0355

Complications after transcatheter ASD closure with the amplatzer septal occluder

François Godart (1), Ali Houeijeh (1), Morgan Recher (1), Marie Paule Guillaume (1), Olivia Domanski (1), Anne Sophie Polge (2), Marjorie Richardson (2)
(1) CHRU Lille, Hôpital Cardiologique, Cardiologie infantile et congénitale, Lille, France – (2) CHRU Lille, Hôpital Cardiologique, Echocardiographie, Lille, France

The aim of this study is to report complications of transcatheter ASD closure using the Amplatzer Septal Occluder (ASO) (St Jude Medical).

From December 1999 to October 2013 (April 2014), 760 patients underwent ASD closure with the ASO. Closure was mostly performed under general anaesthesia and transoesophageal echocardiography control. Choice of the device diameter was established after balloon sizing and measurement of the stretched diameter.

Mean age of the patients was 31.9±22 years (0.5 month – 84 years). The stretched diameter was 22.5±6.6 mm (5-40mm) and device dimension 22±6.7mm (4-40mm). Duration of the procedure was 41±15 minutes (10-120 minutes) and fluoroscopic time 7.63±6.65 minutes (1-92 minutes). Dose of radiation was 18.7±22 Gy.cm^2 (median 12 Gy.cm^2).

Implantation succeeded in 96.3% of pts and failure was mainly related to deficient rim. No device related death was noticed. Embolization occurred in 4 pts (0.5%): 1 in the aorta, 1 in the left ventricle, and 2 in the pulmonary artery. All but one underwent surgical extraction and ASD closure. The patient with aortic embolization had percutaneous device extraction and underwent subsequently successful implantation with a larger device. No patient required blood transfusion for any groin hematoma. One patient without aortic rim had hemopericardium one month after implantation; this was corrected by drainage with no recurrence and ASD full occlusion was noticed on colour Doppler control. No late complication was observed. The rate of full occlusion on Doppler control is more than 90%, and the remainings have trivial shunt.

Transcatheter ASD occlusion with the Amplatzer Septal Occluder is a safe and effective procedure. The rate of immediate complication is very low and need for immediate surgery following the implantation is rare (<1%). No device related late complications were reported up to 15 years after implantation. The risk of aortic perforation in absence of anterior rim (observed in about 20% of pts) is trivial and not a real limitation in clinical practice.

0391

Atrio-ventricular valve regurgitation in univentricular hearts: outcomes after repair

Daniela Laux (1), Mathieu Vergnat (2), Virginie Lambert (2), Bertrand Stos (2), Mohamed Ly (2), Regine Roussin (2), Emre Belli (2)
(1) CHU Hôpital Necker Enfants Malades-APHP, Cardiologie pédiatrique, Paris, France – (2) Centre Chirurgical Marie Lannelongue, Congenital Heart Disease, Le Plessis Robinson, France

Objective: To describe the early and midterm outcome after atrio-ventricular valve (AVV) procedure in patients with univentricular hearts (UVH) and to identify risk factors for AVV reoperation and death.

Methods: Retrospective review of patients undergoing procedure for AVV regurgitation at any phase of univentricular palliation from 1998-2013. Patient and procedure related variables were analyzed.

Results: 28 consecutive patients underwent 34 procedures for moderate+ AVV regurgitation at a median age of 3.7 years. 29% of patients had a common, 25% had dominant left, 14% had dominant right AVV and 32% two AVV. All patients benefited from valve repair at first procedure without early mortality. At hospital discharge patients preserved their ventricular function (FS <30%: preop 17% vs. postop 21%, NS) and only 14% had moderate+ residual regurgitation. Dominant left AVV and postoperative moderate+ regurgitation were univariate risk factors for death and transplantation. Younger age, need for repair before superior cavo-pulmonary shunt and significant residual regurgitation were univariate risk factors for AVV reoperation. Freedom from death and transplantation was 84% (CI 95%±0.14) at 5 and 10 years. Survival free from AVV reoperation was 77% (CI 95%±0.18) at 5 years and 66% at 10 years (CI 95±0.25). At last visit, 91% of survivors were in class NYHA 1-2 without ventricular dysfunction and with mild or less AVV regurgitation.

Conclusion: Patients with UVH and moderate+ atrio-ventricular valve regurgitation can profit from AVV repair without deterioration of their ventricular function but remain at increased risk for death and AVV reoperation.

0460

Radiation dose reduction in pediatric coronary CT: assessment of effective dose and image quality

Francesca Raimondi (1), Bouchra Habib Geryes (1), Diala Khraiche (1), Myriam Bensemlali (1), Philippe Richard (1), Nathalie Boddaert (2), Damien Bonnet (1)
(1) CHU Hôpital Necker Enfants Malades-APHP, M3C, Cardiologie congénitale et pédiatrique, Paris, France – (2)CHU Hôpital Necker Enfants Malades-APHP, Radiologie, Paris, France

Aim: to assess the impact of different scanning protocols on radiation dose and image quality for pediatric coronary computed tomography.

Materials and Methods: 100 children underwent coronary computed tomography after arterial switch operation from November 2012 to March 2014. Scans were done using two different scanner models without difference in scanning and image reconstruction parameters: Lightspeed VCT and Discovery HD750, 64-slice from GE Healthcare. Two consecutive changes in scanning protocols were performed: 1) the use of adaptive statistical iterative reconstruction (ASIR) instead of filtered back projection (FBP) for image reconstruction; 2) the optimization of scan acquisition parameters (current and tube voltage reduction). Premedication (beta-blocker) was used for all children to obtain heart rate < 80 BPM. Effective dose (ED) was calculated with the dose-length product method with a conversion factor adjusted for patient age. Image quality was evaluated by the referent physician. Scans were classified as « excellent », « good » or « with significant artifacts ».

Results: Patients were divided in three age groups: 0-4, 5-7 and 8-18 years. After adjustment for scan settings, median ED decreased by 28% (3.9 mSv, IQR 2.8-4.2), 40% (0.9 mSv, IQR 0.6-2.6) and 65% (0.7 mSv, IQR 0.5-0.9) for 0-4, 5-7 and 8-18 years age groups ($p< 0.05$), respectively. The prospective protocol (PULSE) was used in 40% of children. The reduction in radiation dose was not associated with reduction in diagnostic image quality.

Conclusions: Coronary CT can be obtained at very low radiation doses in pediatric patients using ASIR and prospective ECG-triggered acquisition with optimized scan parameters.

0491

Extracardiac or chromosomal anomalies strongly influence parental treatment decision and postnatal survival of neonates with prenatally diagnosed congenital heart diseases

Myriam Bensemlali (1), Fanny Bajolle (1), Jerôme Le Bidois (1), Laurent Salomon (2), Damien Bonnet (1)
(1) CHU Hôpital Necker Enfants Malades-APHP, M3C, Cardiologie pédiatrique, Paris, France – (2) CHU Hôpital Necker Enfants Malades-APHP, Gynécologie obstétrique, Paris, France

Objectives: This study was design to assess the influence of extracardiac or chromosomal anomalies on parental decision of termination of pregnancy and on survival rates in newborns with prenatally diagnosed congenital heart diseases.

Methods and results: 2057 consecutive foetuses with congenital heart disease diagnosed from January 2002 to December 2011 were included: 1258 (61%) in-born neonates and 799 (39%) terminations of pregnancy (TOP). The overall prevalence of major extracardiac or chromosomal anomalies was 18,6%. Of the 1258 newborns, 121 had a major associated anomaly but only 55 were identified before birth. Prenatally identified associated anomalies were significantly lower in the newborn group in comparison with the TOP group (4% vs 31%, p<0,0001). They were also lower in the surviving group at one year of follow up (7,5% vs 20,7%, p<0,0001). A 4-fold increase of death rate was observed if an associated anomaly was identified (IC95%[2,5-

6,7], p<0,0001). These associations remained significant after multiple logistic regression analysis including the severity of the heart defect (univentricular or biventricular physiology).

Conclusion: Women are more likely to terminate pregnancy if extracardiac or chromosomal anomalies are associated. Post natal survival is strongly influenced by these associated anomalies.

0524

Experience with foetal supraventricular arrhythmias

Francis Bessiere (1), Hervé Joly (1), Jérôme Massardier (2), Magali Veyrier (1), Nicolas Pangaud (1), André Bozio (1), Sylvie Di Filippo (1)
(1) Hôpital Cardiovasculaire, Cardiologie pédiatrique et congénitale, Lyon, France – (2) Hôpital Femme Mère Enfants, Obstétrique, Lyon, France

This study was to review experience and outcomes of supraventricular (SV) arrhythmias in fetus Methods: Cases were divided in groups: SVPB= premature SV beats, NSSVT= non-sustained SV tachycardia, SSVT= sustained SV tachycardia, and AF= atrial flutter. Heart failure (HF) was defined as foetal hydrops or isolated effusion (pericardial or pleural or ascitis). Outcome was favourable if arrhythmia resolved or stabilized until full-term birth, not-favourable if premature birth or foetal death occurred.

Results: 188 fetuses were included:89 in SVPB(47.3%), 31 in NSSVT(16.5%), 60 in SSVT(31.9%), 8 in AF(4.3%), aged at diagnosis 30.8±4.5weeks (no difference between groups). Foetus HR at diagnosis was 241±30bpm in SSVT vs 226±26 in AF. Antiarrhytmic therapy was administered in sustained tachycardia (83% of SSVT and 71% AF): 28 had 1 medication, 25: 2 medications, 2: 3 medications. Complication occurred in 29 cases, all in SSVT and AF (29 of 68= 43%): 18 hydrops, 5 ascitis, 4 pericarditis, 1 pleural effusion and 1 LVdysfunction+MR, was more frequent in SSVT (86%: hydrops in 30%) than AF (51%: no hydrops), p= 0.08. Fetal HF was associated with HR at diagnosis: 251±25bpm in hydrops vs 228±31bpm in no-hydrops (p=0.025). Outcome was favourable in SVPB and NSSVT, in 45 of SSVT+AF (79%). Tachycardia resolved in 36, more frequently in SSVT (57%) than AF (25%). HR only decreased in 9cases. Premature birth occurred in 10, foetal death in 2. Outcome was not associated with HR or weeks of gestation at diagnosis. Defavourable outcome was more frequent in hydrops or isolated effusion (57%) than in uncomplicated cases (10%, p= 0.0002). Resolution occurred in 45% hydrops vs 66% of non-hydrops cases. Digoxine decreased from 79% of cases before 2000 to 33% after 2000, while flecaine increased from 14% to 48.5%. There was no relationship between therapy or number of medications and outcomes.

Conclusion: Fetal SSVT more frequently resolves but has worse outcome than AF, especially if HR at diagnosis is high and hydrops occurs. Larger scale prospective studies are needed to evaluate the efficacy of flecaine compared to digoxine therapy.

0537

Risk markers of cardiac events in patients with Marfan syndrome diagnosed during childhood

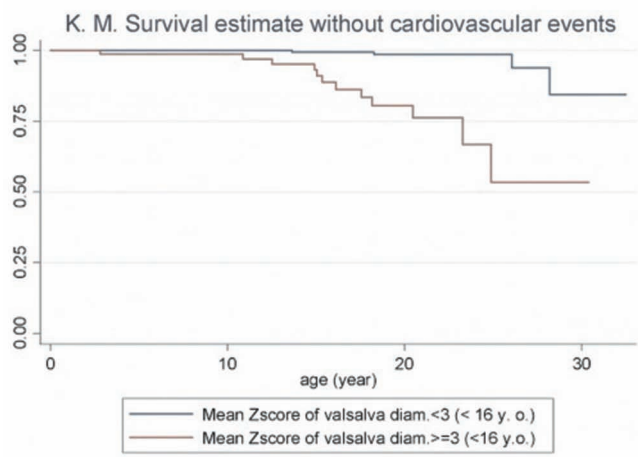
Sébastien Hascoët (1), Yves Dulac (2), Jean-Bernard Ruidavets (3), Thomas Edouard (4), Florence Arnoult (5), Olivier Milleron (5), Chantal Stheneur (6), Bertrand Chevallier (6), Cécile Zordan (7), Sylvie Odent (8), Nicole Philip (9), Laurence Olivier-Faivre (10), Bruno Leheup (11), Sophie Dupuis-Girod (12), Philippe Acar (2), Jean Ferrière (3), Guillaume Jondeau (5)
(1) CHU Toulouse, Hôpital des enfants, Pediatric cardiac surgery, Toulouse, France – (2) CHU Toulouse, Hôpital des enfants, Pediatric cardiology, Toulouse, France – (3) CHU Toulouse, Epidémiology, U 10 27, INSERM, Toulouse, France – (4) CHU Toulouse, Hôpital des enfants, Endocrinologie pédiatrique, Toulouse, France – (5) CHU Bichat-Claude Bernard-APHP, Cardiologie, Centre de référence pour le syndrome de Marfan et apparentés, Paris, France – (6) Hôpital Ambroise Paré-APHP, Pédiatrie, Boulogne, France – (7) CHU Bordeaux M3C, Pediatric and congenital cardiology, Bordeaux, France – (8) CHU Rennes, Hôpital Sud, Génétique, Rennes, France – (9) CHU la Timone enfant-APHM, Génétique clinique, Marseille, France – (10) CHU Dijon, Hôpital des enfants, Pédiatrie – Génétique clinique, Dijon, France – (11) CHU Nancy Brabois, Hôpital des enfants, Cardiologie pédiatrie, Vandoeuvre Les Nancy, France – (12) CHU Lyon, Hôpital Louis Pradel, Génétique clinique, Bron, France

Risk markers of cardio-vascular events in children with Marfan syndrome remain little known. Aortic root z-score measurements have been recently updated. We assessed the prognostic value of aortic root z-score in patients with Marfan syndrome diagnosed during childhood.

Methods: From the French multicenter database, 457 patients with Marfan syndrome, diagnosed before 18 y.o., without a history of cardiac event were prospectively included in this cohort study. Echocardiographic measurements of aortic root diameters were performed at each visit. We calculated the Z-score of aortic root measurements using the Bichat formula for each visit. Mean z-score was defined as the mean of the z-score (MeanZS15) calculated for each measurement before the age of 16.

Results: Median age at end of FU was 15.9 years (interquartile 10.9-20.3). FU was complete for 69.5% of patients. Median FU was 4.6 years. A cardiovascular event occurred in 17 patients (3.7%, prophylactic aortic surgery n=14, aortic dissection n=1 and deaths n=2). Survival free of cardiac events was 85.1% in patients with a meanZS15 of the Valsalva diameter <3 and 56.4% in patients with a meanZS15 of the Valsalva diameter ≥3 (p<0.0001 by log-rank test).In univariate analysis, Valsalva meanZS15 ≥3, age at inclusion in the database, a lower heart rate and an increased arm/height ratio were associated with an increasing risk of cardiac events (p<0.0001, p=0.04, p=0.01 and p=0.04 respectively). After multivariate adjustment using a cox proportional hazards model, only Valsalva meanZS15 ≥3 and lack of FBN1 or TGBB mutation identified were associated with an increasing risk of cardiac events (p<0.0001 and p=0.04 respectively).

Conclusion: Valsalva meanZS15 may help to predict whose children with a Marfan syndrome will have a cardio-vascular event. Therefore a particular attention to beta-blockade treatment observance and a regular follow-up may be suggested in high-risk children.



Abstract 0537 – Figure: k.m. survival estimate free from cardiac events

0564

Can systolic Doppler velocimetry of fetal aortic isthmus help predicting post-natal clinical impact of ventricular septal defects?

Julie Thomas-Chabaneix (1), Jean-Claude Fouron (2), Nagib Dahdah (2)
(1) CHU Bordeaux, Maladies cardiaques congénitales, Pessac, France – (2) CHU Ste Justine, Montréal, Canada

Objectives: Left ventricular ejection causes a forward flow in the fetal aortic isthmus while right ventricle (RV) has a retrograde influence. The objective of this study was to test the hypothesis that non restrictive ventricular septal defects (VSD) could cancel out the normal fetal RV preponderance and its retrograde systolic effect on the isthmic flow pattern.