Methods and Results: We included prospectively the 42 consecutive patients (younger than 75 yo) implanted in the University Hospital of Toulouse with ACC/AHA/ESC indications for CRT. Characteristics of the population were: male sex 88%, ischemic cardiomyopathy 45%, mean LVEF 22%, mean QRS duration 160ms, CRT-D 98%. The echocardiographic (Pulsed Doppler and Tissue Doppler Imaging) parameters of cardiac dysynchrony were obtained at baseline and six month (or more) after CRT implant. We defined the responder group as an improvement in 1 NYHA class and no hospitalisation for heart failure (HF) during the follow up (mean duration 15 month). 62% (n=26) were clinical responders. The echocardiographic assessment was done at 11 (6 to 20) month. There was no statistically significant difference between the "residual" mechanical dysynchrony of the responders versus the non-responders. Considering only the responders, there is no reduction of LIVD at six month after CRT. A baseline aortic pre-ejection delay > 140 ms, a non ischemic cardiomyopathy and the left ventricular activation time measured before implantation with a method described recently by Sweeney et al are the only factors of response to CRT.

Conclusions: The clinical response to CRT is not well correlate with the "residual" mechanical LIVD such as we measured by echocardiography (DTI and PD).

194

Cardiac resynchronization therapy in elderly patients

A Rollin-Garderes (1), A Duparc (1), P Mondoly (1), N Combes (2), A Hebrard (1), M Delay (1), Ph Maury (1), Jp Albenque (1), Didier Carrié (1), S Boveda (2)
(1) CHU Rangueil, Cardiovascular and Metabolic Pole, Toulouse, France - (2) Clinique Pasteur, Toulouse, France

Background: Cardiac Resynchronization Therapy (CRT) improves morbidity and mortality in systolic heart failure. Elderly patients are under represented in large clinical trials although incidence of heart failure is high in this population.

Method: we considered 146 consecutive patients 75 years old with standard indication for CRT implanted between 2005 and 2007. Mean age was 79 yo, 72 % males, EF= 27%, ischemic heart disease (IHD) 46%, Atrial Fibrillation 54%, CRT-D: 16%. Minimal follow-up was 12 months. Total mortality, clinical improvement (gain > 1 NYHA class without hospitalization for congestive heart failure) and combined criteria (mortality and clinical improvement) were retrospectively assessed.

Results: Mean follow-up is 25 +/-12 months. Data are complete for 137 patients (94.2%).
Survival rate is 65%, clinical improvement is achieved in 51% and combined criteria in 45%.
Independent factors of non response ($p<0.10$) are summarized in the table.
Causes of deaths are: terminal heart failure: 35 pts, sudden cardiac death: 1 pt, non cardiac death: 13 pts and unknown: 2 pts.

Conclusion: CRT is effective in elderly patients. Factors of non response are similar to those observed in younger population. CRT-P appears to be the most suitable device for this population.

(Voir tableau ci-dessous)

195

Mechanical dyssyncrony and response to cardiac resynchronization therapy in patients with narrow QRS complex.

Caroline Dussault (1), Erwan Donal (2), Patricia Réant (3), Stéphane Lafitte (3), Raymond Roudaut (3), Gilbert Habib (3), Pascal Gueret (1), Pascal Lim (1)
(1) CHU Henri Mondor, Fédération de cardiologie, Créteil, France - (2) CHU Rennes, Rennes, France - (3) CHU Bordeaux, Bordeaux, France

Objective: To assess whether LV mechanical dyssynchrony may be used to predict response to CRT in patients with narrow QRS complex (<120ms). Methods: CRT was performed in 183 symptomatic heart failure patients (64±12 years, EF=25±8%) with narrow (n=41) and wide QRS complex (n=142). Mechanical dyssynchrony before CRT implantation was quantified by the 12 segment standard deviation of peak longitudinal strain by speckle tracking (12SD) and the strain delay index (SDI) defined as the sum of difference between end systolic and peak strain across the 16 segments.

Results: Before CRT, wide and narrow QRS patients had similar 12SD (100±32ms vs. 105±35ms) and SDI (36±14% vs. 38±15%). However, in wide QRS patients, QRS duration decreased after CRT (143±35ms vs. 120±34ms, $p<0.0001$) and ESV reduction (mean= -21%, ESVR>15% in 66%, 92/139) correlated with SDI ($r=0.41$, $p<0.0001$) and 12SD ($r=0.21$, $p=0.01$) before CRT. In contrast, in narrow QRS population, QRS duration increased after CRT (96±16ms vs. 108±28ms, $p=0.006$) and ESV reduction (Mean=-11%, ESVR>15% in 39% (25/41) failed to correlate with mechanical dyssynchrony before CRT. Importantly, increase in QRS duration after CRT in narrow QRS population was associated with adverse remodeling ($r=0.43$, $p=0.01$) and tended to correlate with an increase in SDI after CRT ($r=0.32$, $p=0.08$).

Conclusion: Response to CRT does not correlate to the importance of mechanical dyssynchrony in narrow QRS population. The benefice of CRT despite a significant LV dyssynchrony appears counterbalanced by a significant QRS enlargement after CRT implantation in narrow QRS population.

196

Non response after cardiac resynchronisation therapy is associated with a more severe cardiomyopathy

Laurence Jesel (1), Annie Trinh (2), Aurélie Herrmann (3), Linda Ramseyer (3), Gérald Roul (3), Patrick Ohlmann (1), Olivier Morel (3), Michel Chauvin (3)
(1) Hôpitaux Universitaires de Strasbourg, Strasbourg, France - (2) Hôpitaux Universitaires de Strasbourg, Fédération de Cardiologie, Strasbourg, France - (3) Pôle d'activité médico-chirurgicale cardiovasculaire, NHC, Strasbourg, France

Background: Cardiac resynchronisation therapy (CRT) has been shown to improve clinical status in heart failure patients. Some patients treated by CRT fail to respond to the treatment. Predisposing factors for non-response should be investigated to optimize patient selection.

Objective: The purpose of the study was to evaluate before device implantation and 3, 6 and 12 month after, echocardiographic and biological parameters with respect to CRT response.

Methods: Thirty two patients with heart failure (72% of men ; age 66 ± 10 years; 59 % non-ischaemic cardiomyopathy; NYHA III-IV; left ventricular ejection fraction (LVEF) 22.7 ± 6.7 %; QRS width 146 ± 26 ms) were implanted with CRT device and followed during twelve month. Responders

Multivariate analysis OR (IC 95%)	Combined criteria	Total Mortality	Clinical improvement
NYHA IV	4,1 (1.5-12.4)	3.1 (1.2-8.5)	2.5 (1-6.6)
IHD	2,2 (1-4.8)	3.4 (1.5-7.9)	NS
CRT-D	NS	3.2 (1.2-8.8)	NS
Atrial fibrillation	2,7 (1.3-5.8)	2.2 (1-5.1)	NS
No ACEI /ARB	2,7 (0.9-8.8)	NS	NS
Renal failure (creatinine > 10µm/l)	1,1 (1-1.2)	NS	1.2 (1.1-1.3)
Doses of diuretics	NS	1.03 (1-1.1)	NS

▶

(R) were defined as patients with improvement of one or more NYHA functional class, with a significant improvement in quality of life and without episode nor hospitalization for heart failure during follow-up.

Results: 34% of the patients constitute the non-responder group (NR). No difference between R and NR was observed in LVEF, QRS width, NYHA, cardiovascular risk factors nor drug medication. Non-ischaemic dilated cardiomyopathy was significantly more present in R (71% vs 27%; p=0.03). Before CRT, NR had more important left ventricular end-diatolic diameter, left ventricular end-systolic diameter and more elevated left pressions. Atrioventricular dyssynchrony was significantly more observed in R (66% vs 9%; p=0.006) so as intraventricular dyssynchrony (95% vs 27%; p=0.001).BNP is significantly more elevated in NR (602± 385 vs 320± 361; p=0.03) before CRT.After 3 and 6 month, a significant decrease in left ventricular end-diatolic and end-systolic diameters, LVEF and normalisation of left and right pressions occur in R. Likewise, BNP levels were lower in R.

Conclusions: NR patients have before implantation a more severe cardiomyopathy. At follow-up, left ventricular remodelling could only be observed in R patients. These data suggest that cardiac CRT should not be proposed too late so that left ventricular remodelling could be expected.

197

Reversal mechanical remodeling is associated with reversal of electrical remodeling and reduction in appropriate therapy in patients with cardiac resynchronization implanted defibrillators

Nicolas Lellouche (1), Carlos De Diego (2), Noel Boyle (2), Marmar Vaseghi (2), Jean-Luc Dubois-Randé (1), Kalyanam Shikkumar (2)
(1)CHU Henri Mondor, Fédération de Cardiologie, Créteil, France - (2) UCLA Cardiac Arrhythmia Center, Los Angeles, Etats-Unis

Background: Cardiac Resynchronization Therapy (CRT) is associated with reverse left ventricular (LV) remodeling. However, the effects of CRT induced mechanical remodeling on electrical remodeling, and the occurrence of ventricular arrhythmias has not been clearly established.

Objectives: We studied the relationship between mechanical remodeling, electrical remodeling and the occurrence of appropriate implantable cardioverter defibrillator (ICD) therapy one year after CRT.

Methods: We analyzed data from 45 patients who underwent ICD-CRT implantation at our center. Patients had New York Heart Association (NYHA) functional class III or IV heart failure symptoms, left ventricular ejection fraction (LVEF) 35%, and QRS duration 120 ms or QRS <120ms with left intraventricular dyssynchrony. Significant LV reverse remodeling was defined by a minimum 10% decrease in the LV end diastolic diameter (LVEDd) at one year of follow-up. Electrocardiographic indices of dispersion of repolarization (DR) (QTc, Tpeak-Tend (Tp-e) and their dispersion) were measured immediately and one year post-CRT implantation. The occurrence of appropriate ICD therapy was noted for each patient.

Results: Patients with (n=21) and without (n=24) significant LV reverse remodeling had similar baseline characteristics. At one year of follow-up, patients with reverse LV remodeling exhibited both a significant decrease in DR parameters and a lower rate of ICD therapy (p=0.0025).

Conclusion: Reverse LV mechanical remodeling is associated with reversal of electrical remodeling and a lower rate of appropriate ICD therapy following CRT.

198

Ablation of premature ventricular beats in post-ischemic intractable electrical storm

Philippe Maury (1), Meleze Hocini (2), Frederic Sacher (2), Alexandre Duparc (3), Pierre Mondoly (1), Anne Rollin (1), Marc Delay (3), Pierre Jaïs (2), Michel Haïssaguerre (2)
(1) CHU Rangueil Toulouse, Cardiologie, Toulouse, France - (2) CHU Haut Levêque, Pessac, France - (3) CHU Rangueil, Toulouse, France

Introduction: post-ischemic electrical storm (PIES) occurring shortly after the acute phase of myocardial infarction (MI) is a rare but potentially lethal phenomenon. Clinical and therapeutic options are poorly known.

Methods: 14 pts (12 men, 61 ± 13 years old) underwent RF ablation for intractable PIES. PIES occurred 10 ± 5 days after MI (4 months in one pt). Mean EF was 28 ± 7 %. Fast monomorphic VT (10 pts), FV (8 pts) or torsades de pointes (5 pts) recurred in each pt despite maximal anti-arrhythmic therapy (mean 22 ± 13 episodes). MI was inaugural anterior MI in each but 3 pts (subendocardial in 2, inferior in 1), with one vessel disease (left descending artery) in 8 pts (2 or 3 vessels in 6). When performed (4 pts), new PTCA did not control PIES. RF ablation was performed as a last chance solution, targetting ventricular premature beats arising from the left septal Purkinje network (in all patients the arrhythmia was of Purkinje origin, defined by a sharp spike Purkinje-potential preceding ventricular activation during sinus rhythm as well as during arrhythmia).

Results: Abolition of Purkinje potentials and of Purkinje premature beats led to resumption of electrical storm in 12/14 pts with 1 procedure (2 in one pt). The two pts with unsuccessful RF ablation died within a few hours from intractable heart failure and recurring arrhythmias. All other pts were implanted with an ICD (two pts had already been implanted before). During a 18 ± 19 months follow-up, 3 pts present with recurring isolated VT episodes found in ICD memories. Seven pts died from cardiac or non cardiac causes (7 ± 10 months).

Conclusions: PIES is a rare but potentially lethal event occurring mainly in inaugural large anterior acute MI. RF ablation of initiating Purkinje-premature beats may be an efficient therapeutic solution despite the poor long-term prognosis of such patients.

199

Late outcome of radio-frequency ablation for monomorphic sustained ventricular tachycardia in patients with underlying heart disease without implantation of a defibrillator

Philippe Maury (1), Paolo Della Bella (2), Etienne Delacretaz (3), Frederic Sacher (4), Giuseppe Maccabelli (2), Francesca Baratto (2), Roman Brenner (3), Andrei Forclaz (5), Alexandre Duparc (6), Pierre Mondoly (1), Anne Rollin (1), Marc Delay (6), Meleze Hocini (4), Pierre Jaïs (4), Michel Haïssaguerre (4)
(1) CHU Rangueil Toulouse, Cardiologie, Toulouse, France - (2) Centro Cardiologico, Fondazione Monzino , Milan, Italie - (3) Hôpital Cantonal, Berne, Suisse - (4) CHU Haut Levêque, Pessac, France - (5) CHU Vaudois, Lausanne, Suisse - (6) CHU Rangueil, Toulouse, France

Introduction: Monomorphic sustained ventricular tachycardia (MSVT) in structural heart disease (SHD) carries poor prognosis and usually needs ICD implantation. Whether successful RF ablation of VT in this setting could avoid the need of ICD implantation is largely unknown.

Methods: 105 successive with SHD (88 men, age 64 ± 16) were followed after RF ablation of MSVT. An ICD was not implanted either because of end stage extra cardiac pathology, advanced age or well-tolerated MSVT and preserved EF. 33 % were on amiodarone and 51 % on beta-blockers.

Results: 128 procedures were performed (1,2/pt) in 4 centers. Coronary artery disease was present in 54%, right ventricular dysplasia in 10 %, dilated cardiomyopathy in 10 % and various SHD in 26 %. Mean EF was 48 ± 12 % (14 % with EF ≤ 0,35). VT was well tolerated in 77 % (169 ± 32 bpm) with syncope or near-syncope in 23 %. 11 % presented with electrical storm. Ablation was performed using various techniques and end points. Complete acute success was considered achieved in 80 % and undetermined in 5 pts. Not any VT was induced in 92 % at the end of the procedure. Complications were arterial dissection/occlusion (2 pts), tamponnade (1 pt), AV block (1 pt) and hematomas (4 pts). Patients were discharged on beta-blockers (63%) and amiodarone (29%). Mean follow-up was 21 ± 16 months. VT recurred in 14 % (7 ± 5 months) without compromise of the vital status. Mortality rate was 11 % (no SD) (16 ± 15 months). Additional RF ablations were performed again in 14 pts with recurring VT and VT further recurred in 4 while SD occurred in 2. Final VT recurrence rate including redo precedures was 14 %. An ICD was finally implanted in 5 pts. There was no difference in VT recurrence rate according to the cardiopathy, clinical variables, EF, VT rate and tolerance or to residual VT inducibility.

▶