2 D strain in the right systemic ventricular evaluation: myth or reality?

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Introduction: Assessment of right systemic ventricle is a current issue. In fact, Right systemic ventricular dysfunction frequently occurs years after atrial switch (Mustard or Senning procedures) in patients with complete transposition of the great arteries (TGA).

2 D strain is an ultrasound technique that has proven itself on the systemic left ventricle and is being explored on the right systemic ventricle. But is it really valid?

Methods: We prospectively enrolled 46 clinically stable patients with TGA treated by atrial switch operation. Transthoracic echocardiography and MRI were realized the same day. Transthoracic echocardiography was performed using the Vivid 7 ultrasound system.

We measured 2 D RV strain, MRI was performed equally the same day. Right ventricular End Systolic Volume, End Diastolic Volume, and Ejection Fraction were measured.

Pearson rank test was used to evaluate correlations.

Results: The 2 D theoretic strain is –13.5% (±4)/30, the 2D max strain is –15%(3.5)/29, the strain delay index is 5.7%(±5)/27. Intra- and inter-observer variability of 2 D strain were 10% and 17%.

The 2D global strain is not correlated with the RV ejection fraction (p=0.20 r=0.25), equally for the strain delay index and the 2D max strain (p=0.68 r=0.09 and p=0.62 and r=0.10 respectively)

Conclusion: Strain requires excellent echogenicity. The longitudinal strain is more in the register of myth than reality. Only 2 D circumferential strain could be interesting in the right systemic ventricle’s assessing.

Is electrophysiological study required in children with spontaneous supraventricular tachycardia and normal ECG in sinus rhythm?


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The recording of a paroxysmal supraventricular tachycardia (SVT) in children or teenagers with a normal ECG in sinus rhythm (SR), leads to a symptoms-related management, because SVT is considered as benign. Electrophysiological study (EPS) is not recommended except before SVT ablation. This last indication remains rare in children. The purpose of the study was to evaluate the interests of EPS in children with SVT and a normal ECG in SR.

Methods: 102 children and teenagers aged from 5 to 19 years (mean 15±3) with a normal ECG in SR were studied for spontaneous SVT by transesophageal route. Programmed atrial stimulation was performed in control state with a normal ECG in SR.

Results: 3 verapamil-sensitive ventricular tachycardias have been missed. In 19 patients (19%) at atrial pacing. AP was left lateral (n=12) or septal (n=7). These children were missed preexcitation in SR, but with patent anterograde AP conduction, had inducible orthodromic atrioventricular re-entrant tachycardia (AVRT). Five of them had a high rate conducted through AP (>240 bpm in CS or >290 bpm after isoproterenol); 2, one girl 10 years old, one teenager 17 years old had the criteria for a potentially malignant form with the inducion of atrial fibrillation conducted with a 1/1 conduction over AP >290 bpm in CS. Among remaining population, 54 children (53 %) had a typical AV node reentrant tachycardia (AVNRT), 6 an atypical AVNRT (6 %) and 20 (20 %) had a reentry through a concealed AP. These last patients have no anterograde conduction through the AP.

Conclusions: Systematic EPS should be performed in children with SVT and apparently normal ECG in SR. The data were helpful to guide the medical treatment, the follow-up and the indications of ablation. VT could be misdiagnosed. Masked preexcitation syndrome with anterograde conduction through an AP was present in 19 % of our population.

Echocardiographic evaluation of the right heart in Eisenmenger patients: a comparison study with other causes of PAH

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Patients with Eisenmenger syndrome (ES) have a survival advantage over those with other causes of PAH. Improved survival may result possibly over preservation of RV function as the RV does not undergo remodelling at birth and remains hypertrophied.

In this study, we aimed to compare the right heart echocardiographic parameters in 2 different populations: adult patients with Eisenmenger syndrome and patients with idiopathic and other causes of PAH.

We studied 70 patients with Eisenmenger syndrome (ES) (10 ASD, 1 aortopulmonary window, 10 PDA, 29 VSD, 20 cAVSD) and 30 patients with non congenital PAH (12 iPAH, 5 patients with ILD and group 3 PAH, 8 CTPH, 1 portopulmonary hypertension, 3 PAH related to HIV and 1 Von-Recklinghausen syndrome).

Patients with ES are younger (39±15 vs 67±13, p<0.001) and less treated with advanced therapies (p=0.03). Peak systolic tricuspid pressure gradient is higher (+23 mmHg, p<0.001) in congenital PAH. The RA area and the end-diastolic RV area were higher than normal for both patients but significantly lower in the ES group (20 vs 26 cm2; p=0,01 and 26 vs 30 cm2; p=0.02 respectively). Concerning the RV systolic function, TAPSE is similar in both groups (19.1±5 vs 20.5±4.2 mm; p=0.1), as well as the tricuspid TDI S (p=0.08). However, we found increased pulmonary blood flow and higher RV fractional area change in Eisenmenger patients (38.8±10.9% vs 31±8.7%, p=0.04).

Due to improved survival in Eisenmenger patients, we expected better RV parameters. On the contrary, we found that “standard” longitudinal RV evaluation is not different in Eisenmenger, whereas the FAC is significantly higher. This might be explained by a different pattern of RV contraction in ES with a major role for radial contraction. The Eisenmenger RV would contract more like a LV, facing systemic pressures from birth.

Multicenter experience for transcatheter closure of muscular ventricular septal defect with the Amplatzer duct occluder II

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Introduction: Transcatheter muscular ventricular septal defect (mVSD) closure remains challenging, especially in small patients. Although the Amplatzer Duct Occluder (ADO) II device is specifically designed for patent ducus arteriosus closure, it seems of great interest for mVSD closure, espe-