Per-operative evaluation of adding second left lead on very dilated patients

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Introduction: Patients with very dilated left ventricle are less responder to CRT. We evaluate implant process and per-operative impact of adding a second LV lead in this population.

Methods: We consider 15 patients with CRT-D indication and EDELVD ≥70 mm.

Additional time for 2nd LV lead was limited to 40 minutes. Per-operative impact was evaluated using an external hemodynamic sensor influenced by cardiac contractility (PEA sensor). LV 1 is the postero-lateral one, the LV2 is the high lateral or diagonal one. All patients with successful implantation were discharged in Triv pacing mode.

We evaluate the best configuration (regarding contractility) for each LV lead (BIV or LV only pacing mode). Comparing both configurations we define the optimal lead, and the non-optimal one.

We compare these two configurations with the best configuration using the two left ventricular lead (Triv pacing or dual left pacing) called the “optimal dual left configuration”.

Results: 13 pts were successfully implanted with 2 LV leads (mean additional time=25 mins. [9-40]).

For 7 cases the optimal left lead is the postero-lateral one, for 6 it was the high lateral or diagonal.

The “Optimal dual left configuration” upgrades the hemodynamic value for more than 40% (41% [-2; 115]) compared with the non optimal lead, and up to 10% (12% [-9,39; 41,82]) compared with the optimal one. 713 patients have more than 10% of increase compared with optimal LV lead and the positive impact of using the two LV lead is confirmed (TRIV vs Optimal >0, p<0,005).

Choosing the optimal lead versus the non optimal one (40%) is statistically superior than using the optimal dual left configuration versus the optimal lead only (10%) (sign test p=0.0005).

Conclusions: In patients with dilated left ventricle, adding a second LV lead ensures having the benefit of the best positioned left lead, and dual left configuration adds an additional acute benefit over standard CRT.

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The management of preexcitation syndrome remains to be improved.

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Guidelines recommend the electrophysiological evaluation of preexcitation syndrome (PS) and report the indications of accessory pathway (AP) ablation and the use of antiarrhythmic drugs for the treatment of supraventricular tachycardias (SVT). PS-related adverse presentation defined as a documented life-threatening haemodynamically not tolerated arrhythmia, should disappear.

The purpose of the study was to evaluate the prevalence of adverse events in patients with known PS and their cause.

Methods: Adverse presentation occurred in 65 patients between 1990 and 2010 among 735 patients aged from 5 to 85 years (34.5±17), consecutively recruited for a PS. Electrophysiological study (EPS) was systematic.

Results: The prevalence of adverse event was 8.5%. It was the first event of the disease in 36 patients who had never ECG recording nor symptoms before malignant arrhythmia (group I); 21 patients had symptoms of tachycardia but no ECG was recorded and PS was unknown (group II). PS was known but was not studied in 8 patients (group III); adverse event occurred after heavy surgery (n=3), after use of calcium inhibitors (n=4) to treat spontaneous SVT and use of salbutamol (n=1). At EPS all group I and II patients but 3, had the criteria of a malignant form of PS (maximal rate through AP>240 bpm in control state, >300 bpm after isoproterenol in AF). In group III, only 5 of 8 had the electrophysiological criteria of malignancy. Malignant form at EPS was less frequent in group III than in group I and II (p=0.005).

Conclusions: EPS which should be systematic, because malignant form was generally noted in asymptomatic or symptomatic patients with a PS who presented a poorly-tolerated arrhythmia or a ventricular fibrillation. However the risk can be underestimated in patients who will have a heavy surgery.

More, the management of PS remains to be improved, because some adverse events are related to classically contraindicated drugs as calcium inhibitor used to treat SVT.

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Effect of pacing mode preserving spontaneous AV conduction on ventricular pacing burden and atrial arrhythmias

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Introduction: Transvenous ventricular pacing (VP) has been traditionally performed from the right ventricular apex (RVA) because convenience of pacing electrode positioning and long-term pacing stability. Recently, the adverse effects of pacing RVA have emerged. An increase in cumulative percentage of RVA pacing in patients treated with pacemakers results in increased risk of heart failure hospitalization, and atrial fibrillation (AF).

To decrease the adverse consequences of RVA pacing, currently two strategies are proposed: 1) substitute other VP sites, (right ventricular septum or left ventricle), 2) use dual-chamber pacemakers with new function: Manage Ventricular Pacing (MVP™) which operates in AAI/R mode with backup VP during AV block (AVB).
Aim of this study is to assess the rate of VP and atrial arrhythmias (AA) according to indication of pacing and programming MVP function during long term follow-up.

Methods: The multicenter observational Generation MVP study included 264 patients aged 77±10 years (men: 52%) implanted for sinus node dysfunction (SND) (n=141) or AVB (n=123). Programming function MVP has been left to the discretion of the physician. Percentage of VP and percentage of patients with paroxysmic or persistent AA was assessed on average at 2 and 10 months according to the indication of pacing and the state of programming MVP function.

Results: Percentage of VP at 2 and 10 months is significantly lower for the 2 groups of indication for patients with MVP function activated [On] compared with patients without MVP function [Off]. AA burden at 2 and 10 months was significantly lower when the MVP function is programmed [On] in AVB and SND groups.

Conclusions: For this study performed in current practice, at 2 and 10 months follow-up, programming MVP function is associated with a significant decrease of VP for SND and AVB indications. Moreover programming function MVP is associated with a significant decrease of AA burden at each time and each indication.

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Lack of complete right inferior pulmonary vein isolation during cryoballoon AF ablation is a predictor of mid-term AF recurrences
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Introduction: Pulmonary vein isolation (PVI) using cryotherapy has emerged as an interesting alternative to radiofrequency PVI in patients with paroxysmal atrial fibrillation (AF). However, recurrences of AF are still common using cryotherapy. The objective of this study was to search for predictors of mid-term AF recurrence after cryoballoon ablation of AF.

Methods: In 55 consecutive patients with symptomatic paroxysmal AF (36 males, age 56±10 years), circumferential PVI was performed using a cryoballoon catheter. At 4 months follow-up, patients underwent clinical review and 24-hour Holter recordings. Clinical and demographic variables were analyzed via logistic regression to assess for predictors of recurrence.

Results: Among the 55 patients, 46 had complete isolation of all PVs (84%). Out of 220 treated veins, 14 were incompletely isolated (6%). At a mean follow-up of 4.1±1.5 months, freedom from tachyarrhythmia was observed in 35 patients (64%, success group), whereas 20 patients had recurrence of tachyarrhythmia (36%, failure group). Among these 20 patients, 15 had AF, 4 had atrial flutter and 1 patient had atrial tachycardia. Of all clinical variables analyzed, incomplete isolation of the right inferior PV, mean CHADS2 score and early recurrence of AF within 4 days post ablation were predictors of mid-term AF recurrence (p<0.008, 0.03 and 0.04, respectively).

Conclusions: Cryoballoon PVI can be safely achieved with an acceptable success rate at 4 months follow-up. Early recurrence of AF within 4 days post ablation seems to be a predictor of mid-term AF recurrence. Although right inferior PV is the most challenging vein to isolate because of its anatomical relationship with the interatrial septum, its complete isolation seems to be an important parameter to achieve mid-term clinical success.

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Prevalence of intraventricular conduction disturbances in a large population of aircrew members
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Background: The interpretation of QRS variation and duration in ECG was newly standardized in 2009 by the American Heart Association. The aim of this study was to define the prevalence of intraventricular conduction disturbance (IcoD) in a population of Aircrew Members (AM) using these recommendations.

Methods: AM (military and civilian jet and transport crew) are periodically examined for fitness assessment at the same health care center (CPEMPN) with a standard 12-leads ECG at each visit. ECG is computerized, analysed by one physician and then stocked in a data base. All the ECG with IcoD were extracted from the data base using Tracemaster ECG system. All these ECG were reviewed independently and blindly by a junior and a senior physician, compared with an equal number of normaly defined ECG to validate the computerized extraction.

Results: From 01/01/1996 to 09/30/2010, 45 160 AM [67.6% male, mean age (ma):36.8 yo +/- 11 y, range 17-77 yo] were examined, 222 867 ECG were recorded. The reviewed 12-leads ECG revealed 792 Incomplete Right Bundle branch Block [1,75% ma: 32,8 yo, 95,4% male,2,48%], 4,6% female (0,25%)]; 203 Complete Right Bundle Branch Block [0,45% ma: 41 yo, 94,1% male (0,63%), 5,9% female (0,08%)]; 760 Left Anterior Fascicular Block [1,68% ma: 40,3 yo, 88% male (2,19%), 12% female (0,6%)], 88 Left Posterior Fascicular Block [0,19% ma: 31 yo, 77% male (0,22%), 23% female (0,14%)]; 56 Complete Left Bundle Branch Block [0,12% ma: 50 yo, 75% male (0,14%), 25% female (0,1%)].

Conclusions: This study is the first prevalence study using the new standard of interpretation of ECG for a large population. However, IcoD remain a situation of high importance in this particular population (including fighter pilot) because this may be caused by structural abnormalities in the heart conduction system or ventricular myocardium and thus may impact the flight safety.

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Prevalence and prognosis impact of early repolarisation pattern in a general population
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Background: Early repolarisation pattern (ERP) is characterized by an elevation of the QRS take-off (J point) in the inferior and/or lateral leads on the 12 lead surface electrocardiogram (ECG). We aimed to determine the prevalence of ERP in a large population-based cohort study and to determine association between ERP and all-cause mortality.

Methods and results: We assessed the prevalence of ERP by recording ECG in 1163 southwestern French men (609) and women (560) aged from 35 to 64 years within the Third French MONICA Survey. The presence of ERP, determined by an elevation of the J point at least 1mm in two consecutive leads excluding leads V1 through V3 was ascertained by two trained cardiologists. The primary end point was total mortality. Mean follow-up was 13.3 years. ERP attributable impact on mortality was determined by a Cox proportional hazard model adjusted for covariables.

Results: ERP was found in 157 subjects (13.3%): 78 (6.7%) in inferior leads, 39 (3.3%) in lateral leads, and 37(3.1%) in both inferior and lateral leads. 76(6.4%) presented a slurring pattern of ERP and 83 (7.1%) a notching pattern. Prevalence of ERP was higher in men than in women (20.4% vs 5.7%; p<0.02). Whereas the prevalence of ERP decreased with age in males (35-44 y: 26.5%, 45-54y: 21.3%, 55-64y: 13.7% p=0.006), it was stable in women (35-44y: 5.7%, 45-54y: 4.1%, 55-65y: 7.3% p=0.39). Because of a significant sex-ERP interaction with mortality (p<0.02), we performed analysis in men and women separately. ERP was significantly associated with all-cause mortality only in women with a hazard ratio after adjustment for age and resting heart rate of 4.18 (95% confidence interval 1.55-11.3, p=0.005). HR for men was 1.46 (95% CI 0.72-2.98, p=0.29).

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