vascular resistance. We assessed the morphology of VSD using 3D transthoracic echocardiography (3D-TTE) and the ability to estimate the pathophysiology.

**Methods** Forty-eight children with isolated unique muscular (77%) and membranous VSD (23%) were included. Severity of the VSD was rated according to their pathophysiology. (Type 1: minor left-to-right (L-R) shunt; 2a: significant L-R shunt (left ventricular end diastolic diameter (LVEDD) Z-score > 2); 2b: VSD associated with pulmonary hypertension). 3D VSD measurements were obtained after a multi-planar reconstruction of a TTE 3D full volume (X5-1 or X7-2 matrix probes, ie33, Philips). Diagnosis properties of the ratio of 3D VSD area to aortic annulus area (3DA/AAA), 3D VSD area to body surface area (3DA/BSA) and 2Dmax diameter to BSA (2DD/BSA) were compared.

**Results** Median age was 8.5 month-old (min 1 max 123). LVEDD Z-score was > 2 in 19 children (40%), (12 (25%) had pulmonary hypertension). 3D-VSD systolic area, 3D and 2D max. diameters were correlated with LVEDD. (r = 0.71, r = 0.52, r = 0.55, P < 0.05). Systolic-diastolic variation of 3D VSD area was higher in muscular than in membranous VSD (Median 54% vs 27%, P = 0.0001). VSD were asymmetric with a mean ratio of maximal to minimal 3D diameters of 2.1 ± 1.3 in membranous VSD and 3.2 ± 1.5 in muscular VSD (P = 0.01). VSD severity was correlated with LVEDD Z-score, 3DA/AAA and 3DA/BSA ratio (r = 0.52, r = 0.63, r = 0.60, P < 0.05), but not with the 2DD/BSA ratio. Ability to diagnose type 2b VSD was higher with the 3DA/AAA or 3DA/BSA ratio than the 2D/BSA ratio. Ability to diagnose type 2b VSD was higher with the 3DA/AAA or 3DA/BSA ratio (ROC area 0.97 ± 0.08) than the 2D/BSA ratio (r = 0.39 has a sensitivity of 92% and a specificity of 97% to diagnose a 2b-VSD).

**Conclusion** 3D-TTE allows a morphological and a quantitative assessment of muscular and membranous VSD. The 3DA/AAA ratio is an accurate diagnostic tool to assess the pathophysiology of the VSD.

**Disclosure of interest** The authors have not supplied their declaration of conflict of interest.

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**Background** RV systolic strain evolution during peri-operative management of congenital heart diseases (CHD) is unknown.

**Methods** In this prospective study, RV peak systolic strain (PSS) was measured using 2D speckle tracking echocardiography (Qlab10.0 software, Philips) in 39 children undergoing surgery of a CHD (Median age: 17 months, min. 6 days old, max. 14.3 years old). Three measures were performed the day before surgery, few hours after the surgery and before discharge and compared to conventional echocardiographic parameters of RV and left ventricular (LV) function. The relationships between the evolution of RV-PSS, peri-operative parameters and the type of CHD were assessed.

**Results** Mean RV-PSS at baseline was −19.5 ± 4.8. RV-PSS was moderately correlated with the heart rate (r = 0.49), the LV T mad (r = 0.48), the TAPSE (r = 0.54) and the tricuspid S’ wave (r = 0.44) (all P < 0.05). RV-PSS was decreased in cyanotic CHD (P < 0.05), in children with congestive symptoms (P = 0.01) and increased in ASD (P = 0.02). RV-PSS was higher in RV volume increased condition such as ASD than in RV pressure increased condition such as Fallot tetralogy (P = 0.006). RV-PSS decreased after surgery (P < 0.0001). Mean difference between pre- and post-operative RV-PSS was 7.5 ± 4.4. The difference was correlated with initial RV-PSS (r = 0.80), the weight (r = 0.54), the ultrafiltration rate (r = 0.43) (all P < 0.05) but not with the duration of aortic clamp, the duration of extracorporeal circulation, the troponin peak level nor the lactates peak level. A higher difference was associated with a shorter duration of mechanical ventilation (P = 0.04) and a shorter stay in intensive care unit (P = 0.03). RV-PSS was better at discharge (median 6 days, P = 0.0009) but remained lesser than at the initial exam (P < 0.0001).

**Conclusion** RV-PSS decrease after surgery of CHD. This decrease seems mainly related to loading condition rather than to RV contractility given its relationship with a faster post-operative evolution.

**Disclosure of Interest** The authors have not supplied their declaration of conflict of interest.

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**Right ventricular systolic strain evolution during peri-operative management of congenital heart diseases**

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