

Topic 18 – Electrophysiology, rhythmology and pacing – C

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0259

Mapping of electrical activity in intact sheep atrial preparation

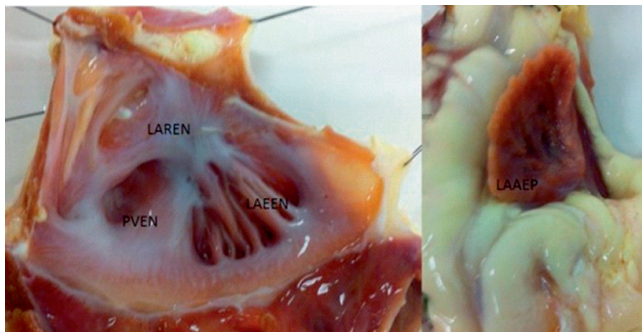
Caroline Pascarel-Auclerc, Richard Walton, Mèlèze Hocini, Olivier Bernus
IHU LIRYC, Bordeaux, France

It is well-established that pulmonary vein (PV) ectopic activity is the trigger for paroxysmal atrial fibrillation (AF). However, the role of electrophysiological and structural heterogeneity in the genesis and maintenance of AF following PV ectopy are still relatively unknown.

In this preliminary study, we report on an optical mapping study to determine the structure-function relationship and electrophysiological heterogeneity in left atrial vs PV tissue. Optical mapping experiments were performed in circumflex artery-perfused left atrial preparations from sheep. The atria were paced on the endocardial surface (n=5) between 0.5 to 6Hz. Action potential duration (APD) was measured from four different regions of interest (ROI): LAAEN (left atrial appendage), LAREN (left atrial roof) and PVEN (pulmonary veins ostium) on endocardial surface and from LAAEP (left atrial appendage) on epicardial surface.

During pacing of the endocardium, no significant APD differences were observed between the four ROIs, except at a basic cycle length of 400 msec where the pulmonary vein region displays shorter action potentials than the (LAAEN: 209.58±17.04 msec and PVEN: 184.23±14.19 msec, P<0.05). In addition, preliminary results also show that AP forms are heterogeneous. The action potential upstroke is slower in PVEN rather than in LAAEN.

In conclusion, our results indicate electrophysiological heterogeneity in the intact sheep left atrium which may contribute to the mechanisms underlying the genesis and maintenance of AF.



Abstract 0259 – Figure: Circumflex artery-perfused left atrial preparation

0357

Two-dimensional speckle-tracking imaging for the left atrial and ventricular function in patients undergoing atrial fibrillation ablation

Laurence Jesel (1), Annie Trinh (2), Amandine Rocha (3), Han S Lim (4), Malak Abbas (5), Hafida Samet (3), H  l  ne Petit-Eisenmann (3), Paola Di Marco (3), Patrick Ohlmann (1), Olivier Morel (3)

(1) H  pitaux Universitaires de Strasbourg, Strasbourg, France – (2) H  pitaux Universitaires de Strasbourg, F  d  ration de Cardiologie, Strasbourg, France – (3) NHC, P  le d'activit   m  dico-chirurgicale cardiovasculaire, Strasbourg, France – (4) Cardiologie, Bordeaux, France – (5) EA

7293 Stress vasculaire et tissulaire en Transplantation, Univerist   de Strasbourg, Strasbourg, France

Introduction: Left atrium (LA) structural remodeling associated with atrial fibrillation (AF) contributes to recurrence after AF catheter ablation (CA). Characterizing LA function may be useful to identify patients with higher risk of recurrence and could guide ablation strategy in term of substrate modification. We aimed to identify predictors of recurrence and atrial remodeling by assessing LA and left ventricle (LV) deformation properties using two-dimensional speckle-tracking imaging before and after AF CA.

Methods: 62 patients (age 54±10 years, 90% male) with AF (45 paroxysmal (PAF), 17 persistent (PsAF)) underwent an echocardiography before CA, 3 and 6 months after CA to assess LA strain (S total (S-tot), positive peak (S-pos), negative peak (S-neg)), LA strain rate (SR positive peak (SRs), early (SRe) and late negative peak (SRa)) and LV strain (LV longitudinal and radial S).

Results: PsAF patients baseline had significantly larger LA volumes (41±8 vs 32±10 ml/m²), decreased S-tot (10±5 vs 20±6%; p<0.001), SR-LAs (0.6±0.2 vs 1±0.3 s⁻¹; p<0.001) and LV strain (-12±3 vs -16±3%; p<0.001) compared to PAF group. After 6 month follow-up, 69% of the patients remained in sinus rhythm. Baseline LA active emptying, reservoir function and LA S-tot (13.2±6.2 vs 20.1±7%, p<0.001), S-neg (-7.2±3.5 vs -10.6±3.3%, p<0.009), SR-s (0.71±0.3 vs 1.01±0.35 s⁻¹, <0.004), SR-a (-0.89±0.56 vs -1.37±0.48 s⁻¹, p<0.01) and LV strain (-13.5±4.8 vs -17.1±3.5%, p<0.003) were significantly decreased in patients with AF recurrence. At multivariate analysis, the unique independent predictor of sinus rhythm maintenance was LA S-tot (HR 0.819 (0.685-0.979), p=0.028). In the overall cohort, LA volumes decreased from baseline to 3 and 6 months but there was no significant change in LA S, LA SR nor LV strain. At multivariate analysis, the unique independent predictor of LA reverse remodeling after CA was the duration of AF history (HR 0.84 (0.73-0.96), p=0.013).

Conclusions: Altered global LA and LV strain before CA is associated with AF recurrence. Echocardiographic LA function characterization before ablation procedures may be helpful to guide AF ablation strategy and drug management after CA.

0450

Silent atrial fibrillation after ischemic stroke: interest of continuous ECG monitoring

Vanessa Fernandez (1), Zeller Marianne (1), Yannick Bejot (2), Joelle Hamblin (1), Maud Maza (1), Claude Touzery (1), Yves Cottin (1), Maurice Giroud (2)

CHU Dijon, Cardiologie, Dijon, France – (2) CHU Dijon, Neurologie, Dijon, France

Background: Atrial fibrillation (AF) is a major etiological factor of ischemic strokes (IS). Recent data suggested that subclinical, i.e. silent AF, assessed at the acute phase of stroke by Continuous ECG Monitoring (CEM) is frequent, and associated with a worse prognosis. The aim of our study was to investigate the incidence and determinants of silent AF in patients with acute IS.

Methods: All consecutive patients admitted on the stroke unit of CHU DIJON for IS or TIA were prospectively enrolled from March to December 2012. Patients with a history of AF or who experienced symptomatic AF during their hospital stay were excluded. Silent AF was assessed by CEM for 24h after admission and defined as at least 1 episode >30 sec without p waves, and with irregular RR intervals. An echocardiography was performed at 2±1 d to measure left ventricular ejection fraction (LVEF) and left auricular (LA) dimensions.

Results: Among the 187 patients included, 19 (10%) developed silent AF. Patients with silent AF were markedly older (76 vs. 66 years, p<0.002), with lower creatinine levels (90 vs. 80 μmol/L, p=0.030) and were less often smokers (5 vs. 41% p=0.058) than patients without silent AF. They also showed a trend towards more frequent hypertension (79 vs. 58%, p=0.057) and a recent history of infection (16 vs. 5%, p=0.082). There was no difference for chronic treatments, NIHSS score on admission, maximal heart rate (HR) or diabetes. By backward multivariate analysis, only age remained an independent estimate of silent AF. For echocardiographic measurements, patients with silent AF showed a trend towards a larger indexed LA volume (37.4 vs. 30.8 ml/m²), p=0.057) and LA diameter (23.2 vs. 20.8 mm/m², p=0.059); LVEF was similar for the two groups (59 vs. 59%, p=0.582).