Lincoln-Danielson Heart: First reported 3D reconstructed case

and a review of literature about one of the rarest hearts in paediatric cardiology

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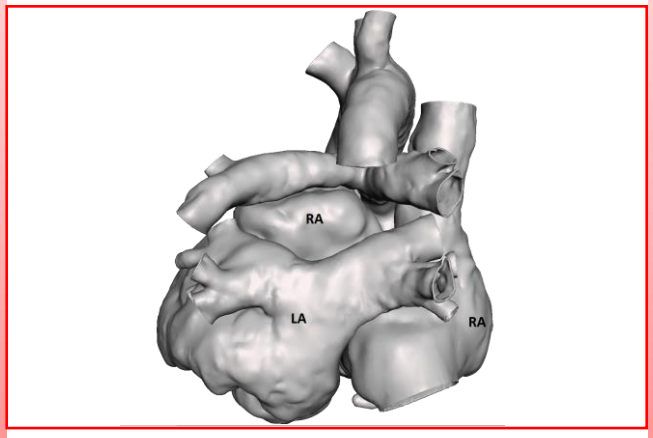
Introduction

The so-called Lincoln-Danielson heart is an extremely rare congenital heart disease characterized by the presence of a double outlet right ventricle with L-malposition of the great arteries. Due to its rarity, its main features and possible surgical treatments are often overlooked by textbook and relevant literature. A 3D model was created from a CT scan acquisition of one of our patients and rendered using CAD software. We then identified a total of 50 other published cases from 1892 to 2013 and we described the differences and the similarities between all of them.

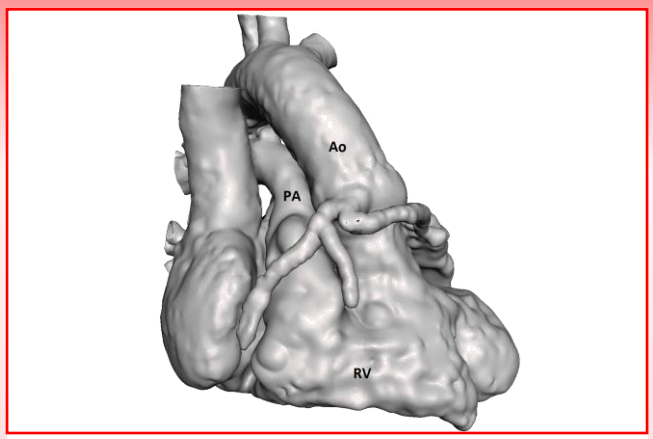


Rear view

LA: Left Atrium; RA: Right Atrium

Take home messages

Double outlet right ventricle with L-malposition of the great arteries is a unique heart defect with an excellent prognosis in most cases, is associated with left juxtaposition of the atrial appendages and can coexist with any type of ventricular septal defect. The main predictor of surgical treatment is the type of VSD, the ventricular dimensions and the presence of pulmonary stenosis.

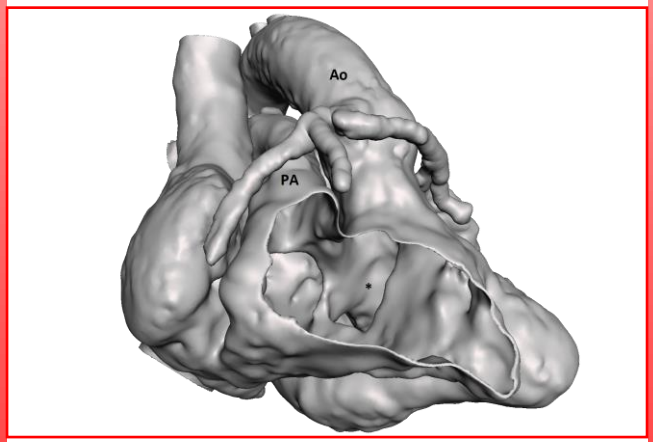


Front view

Ao: Aorta; PA: Pulmonary Artery;
RV: Right Ventricle

Case Description

The visceroatrial situs is solitus. The systemic and pulmonary venous returns are normal. The right atrial appendage is quite large and is left juxtaposed, touching the left one. Normal atrioventricular (AV) alignment is present. A posterior muscular VSD is present, extended to the subaortic region. Multiple medio-apical muscular VSD are also present. The right ventricle is hypertrophic and both great arteries originate from it. The aorta lies to the left of the pulmonary artery, which is hypoplastic. The left main coronary artery is abnormal, as it originates from the right coronary sinus together with the right coronary artery, albeit with a separate ostium.



Key Image

Ao: Aorta; PA: Pulmonary Artery;
*: Ventricular Septal Defect