Malposition of the great arteries: A new 3D echocardiographic approach
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Purpose. — Geometric profile of the left and right outlets as well as position and size of the ventricular septal defects (VSD) determine the surgical approach of malposition of the great vessels.

Aim. — To determine the ability of the 3D echocardiography (3DE) to depict the outlet chambers in normal and pathologic situations.

Methods. — Twenty patients were prospectively enrolled [10 had normal heart, five tetralogy of Fallot (TOF), three double outlet right ventricle (DORV), two double discordance (DD) with VSD]. The median age was 3.6 years (range 2 months—13 years). All underwent transthoracic 3DE (Philips, ie 33, X5-1 and X7-2). Full volume and Live 3D acquisition were performed. Off-line analysis was performed using a dedicated system (Qlab version 9). An asymmetry index of the VSD was calculated by the maximal 3D diameter divided by the minimal 3D diameter. A cut-off of 1.25 was set to distinguish ovale and circular shape.

Results. — Mitro-aortic continuity was observed in all controls and patients with TOF. Mitro-aortic distance was measured in patients with DORV (36 mm/m²). Septo-aortic and septo-pulmonary continuity was observed respectively in control and DD with VSD. Distance between tricuspid and pulmonary valve was (25.7 mm/m²) in control, (54.4 mm/m²) in TOF, (58.9 mm/m²) in DORV, and (17.5 mm/m²) in DD. VSD was in sub-aortic position in TOF and in 3 DORV; in sub-pulmonary position in two DD. Mean size of the VSD was 13.8 mm (27.3 mm/m²). Shape of the VSD was circular in all but one DD with small oval VSD; subvalvar insertion on VSD crest was observed in the same patient responsible of sub-pulmonary stenosis.

Conclusions. — 3DE is able to describe the outlet chambers and VSD position and geometry. This tool could help to determine the best surgical strategy in patients with malposition of the great vessels.

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Isolated left ventricular non-compaction: Relationships between MRI criteria for non-compaction and clinical events
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Background. — Isolated ventricular non-compaction is a congenital cardiomyopathy, based on an arrest of normal embryonic myocardium development and characterized by the presence of a two-layered myocardial structure, with a compacted epicardial band and a non-compacted endocardial layer of prominent trabeculations. It is sometimes complicated by ventricular dysfunction and heart failure, arrhythmias or thrombo-embolic events.

The aim of our study was to look for a potential relationship between magnetic resonance imagery’s non-compaction extension criteria and these clinical events.

Methods. — Between 2004 and 2013, we conducted a retrospective study reviewing magnetic resonance imagery with diagnosis of non-compaction. One hundred and twenty-five patients presented magnetic resonance imagery’s non-compaction criteria but 26 of them had another associated cardiomyopathy. Finally, 99 patients fulfilled the diagnosis of isolated ventricular non-compaction and were included in the study. Left ventricular ejection fraction, left ventricular volumes, global left ventricular mass, compacted and non-compacted left ventricular mass, number of non-compacted segments and non-compaction score were measured. Non-compaction score was the sum of the ratios of the thickness of non-compacted to compacted myocardial layers superior to 2.3, measured in the diastolic phase.

Results. — There was no statistical relationship between left ventricular ejection fraction alteration and non-compaction score (P = 0.57) or number of non-compacted segments (P = 0.97) between stroke incidence and non-compaction score (P = 0.22) or number of non-compacted segments (P = 0.96) and between ventricular arrhythmias and non-compaction score (P = 0.59) and number of non-compacted segments (P = 0.59). Conversely, we found a significant inverse relationship between left ventricular ejection fraction and compacted mass (P = 0.0001) and between stroke and compacted mass (P = 0.007).

Conclusion. — Our study did not show any association between magnetic resonance imagery criteria of non-compaction extension and clinical events. Conversely, we found a relationship between compacted mass and left ventricular ejection fraction dysfunction and the incidence of strokes, but not of ventricular arrhythmias. These findings suggest that isolated left ventricular non-compaction does not involve only the non-compacted part of the myocardium, but also its compacted part.

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Percutaneous stent placement for aortic coarctation in adolescents and adults
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Aim. — The aim of this study was to assess the results of transcatheter stent treatment of native or recurrent coarctation of the aorta in adolescents and adults, as an alternative to surgery.

Material and methods. — Single-center study included patients aged > 10 years with significant recurrent or native coarctation of the aorta. Clinical data (blood pressure, antihypertensive medications), echocardiographic (maximal aortic gradient, LV shortening fraction), CTscan (isthmus diameter) measurements and hemodynamical isthmus gradient were assessed before and after the procedure. All procedures were performed under general anesthesia.

Results. — From 2009 to 2012, eighteen patients, aged 10.8 to 49 years (mean 26), with native (6) or recurrent (12) coarctation underwent transcather stent placement. All had high blood pressure and 80% were given antihypertensive medicaions. Doppler peak systolic gradient across the coarcted segment before procedure was 61 ± 16 mmHg. LV hypertrophy was present in 50% of the cases, mean LVFS was 27%. Stent was successfully implanted in all patients. The balloon to coarcted segment diameter ratio was 2.5 ± 0.5, stents diameters ranged 34 to 45 mm. Peak to peak hemodynamic gradient decreased from 25 ± 11 before to 3 ± 3 mmHg after stent placement. Doppler maximal gradient decreased to 20 ± 5 mmHg. Arterial hypertension regressed or improved in 77% of the cases. Echocardiographic LV hypertrophy persisted in only 30% of the cases. These results maintained at mean 19-months follow-up (1 month to 3 years). Adverse events included one early femoral artery thrombosis and one external iliac artery thrombosis, but no clinical limb ischemia occurred.