

## GW25-e1160

**Detection of right-to-left shunt in secundum atrial septal defect without severe pulmonary hypertension by saline contrast**

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**Objectives:** During the last decades, the right-to-left atrial communication was considered as one of the main cardioembolic sources for cerebral infarction. Patent foramen ovale (PFO) was commonly mentioned, although data were controversial. What confused us most was that the passages of atrial communication in ASD were much wider than PFO, but ASD without severe pulmonary hypertension or atrial fibrillation wasn't closely related to cerebral infarction. Was it because RLS seldom existed or RLS was not the main explanation of cerebral infarction? With this question, we carried out the study aiming to detect the characteristics and correlating factors of right-to-left shunt (RLS) in uncomplicated ASD.

**Methods:** 78 secundum ASD patients without severe pulmonary artery hypertension (systolic peak pulmonary artery pressure >80mmHg assessed by echocardiography by tricuspid regurgitation) or other known congenital or acquired heart diseases were consecutively recruited between June 2012 and February 2014 at the first affiliated hospital of Dalian Medical University. Informed consent forms were signed by all patients. Routine views of transthoracic study were performed. Standard 2-dimensional and Doppler echocardiography was performed with optimized and second harmonic imaging (GE, USA, Vivid 7, 3.5-MHz probe). Three continuous cardiac circles were recorded and copied in CDs for offline analysis. All of them received intravenous agitated-saline contrast with Valsalva maneuver. Interatrial RLS was retraced and graded. Statistical analysis was performed by SPSS17.0 software.

**Results:** (1) The ratio of women/men was 1.9:1. A small portion of patients had comorbidities of essential hypertension and diabetes. No cerebral infarction history was found. (In) complete right bundle branch block was the main abnormality in ECG. (2) RLSs were found in 60 out of 78 (77%) patients by TTE and provocative maneuvers, among which three patients with RLS occurred only in post-maneuver coughing. The positive rate of RLS at rest, inhalation, expiration and coughing phases were 95%, 23%, 90% and 93%. The rest phase was most sensitive, although no significant difference was seen as compared with the expiration and coughing phases. The Valsalva maneuver gave no additive benefits. (3) The peak of RLS occurred at either early diastole (41 out of 60, 68%) or early systole (17 out of 60, 28%). Intervals from the onset of QRS in ECG to the beginning of Systolic motion or early diastolic motion in tissue Doppler at annulus levels of left and right free walls were measured. Their differences representing the dyssynchrony of ventricular motions were measured and demonstrated to be the only determinant of RLS.

**Conclusions:** A large portion of RLS existed in ASD patients without severe pulmonary artery hypertension, most of which occurred in early diastole. Valsalva maneuver was not necessary. The dyssynchrony of ventricular motions might be its main explanation.

## GW25-e1598

**Transcatheter occlusion of ventricular septal defect after Fallot's tetralogy repair**

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**Objectives:** To report experiences of transcatheter occlusion of ventricular septum residual leakage after Fallot's tetralogy repair.

**Methods:** Chose 9 inpatients (average age was 15.68±5.20 year old) who were diagnosed with ventricular septum residual leakage after Fallot's tetralogy repair according to history and echocardiography in department of cardiology from January 2010 to November 2012. Make a transcatheter occlusion according to the common congenital heart disease interventional therapy expert consensus.

**Results:** The 9 inpatients were diagnosed with Fallot's tetralogy and accepted surgical repair treatment. 2 patients appeared left sternal appear grade 3/6 systolic murmur two months later after the repair surgery. They were diagnosed with ventricular septum residual leakage according to echocardiography and the leakage size were 6 mm and 5 mm. 3 patients appeared systolic murmur one years later after the repair surgery and were diagnosed with ventricular septum residual leakage and the leakage size were 7 mm, 6 mm and 9 mm. 3 patients appeared systolic murmur two years later after the repair surgery and were diagnosed with ventricular septum residual leakage and the leakage size were 8 mm, 7 mm and 8 mm. Because of difficulty breathing, 1 patients was found systolic murmur after the examination ten years later after the repair surgery and was diagnosed with ventricular septum residual leakage according to echocardiography and the leakage size were 10 mm. 7 of them received successful transcatheter occlusion and the success rate was 77.78%. 5 patients received domestic symmetric septal occluder. One of them received two occluders. 1 patients received A4B2 occluder and received domestic ductus arteriosus mushroom occluder. The 7 patients had no intervention -treatment-related complications. The other two patients were diagnosed with porous residual leakage according to left ventricular angiography and they received surgical repair treatment again.

**Conclusions:** Ventricular septum residual leakage after Fallot's tetralogy repair can be cured by interventional occlusion treatment and there was few complications and its success rate was higher using domestic symmetric septal occluder or domestic ductus arteriosus mushroom occluder. Doctors should avoid track guide wire and sheath injure muscle trabecular and tendon.

## GW25-e1601

**Transcatheter occlusion of ventricular septal defect in patient with Mirror dextrocardia**

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**Objectives:** Reported experience of transcatheter occlusion for ventricular septal defect in two patient with mirror Image Dextrocardia.

**Methods:** Case one, 3-year-old girl (15 kg); hospital number is 0538696; come in our hospital due to the discovery of a heart murmur since 3 years ago on July 27th, 2012. Physical examination: HR 90 bpm R 18 bpm P 90 bpm BP110/76mmHg; BP110/76mmHg; In the 3-4 intercostal of right edge of the sternum could found III/6 Systolic murmur. Echocardiography showed mirror right ventricular, left ventricular dilatation and a 5mm Septal discontinuity in aortic short axis view. The ultrasound also showed reversed abdominal organs. She was diagnosed with Ventricular septal defect (Mirror dextrocardia), Cardiac function class I. Case two, a 27-year-old male (55 kg); Hospital number is 0625496; come in our hospital due to the discovery of a heart murmur since 20 years ago on December 23th, 2013. Physical examination: HR 88 bpm R 20 bpm P 88 bpm BP120/70mmHg; In the 3-4 intercostal of right edge of the sternum could found III/6 systolic murmur. Echocardiography showed mirror dextrocardia, dilated left ventricular, and a 7mm Septal discontinuity in aortic short axis view. ultrasound also showed the reversed abdominal organs. He was diagnosed with ventricular septal defect (Mirror dextrocardia), Cardiac function class I.

**Results:** the first patient undergoing transcatheter interventional occlusion in Interventional cardiology room on July 30th, 2012. The operation under general anesthesia. The second patient undergoing transcatheter interventional occlusion in Interventional cardiology room on December 26th, 2013. The operation under local anaesthesia. choose 6F, 7F expansion tube sheath, left ventricular angiography performed with a pigtail catheter. Showed ventricular septal defect; The defect of case one is 6.93-8.97mm, the defect of case two is 7.48mm. A loach guidewire was sent via the right femoral artery to build the whole rail track: Right femoral artery- Left ventricular- Ventricular septal defect - Right femoral vein. And sent a 9F sheath rupture via the right femoral vein into Left ventricle, across the right ventricle and ventricular septal defect. Finally, we successfully closed these defect use a 10mm and 12mm symmetrical device respectively.

**Conclusions:** Reverse Operation is useful for closure a Ventricular septal defect in patient with mirror dextrocardia, built a whole rail track is difficultly. Skillful operation is necessary.

## GW25-e3362

**Evaluation of right ventricular global and regional volume and systolic function in TOF children by RT-3DE**

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**Objectives:** The aim of this study was to investigate right ventricular global and regional volume and systolic function by real-time three-dimensional echocardiography (RT-3DE) in pre-operation TOF children.

**Methods:** 45 TOF children (median age 1.37±2.91ys) and 46 normal age-matched children (median age 1.37±2.85ys) were recruited in this study. Full volume imaging of right ventricle were obtained at the parasternal four-chamber view near the apex by RT-3DE. RT-3DE data set were analyzed off-line by TomTec RV-Function, which could provide information for RV global and regional volume and systolic function (regional parts including: inflow tract, body part and outflow tract). The measurements as following: enddiastolic volume (EDV), endsystolic volume (ESV), ejection fraction (EF), Peak systolic volume rate (PSVR). 12 randomly selected subjects were chosen for the analysis of the RV-Function reproducibility. The volumetric measurement were indexed to BSA.

**Results:** The reproducibility analysis showed there were good correlation and accordance between intra- and inter-observers measurements (intra- variability ranged: 6-10%, inter- variability ranged: 8-12%). For the global right ventricle, there was no difference in RVEDV between TOF and normal children (16.15±10.74ml vs 15.68±10.90ml, P=0.837), while indexed RVEDV in TOF group were significant higher than normal group (40.32±16.04ml/m<sup>2</sup> vs 31.21±6.44ml/m<sup>2</sup>, P=0.002). RV global systolic function were also significant lower in TOF group compared with normal (RVEF: 39.21±8.43% vs 51.62±6.32%, P=0.000; PSVR: 29.41±19.57ml/s vs 41.58±21.83ml/s, P=0.007) Among three regional parts: the inflow tract EDV and body part EDV in TOF had no difference with normal (inflow EDV: 8.17±4.95ml vs 7.55±5.39ml, P=0.564; body EDV: 5.12±3.69ml vs 4.11±3.29ml, P=0.172), indexed EDV of inflow tract and body part in TOF were significant higher than that in normal (indexed inflow EDV: 20.95±8.72ml/m<sup>2</sup> vs 14.89±3.48ml/m<sup>2</sup>, P=0.000; indexed body EDV: 12.47±5.22ml/m<sup>2</sup> vs 8.23±2.40ml/m<sup>2</sup>, P=0.000). The outflow tract EDV and indexed EDV in TOF were both lower than that in normal (outflow EDV: 2.92±2.57ml vs 4.02±2.77ml, P=0.042; indexed outflow EDV: 7.07±3.27ml/m<sup>2</sup> vs 8.09±2.16 ml/m<sup>2</sup>, P=0.048). All of the three parts volume contraction in TOF were reduced compared with normal (inflow EF: 51.08±13.67% vs 64.83±6.30%, P=0.000; body EF: 20.83±12.02% vs 27.12±11.38%, P=0.012; outflow EF: 36.71±14.68% vs 52.32±11.18%, P=0.000).

**Conclusions:** Significant pressure and volume overload existing in TOF lead to dilation and systolic function impairment of right ventricle.