

Poster n°26

### Usefulness of 3D printed models of congenital heart diseases as educational tools for medical students



A. Guitarte Vidaurre\*, K. Hadeed, Y. Dulac, C. Karsenty, P. Acar  
 Mother & children Hospitals Viguier Site, Pediatric Cardiology,  
 Toulouse, France

\* Corresponding author.

E-mail address: [guitarte.a@chu-toulouse.fr](mailto:guitarte.a@chu-toulouse.fr) (A. Guitarte Vidaurre)

**Introduction** Multiple studies have demonstrated the feasibility and accuracy of 3D printed models in congenital heart diseases. These models seem enhance conceptual 3D understanding of complex anatomy. Our aim was to evaluate the usefulness of these models as a teaching tool for medical students to improve learning of congenital heart diseases.

**Method** During the education sessions of left ventricle outflow tract obstruction (LVOTO), students from 5th year of medicine were randomized in the two groups. Each group (n=118) attended a 60minutes lecture of LVOTO. All students answered objective questions for pre- and post-lecture knowledge score evaluation, in addition to a subjective post-lecture survey questions regarding students comfort level with the subject. During the lecture, 3D printed models of different types of LVOTO were presented and analyzed by the students in the test group. Knowledge acquisition was evaluated by comparing pre and post-lecture knowledge score. Student's satisfaction and self-efficacy ratings were evaluated by the subjective post-lecture survey. The datas were analyzed and compared between the two groups using paired *t*-test.

**Results** There was no difference in pre-lecture objective test score between the two groups (score 8.32/14 vs. 8.35/14). After the lecture both groups improved their knowledge objective score, but was significantly higher in the test group than that of the control group (score 12.60/14 vs. 11.20/14 respectively  $P=0.04$ ). Students in the test group were more satisfied with their understanding of the diagnosis ( $P=0.03$ ) and treatment ( $P<0.01$ ) of LVOTO pathologies.

**Conclusion** This preliminary study demonstrates the feasibility and the usefulness of 3D printed models as educational tools of congenital heart diseases for medical students.

**Disclosure of interest** The authors declare that they have no competing of interest

<https://doi.org/10.1016/j.acvdsp.2019.04.055>

Poster n°27

### Accuracy of imaging fusion between echocardiography and fluoroscopy in percutaneous atrial septal defect closure in children



S. Hascoet\*, K. Hadeed, C. Karseny, Y. Dulac, G. Chausseray,  
 X. Alacoque, P. Acar

Hôpital Marie-Lannelongue, Pediatric Cardiology, Toulouse,  
 France

\* Corresponding author.

E-mail address: [hascoet.s@chu-toulouse.fr](mailto:hascoet.s@chu-toulouse.fr) (S. Hascoet)

**Introduction** Imaging fusion between echocardiography and fluoroscopy is now available in the catheterization laboratory. We aim to test the feasibility and accuracy of imaging fusion in a pediatric population.

**Method** Thirty-one patients (26 kgs [21–37]) underwent percutaneous atrial septal defect (ASD) closure were prospectively included. Occluder device's screw, visualized on both echocardiography and fluoroscopy images was used as a reference tool. Bias was measured between a marker positioned on the device screw visualized on echocardiography and the fluoroscopic screw image on the fusion screen (distance 1). Another bias was measured between the

screw on 3D echocardiographic image and the screw on fluoroscopic image (distance 2). The 2 distances were measured on 4 orthogonal views in end-systolic and end-diastolic frames.

**Results** Fusion and marker positioning were feasible in real-time in all cases. In 5 cases (16.1%), there was a transient loss of the automatic tracking of the probe during the procedure. Quality of imaging fusion was rated good in all cases. On the fusion screen, systolic and diastolic first distances were 0.5 [0.3–1] and 2 mm [1.5–2.5] ( $P<0.0001$ ). The marker positioned from echocardiography screen was fixed on fusion screen and did not follow the systole-diastolic translation of the screw. Systolic and diastolic second distances were 0.5 [0–0.5] and 2 mm [1.5–2.5] ( $P<0.0001$ ).

**Conclusion** Echocardiographic-fluoroscopic imaging fusion is feasible, safe and accurate in children above 20 kgs. This innovate technic offers a new real-time imaging guiding modality in the catheterization laboratory with potential interest in complex procedures as well as for fellow training.

**Disclosure of interest** The authors declare that they have no competing interest.

<https://doi.org/10.1016/j.acvdsp.2019.04.056>

Poster n°28

### Place in Ulyanovsk region of congenital malformations of the cardiovascular system in the structure of congenital malformations of the fetus



R. Sharafutdinova\*, I. Bakhtogarimov

Ulyanovsk State University, Ulyanovsk, Russia

\* Corresponding author.

E-mail address: [riza.otaku@mail.ru](mailto:riza.otaku@mail.ru) (R. Sharafutdinova)

**Introduction** Congenital malformations (CM) among children are the leading causes of childhood disability and the second largest contributor to child mortality. The first place in the structure of the CM of the fetus is held by the pathology of the cardiovascular system (CVS) (22.1%).

**Method** In the consultative and diagnostic department of the Ulyanovsk Regional Clinical Hospital 29563 pregnant women were examined from 2013 to 2017. The studies were conducted by trans-abdominal scanning on Voluson E6 and Voluson E8 devices.

**Results** An analysis of the ultrasound diagnostic data of all the women examined revealed 966 cases (3.3%) of CM. The frequency of CVS was 211, representing 0.7% of the total number of cases examined, and 21.8% of all congenital disorder. Studies have shown that from 2013 to 2017, the congenital disorder of CVS frequency increased from 12.4% in 2013, 19.2% in 2014, and 22% in 2015, in 2016.—31.3% of all birth defect. The most frequent diagnoses were a ventricular septal defect, from 20% in 2014 to 32% in 2016, and aortic and pulmonary anomalies, from 13.2% in 2014 to 24.9% in 2016. The frequency of complex CM fluctuated from 8.8% in 2014 to 16.0% in 2015 and 7.6% in 2016. The frequency of hypoplastic syndrome decreased by year from 8.8% to 3.8%. The frequency of other detected defects (aortic coarctation, endocardial fibroelastosis, persevering left upper hollow vein, full AV-channel, Fallo tetrad, main vessels transposition) ranged from 1.6% to 8.8%.

**Conclusion** Among the main causes of reproductive losses in the perinatal period CM of the fetus occupy a leading place. A special role in the complex of measures for the prevention and prevention of hereditary and congenital diseases belongs to prenatal diagnosis, which helps prevent the birth of children with severe malformations, and thus reduce the genetic burden of the population.

**Disclosure of interest** The authors have not supplied their declaration of competing interest

<https://doi.org/10.1016/j.acvdsp.2019.04.057>