Conversion from dextrocardia to levocardia for Rastelli operation in a patient with truncus arteriosus, double aortic arch and dextrocardia

Objective
To describe the surgical techniques for conversion the patients with dextrocardia to levocardia.

Case Video summary
The infant patient was diagnosed as situs solitus dextrocardia, atrial-ventricular concordance, truncus arteriosus type I, right dominant double aortic arch. The trachea was severely compressed. The patient received a palliative surgery in another hospital by separate the main pulmonary artery from the common arterial trunk and a BT shunt from the left subclavian artery.
She was referred to our hospital at the age of 4 months old. The main pulmonary artery was located left sided, while the dextrocardia caused the right ventricle to be located on the right posterior aspect. So the connection between the right ventricle and the pulmonary artery became very difficult.

To overcome the difficulty, we decide to convert the dextrocardia to levocardia as the first step. The surgery was performed with standard cardiopulmonary bypass with bi-caval cannulation. To rotate the heart to left side, the right atriotomy was made and the SVC and IVC orifice was left in-situ untwisted. The right atrial wall was reconstructed with fresh pericardial patch to make a larger right atrium. The heart was rotated to left side, and the aorta was transected to relief the twisting effect. The aorta was re-anastomosed after aligning the new heart orientation.
For the double aortic arch, the aberrant left subclavian artery was transected from descending aorta and reconnect to left common carotid artery, making the right arch with mirror image configuration.

After surgery, the image confirmed the levocardia was achieved. The Rastelli operation was performed two months later, using the hand-made 16 mm Gortex 3-cuspid valved conduit. The patient recovered well after surgery. She was followed up for 2.5 years without need of oxygen or respiratory support.

Conclusion:
Our surgical procedure successfully converted dextrocardia to levocardia in a patient with truncus arteriosus. The technique included the right atrial free wall patch augmentation and transection and anastomosis of aorta after rotation of the heart. After apical switch operation, the Rastelli operation could be performed as usual.

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