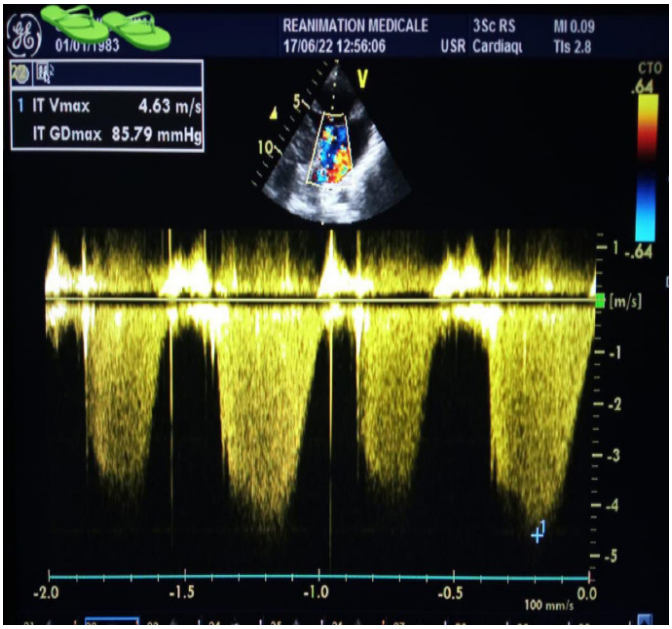

Figure 8: *Tricuspid insufficiency with high velocity giving a gradient of 106mmHg for a dilated IVC that is not very compliant, modified long axis slice taken at the 2nd right EIC on the mid-clavicular line.*

Figure 9: *Heart probe on the patient's right hemithorax, oriented towards the right shoulder to visualize the left ventricle on its long axis.*

Figure 10: *Heart probe on the patient's right hemithorax, oriented towards the left shoulder to visualize the right ventricles and left ventricle on its short axis, clear the 4, 5 and 3-cavity cuts.*

Figure 11: *Reconstructed CT-scan image, voluminous bubble of compressive emphysema entirely occupying the left hemithorax.*

Discussion

Dextroposition is defined simply by a displacement of the heart to the right. He is either attracted by an isolated right pulmonary hypoplasia or integrated in a scimitar syndrome, or pushed towards the right by a bubble or a left emphysema. The latter illustrates the clinical case of our patient [1,2].

Not to be confused with dextrocardia or dextroversion in which most often the heart is in a normal position, the apex of the heart is simply turned to the right 1. This is an abnormal congenita, which can be associated with a situs inversus (the right atrium receiving the vena cava is located to the left of the atrium receiving the pulmonary veins1) as in Kartagener's syndrome [3,4]. Situs inversus next to which we also speak of heterotaxy when the thoracic and abdominal organs are not in their usual place with a discordant thoracic and abdominal situs [1].

These abnormalities can be distinguished on a standard electrical tracing, and be diagnosed and differentiated on imaging. Unlike, only Dextroposition does not modify the axis, the P wave is always positive in DI. Our electrical tracing (Figure 2), on its own, would not have made us suspect this diagnosis. As for the imaging, radiography and reconstructed thoracic CT-scan (Figure 11), his right lung being completely affected by fibrosis, were of no use in specifying the direction of the apex of the heart. Only the TTE (Figure 4-10) made it possible to objectify the heart on the right, where we made as best we could the major axis, minor axis, and 4 cavities sections between the 3rd and 4th intercostal space, and described their different situations including an apex oriented to the left (levocardia) .

As for her development, she could not be a candidate for general anesthesia, so she was refused surgery. She will therefore be transferred to the pulmonology department for further care.

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