

**D-Transposition of the Great Arteries and Intact Ventricular Septum: morphological and functional echocardiographic pattern in newborns before the surgical correction**

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Objectives: To describe morphological and functional pattern in newborn with D-Transposition of the Great Arteries and intact ventricular septum (IVS/D-TGA) before surgery, and to analyze the differences in the group with pulmonary hypertension (PHT).

Methods: Anthropometric, clinical and echocardiographic data were obtained in 17 newborns with IVS/D-TGA. 40 body-surface matched-controls were selected. Patients were divided in two groups, PHT(2) and no-PHT(15). Cardiac morphologic and biventricular function were assessed after 48 hours of life (before the correction surgery) by 2D-Echo, M-mode, pulse-wave and Tissue-Doppler-Imaging techniques.

Results: PHT patients(2) had desaturation that required oxygen therapy with conventional-mechanical-ventilation and nitric-oxide. The other 15 had pulmonary overcirculation, requiring diuretics and high-flow nasal cannula. Morphometric evaluation in IVS/D-TGA revealed heart enlargement predominantly in right cavities and systemic arteries (Right-Left-mid ratio 1.2 vs 0.8,  $p=0.001$ ; Pulmonary-Aortic ratio 0.9 vs 1.4,  $p=0.002$ ). This enlargement wasn't seen in PHT compared with the non-PHT-group (RightVentricle end-diastolic mid-diameter 11.2 vs 15.2mm,  $p=0.04$ ; RVdiastolic area 1.8 vs 3.1cm<sup>2</sup>,  $p=0.04$ ; RVsystolic area 1.1 vs 1.8cm<sup>2</sup>,  $p=0.02$ ).

Biventricular functionality was increased in IVS/D-TGA [RVsystolic( $s'$ 7.8 vs 5.3cm/s,  $p=0.001$ ; ICT 36.9 vs 45.0ms,  $p=0.03$ ) and diastolic function (E 90.7 vs 50.8cm/s,  $p=0.001$ ;  $e'$ 13.1 vs 7.3cm/s,  $p=0.001$ ;  $a'$ 11.1 vs 8.2cm/s,  $p=0.002$ ; E/A 1.3 vs 0.9,  $p=0.002$ ), LeftVentricle systolic (Teichholz Ejection-Fraction 75.4 vs 69.9%,  $p=0.04$ ; MAPSE 6.5 vs 5.6mm,  $p=0.03$ ;  $s'$ 6.2 vs 4.4cm/s,  $p=0.001$ ; VFC 0.26 vs 0.24,  $p=0.02$ ) and diastolic function (E 96.5 vs 59.5cm/s,  $p=0.001$ ; A 71.4 vs 52.6cm/s,  $p=0.002$ ;  $e'$ 8.7 vs 6.4cm/s,  $p=0.002$ ;  $a'$ 8.4 vs 6.3cm/s,  $p=0.01$ ; E/A 1.5 vs 1.2,  $p=0.03$ ).

In PHT group, right systolic (TAPSE 8.7 vs 9.4mm,  $s'$ 5.6 vs 7.9cm/s), diastolic (E 43 vs 97cm/s, A 54.8 vs 71cm/s,  $e'$ 5.5 vs 13.3cm/s,  $a'$ 7.3 vs 11cm/s), and left systolic (MAPSE 5.1 vs 6.5mm, SAPSE 3.8 vs 6.7mm, mitral  $s'$ 5 vs 6.3cm/s, septal  $s'$ 4.8 vs 5.5cm/s) and diastolic function (E 86.3 vs 98.9cm/s, A 58 vs 71cm/s, mitral  $e'$ 5.9 vs 9.1cm/s, mitral  $a'$ 4.3 vs 8.8cm/s, septal  $e'$ 4.9 vs 7cm/s, septal  $a'$ 4.6 vs 7.8cm/s) are decreased.

Conclusions: Non-corrected IVS/D-TGA have an increase in global size and biventricular function. PHT produces the opposite effect, with a global morphological and functional decrease. Larger series should be needed to identify whereas PHT IVS/D-TGA patients have a different preoperative functional pattern compared with noPHT patients.