Gastroparesia as a frequent complication after extensive left atrial ablation for atrial arrhythmias: a consecutive series of 100 procedures

Bénédicte Godin (1), Antoine Milhem (1), Arnaud Savouré (1), Guillaume Savoye (2), Stephane Leclere (2), Michel Antonietti (2), Frédéric Anselme (1)
(1) CHU Rouen, Service de cardiologie, Rouen, France – (2) CHU de Rouen, Service de gastro-entérologie, Rouen, France

Purpose: Various gastro-intestinal complications have been reported after atrial fibrillation (Afib) radiofrequency (RF) ablation. The purpose of this study was to prospectively evaluate the incidence of esogastic injuries after Afib RF ablation.

Methods: Between June 2007 and April 2009, all patients (pts) in whom Afib/left atrial flutter RF ablation was performed, underwent a systematic upper gastro-intestinal endoscopy 24 hours after the procedure. Endoscopic findings were classified as likely related to the procedure, potentially related or unrelated.

Results: 100 ablation procedures were performed in 77 pts using a 4 mm irrigated-tip RF catheter with temperature set to 45°C. Ablation consisted in antral isolation of pulmonary veins (PV1) in 63 cases (63%; maximum power: 30W), associated with creation of roof and left isthmus lines in 14 (14%;35W), and additional left atrial fragmented electrograms ablation in 23 (23%;35W). Esogastric endoscopy found gastroparesia in 6 cases (6%), considered as likely related to the ablation and due to vagal injury. Among these cases, 4 had left atrial fragmented electrograms ablation (p<0.001). In 3 PV1 cases (3%), localized esophagus erythema was also considered as likely related to the ablation procedure. In 5 cases with either Mallory Weiss-like syndrome (n=3) or circumferential esophagus erythema (n=2), RF induced lesions could not be fully ruled out. In 3 cases, esophageal lesions were likely due to pre-operative trans-esophageal echocardiography (2 hematomas and 1 proximal ulceration). In 45 cases (45%), endoscopic abnormalities were considered as unrelated to the ablation (gastritis, n=18; Barret’s esophagus, n=7; hiatal hernia, n=14). Endoscopy was normal in 43 cases (43%).

Conclusions: In this prospective study, the incidence of asymptomatic esogastric injuries likely related to RF ablation was fairly high (9%). Gastroparesia was the main complication and was significantly associated with extensive left atrial ablation.

Long-term monitoring of 340 patients with a cardiac resynchronisation therapy: comparing CRT-P and CRT-D and evaluation of responders

Nicolas Dernede (1), Peggy Jacon (1), Adama Kane (1), Blandine Mondebert (1), Marc Hero (2), Pascal Defaye (1)
(1) CHU Grenoble, Grenoble, France – (2) Medtronic France, Boulogne

The main objective of this retrospective study is to analyze the future of heart failure patients, refractory to optimal pharmacological treatment, implanted by a system of bi-ventricular pacemaker (CRT-P) or defibrillator (CRT-D).

Methods: 340 patients were implanted between the 1st January 1999 and 31 December 2007, aged 69 +/-10 years mainly men (80%). The total population presented in part ischemic heart disease (56%), NYHA class III (79%) and an indication of primary prevention (76%). The number of hospitalization in the 6 months prior to implantation is an average of 1 +/-1. The population was divided into 3 groups:
Group 1: 49 patients implanted with a CRT-P before March 2003,
Group 2: 84 patients implanted with a CRT-P after March 2003,
Group 3: 207 patients implanted with a CRT-D after March 2003.

Results: For all 3 groups combined rate of responders was 75%, with a reduction in particular, the NYHA class (p<0.001), number of hospitalizations (p<0.001) and an increasing LVEF (p<0.001)

The curves of Kaplan-Meyer shows that there is a significant difference between curves CRTP and CRT-D curve, with a survival rate higher with the CRT-D (Logrank:: Group1 vs. Group 3 p<0.01 and Group 2 vs Group 3 p<0.05).

Discussion: Treatment with bi-ventricular stimulation shows that 75% of patients are improved compared to the criteria usually measured. It appears that treatment with CRT-D provides a survival rate more important for a population significantly younger (66 +/-10 years).

Prevalence and Risk Factors Related to Infections of Cardiac Resynchronisation Therapy Devices

Cécile Romeo-Bouchard, Antoine Da Costa, Laurence Bisch, Lyla Khiriss, Karl Isaac.
CHU de Saint Etienne, Cardiologie, Saint Etienne, France

Background: Device related infections [DRI] are not well understood in patients implanted with a cardiac resynchronization therapy [CRT] device.

Objectives: The aim of this study was twofold: [1] to evaluate the prevalence of CRT DRI; [2] to analyze the predictive factors of CRT DRI.

Methods and Results: From January 2001 to May 2007, CRT implantation was obtained in 303 pts. The mean follow-up was 31±19 months. Population characteristics were: mean age of 70±10 years old; 56 female; aetiology [202 dilated and 101 ischemic cardiomyopathy]; NYHA class 3.2±.3; LVEF [26±6%]; QRS [171±31] ms. Thirteen patients developed a DRI: endocarditis in 4, pocket erosion in 3, pocket abscess in 5 and septicaemia in 1. The prevalence of DRI was 4.3%. By univariate analysis, predictive factors of DRI were: procedure time [skin to skin: median of 85 vs. 57.5 min; p= .03], reintervention [54% vs. 6.5%; p <.0001], hematoma [31% vs. 8.6%; p= .01], lead dislodgment [23% vs. 6.2%; p= .03], dialysis [23.1% vs. 1.72%; p= .003] and procedure type [CRT ICD [8.6%] vs. CRT PM [1.6%] or up-grading procedure [1.5%]; p= .03]. Four independent predictive factors of DRI were identified: procedure time [p= .0002]; dialysis [p= .001]; reintervention [p= .006] and procedure type [CRT ICD vs. other procedures; p= .01].

Conclusions: This study found that the prevalence of CRT DRI is close to 4.3% at 2.6 years [1.7% per year incidence], Four independent predictive factors of infections were identified including reintervention, procedure time, dialysis, and primo CRT-ICD implantation. These parameters should be part of the risk-benefit evaluation in patients selected for CRT’s implantation.

Follow-up of Brugada syndrome patients without implantable cardioverter-defibrillator: the “Achilles’ heel” of current studies?

Hôpital cardiological de Haut lévéque, Pessac, France

Risk stratification for sudden cardiac death in asymptomatic Brugada syndrome (BS) patients is not perfect. Although follow-up of patients with an implantable cardio-defibrillator (ICD) is reliable, follow-up for patients without an ICD is less accurate.

Method: All patients seen at the Bordeaux CHU between 1999 and 2009 with BS (spontaneous type 1 or after flecainide or ajmaline test) were included prospectively in the database, i.e. 187 patients (76 % men, 44 +/-2 years). Follow-up of non-implanted patients was carried out by consultation or annual
phone contact. All patients seen over the last 6 months were recontacted for this study.

**Results:** One hundred and two patients (55% BS, 76% men, 43 ±13 years) did not have an ICD. In 50% of cases the BS had been discovered by chance, after lipothymia or syncope in 32% of cases and during family assessment in 18% of cases. A spontaneous type 1 was present in 68%. Electrophysiologic Study (EPS) had been carried out in 79% of patients (Negative in 75 pts and positive in 5pts who had refused the ICD).

Average follow-up was 52 ±37 months, and no subject was lost to follow-up (follow-up=6months for all patients), 89 were asymptomatic, 7 presented with lipothymia, 1 with syncope (without arrhythmia on loop recorder), 1 had supra-ventricular tachycardia and 3 had died (septic shock, overdose, and one young patient called in for a family assessment died suddenly, even though his EPS was negative).

**Conclusions:** After an exhaustive 4.3 year follow-up, 3/102 patients with BS and with no ICD had died, 1 suddenly, despite following risk stratification recommendations.

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Remote implantable cardioverter-defibrillator monitoring in a Brugada Syndrome population: a case-controle study

Alexandre Maluski (1), Frederic Sacher (1), Vincent Probst (2), Maider Hocini (1), Michel Haissaguerre (1), Hervé Le-Marec (2), Jacques Clementy (1)

**Background:** The diagnosis of Brugada Syndrome (BS) is typically made in a young otherwise healthy population. In patients with high risk of sudden cardiac death (SCD), the only recommended therapy is an implantable cardioverter defibrillator (ICD), but this can lead to complications. Previous studies have shown that the rate of complication related to ICD is important in this population because young and socio-professionally active. The remote monitoring may simplify or improve their follow-up by checking daily the device system.

**Methods:** Thirty-five consecutive patients (26 males, 44±11) were implanted for BS with an ICD with a remote monitoring system (Home Monitoring (HM) Biotronik). They were matched for age, sex and follow-up duration with 35 BS patients implanted with an ICD without this capability.

**Results:** During a mean follow-up of 2.5 years, the use of remote monitoring reduced significantly by 67% the number of cardiology consultations (3 ±2 vs 7 ±3, p<0.001). The HM system induces an economic of 192 € per patient per year. This early detection of abnormality may have prevented one or several inappropriate shocks in 11% of HM patients (48%) had moved to consult only one or twice during this follow-up. So they can maintain a social and professional normal life.

**Conclusions:** Remote monitoring simplifies the follow-up of these young otherwise healthy patients by decreasing significantly the number of cardiology consultations. Remote monitoring optimizes the follow-up with early detection of failures that could potentially be complicated by inappropriate shocks.

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Complete atrioventricular block during ablation of atrial flutter. Incidence and causes

Béatrice Bremilla-Perrot, Mourad Lemdersi-Filali, Pierre Yves Zinzius, Pierre Louis, Lucian Muresan, Sonia Magalhaes, Arnaud Terrier De La Chaise, Olivier Selton, Olivier Claudon, Etienne Alliot, Mariad Andronache, Ahmed Abdelaal, Simona State, Daniel Beurrier, Fabrice Duhoux

CHU of Brabois, Cardiologie, Vandœuvre Les Nancy, France

Radiofrequency (RF) ablation of typical atrial flutter (AFI) is largely used to restore and maintain a sinus rhythm. Little is known on the risk of a third degree atrioventricular block (AVB). The purpose of the study was to evaluate the incidence and the causes of iatrogenic complete AVB during RF ablation of a typical AFI.

**Population:** AFI ablation was performed in 763 patients (pts), 606 males, 157 females aged from 18 to 90 years (64±12) with recurrent or bad-tolerated typical AFI; 330 pts had associated significant heart disease (valvular 68, congenital 24, ischemic heart disease 71, dilated cardiomyopathy 43, miscellan- neous 78) or chronic pulmonary disease (46).

**Methods:** AFI RF catheter ablation was performed by conventional method with setting a HALO catheter in coronary sinus and using an 8-9 quadripolar with an 8 mm-tip electrode catheter; a maximum power of 70 w and a maximum target temperature of 70°C was used. Obtaining a sinus rhythm and a complete isthmus block was the objective of the procedure.

**Results:** Complete AVB (1%) was noted when sinus rhythm was restored, in 8 pts aged from 59 to 89 years (73±9) significantly older than other pts (63.5±13) (p<0.02); 2 AVB’s were accidental, related to His bundle damage and remained permanent; 2 AVB’s were regressive and related to a traumatic block in pts with left bundle branch block; one AVB appeared after interruption of class I antiarrhythmic drug; 3 AVB’s were of ischemic origin in pts with known coronary heart disease; in 2 of them ST segment elevation and AVB resolved with antiarrhythmic therapy; in one 59 year old man, AVB was related to an acute occlusion of the segment 3 of the right coronary artery. His recanalization by initial balloon angioplasty and stent implantation was associated with the immediate restoration of a normal AV conduction.

**Conclusions:** Complete AVB was a rare complication of RF ablation of typical atrial flutter (1%) which concern old pts; it is significantly more frequent in pts with ischemic heart disease (3/71, 4%) than in pts without ischemic disease (p≤0.05). This ischemic AVB is regressive after the immediate treatment of acute coronary syndrome.

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Analysis of HCN4 channel function using two conditional transgenic mouse strains

Anne Rollin (1), Mesirca Pietro (1), Matteo Mangoni (1), Joel Nargeot (1), Dirk Isbrandt (2), Heimo Ehmke (2), Jacqueline Alig (2)

**Background:** The hyperpolarization-activated cyclic nucleotide gated channel, particularly HCN4 subunit, is considered as a major pacemaker channel in the sino-atrial node. However, the relative extent of heart rate remains the same for all mouse strains.

Our results show that in the two strains heart rate is reduced by the same percentage with respect to the wild type. During pharmacological sympathetic stimulation the maximal heart rate was lower in the two transgenic strains than in wild type, but the relative extent of heart rate remains the same for all mice.

Our data confirm the importance of HCN4 for cardiac pacemaking both at rest and during sympathetic stimulation, and that the presence of cAMP is essential for HCN4 function. Moreover, our results seem to indicate that this channel is not indispensable for heart rate autonomic regulation.