295 Decreased fractional area change of left atrial appendage contributes to development of persistent atrial fibrillation in patients of lone paroxysmal atrial fibrillation


Background and Purpose: Atrial fibrillation (AF) is a progressive arrhythmia and with time, paroxysmal AF (Paf) becomes persistent. But it is uncertain whether self-terminating episodes of paroxysmal AF after atrial mechanical function during normal sinus rhythm. This study was designed to assess the initial left atrial (LA) mechanical changes after episode of PAF with thoracoscopic (TTE) and transesophageal echocardiography (TEE) that predict development of persistent AF.

Methods: Twenty-six consecutive patients (mean age, 59±10.6 years; 12 males) with newly diagnosed lone AF (mean duration of symptom, 2.6 days; range: 1 day-10 days) who converted to sinus rhythm spontaneously were studied prospectively. TTE and TEE were performed after 1-2 days of spontaneous sinus conversion and parameters associated with LA function and dimension were measured including LA and left atrial appendage (LAA) Fractional area change (FAC) (figure), fractional shortening (FS), ejection force (EF) and P wave to LAA ejection interval. The patients were followed up for the recurrence of AF after a year.

Results: AF recurred in 11 (42.3%) patients after a mean time of 12 (±4) months. FAC of LAA was significantly lower in patients with AF recurrence (52.1±6.2% vs 49.3±20.5%, p<0.01) and multiple regression analysis indicated that FAC of LAA was an independent predictor of AF recurrence. Multiple regression analysis revealed no significant differences in LA size parameters or in clinical and LA mechanical function parameters including LA fractional shortening and ejection force recorded after restoration of sinus rhythm between patients with and without AF recurrence.

Conclusion: FAC of LAA may be considered as an independent predictor of development of recurrent and persistent AF.

296 Acute left atrial reverse remodeling after pulmonary venous ablation: evaluations with tissue Doppler myocardial velocities

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Non-invasive evaluation of left atrial (LA) function is challenging due to limitations in current methods. Tissue Doppler (TD) late/Am) velocities have been shown to be an alternative means of assessing LA function.

Aim: To assess LA function with TD in patients with paroxysmal atrial fibrillation (Paf) at baseline and after radiofrequency (RF) ablation of pulmonary veins.

Methods: We assessed 28 consecutive patients (24 male, aged 53±2.4 years) with normal left ventricular (LV) ejection fraction (EF) referred for catheter ablation. Patients underwent standard echocardiographic and TD measurements at the lateral and septal mitral annulus at baseline and 24 hours post-ablation. LAEF estimated from LA volumes (apical 2 and 4 chamber) was given as the ratio of maximal LAEF to systolic strain (LAe).

Conclusion: LAe, LAsSR, SEPe, SEPsSR, RAe and RAsSR were significantly lower in group A and those with more than 1 year defined as group B. Any difference remained significant in groups A and B and with respect to LA volumes and septal strain rates. The acute decrease in LAEF did not correlate with the number of RF pulses or clinical variables.

297 Echocardiographic evaluation of left atrial mechanical function in patients with paroxysmal atrial fibrillation

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Aim: Latral mechanical function was evaluated in patients with paroxysmal atrial fibrillation (Paf) using conventional and tissue Doppler echocardiography.

Methods: Studied subjects were 55 consecutive patients, aged over 55 years (mean age: 36 years) with paroxysmal AF episodes detected by standard 12-lead monitoring. Significant valvular disease, myocardial disease, and left ventricular (LV) systolic dysfunction were excluded. 20 healthy elders (73±6 years) (N group) and 24 chronic nonvalvular AF (74±8 years) (AF group) served as controls. Percent change of LA diameter (LAD) during cardiac cycle (LA%D), derived from (maximum LAD – minimum LAD)/maximum LAD x 100, obtained from M-mode echocardiography, was an index of LA function. The AF patients were divided into 33 patients with preserved LA function (preserved Paf group) and 22 with impaired LA function (deteriorated Paf group) based on mean value minus 2SD of %LAD (17%) in the N group. The LA volume (LAV) and %LAD were compared among Paf group, N, and AF groups. Absolute systolic velocities of mitral inflow (A1), pulmonary venous flow (A2), and mitral annulus (A2a) were compared between preserved and deteriorated Paf groups.

Results: (1) LAV was larger in the AF group (149±23ml), deteriorated Paf group (129±25ml), preserved Paf group (96±23ml) than in the N group (76±16ml) (p<0.05). %LAD was smaller in the AF group (61±2%), deteriorated Paf group (13±2%), preserved Paf group (21±4%) than in the N group (23±3%) (p<0.05). No significant difference was found in the left ventricular volume and ejection fraction among 4 groups. (2) The A1, A2, and A2a were smaller in the deteriorated Paf group than in the preserved Paf group (A1: 75±17 vs 61±20cm/s, A2: 29±8 vs 21±6cm/s, A2a: 11±3 vs 7±2cm/s). (3) Chronic AF was developed significantly often (p<0.01) in the deteriorated Paf group (11/17 65%) than in the preserved Paf group (1/23 4%) during follow-up period by Kaplan-Meier analysis.

Conclusion: These results suggest that the LA function in patients with Paf may be impaired, and that the degree of LA dysfunction may associate with the chronicity of AF.

298 Atrial strain and strain rate; a novel method for the evaluation of atrial stunning

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We studied 45 patients who had atrial fibrillation (AF) defined group I and compared with group II in which consisted 35 patients. Left atrial systolic strain (La), left atrial peak systolic strain rate (LaSRR), interatrial septum systolic strain (SEPS), interatrial septum peak systolic strain rate (SEPSR), right atrial strain rate (RaSRR) and right atrial peak systolic strain rate (RaSRR-SRR) were calculated at the 1st, 24th hour and 1st month after the restoration of sinus rhythm (SR) in group I and compared with group II. La, LaSRR, SEPS, SEPSR, RaSRR and RaSRR were significantly lower in group I at the 1st, 24th hour of the restoration of SR, but no difference was found end of the 1st month. Patients whose AF persist less than 1 year was defined as group A and those with more than 1 year defined as group B. Any difference was not found between groups at the 1st, 24th hour, but La (6.38±0.45 vs. 5.58±0.45) was significantly lower in group B. Conclusion: The late atrial strain and strain rate is lower in group B than in group I.
4.46±0.34 vs. 1.05±0.03 p=0.02), LAe (11.664-0.32 vs. 6.884-0.32 p=0.02). RAe (1.784-0.22 vs. 2.104-0.08 p=0.04) were significantly lower in group B at the end of the 1st month. LAe (4.46±0.34 vs. 6.45±0.27 p=0.03), LAe (1.05±0.03 vs. 1.35±0.04 p=0.03), RAe (6.88±0.32 vs. 10.12±0.64 p=0.02), RAe (1.78±0.22 vs. 2.10±0.08 p=0.04) were significantly lower in group B than control group at the end of the 1st month, no difference between two groups with the comparison by conventional echocardiographic parameters.

It has been demonstrated that atrial strain and strain rate is useful for the evaluation of atrial stunning in patients with AF whom is restored SR, and is superior to conventional methods to indicate the continuation of atrial stunning in patients with AF persisting more than 1 year. This superiority may be explained by demonstrating atrial contractile functions directly.

299 Transesophageal left atrial appendage function after cardioversion for atrial fibrillation: a long term sign of low thromboembolic risk

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After cardioversion for an atrial fibrillation (AF) episode, a lifelong lasting oral anticoagulation therapy (OAT) has been recently suggested also in patients maintaining sinus rhythm (SR). The aim of the present study is to evaluate if the left atrial appendage (LAA) function studied with transesophageal echocardiography after an AF episode, can identify a group of patients who can safely have a short term antiocoagulation, avoiding the related hemorrhagic risk of lifetime anticoagulation.

Methods: We studied 260 patients in SR, 94 immediately after electric or pharmacologic cardioversion for nonvalvular AF and 166 with 1 to 3 AF episodes in the last 12 months. All the patients were considered at middle/high clinical risk for thromboembolism because of the age, hypertension, ischemic cardiopathy or diabetes. A transesophageal echocardiography was immediately performed in all patients with previous AF episodes and 1 week after conversion to SR in the cardioverted patients. In the absence of thrombi, complex aortic plaques and in the presence of a normal function of the left atrial appendage (LAA), represented by a high (>40 cm/sec) emptying LAA velocity, the OAT was interrupted, otherwise it was continued for at least one month and often for the entire study. The follow up was performed at 2 years (a mean of 19.9±1 months).

Results: The LAA velocity was >40 cm/sec and no other echocardiographic risk factors were present in 148/260 patients. In none of these patients thromboembolic or major hemorrhagic events occurred during the 2 years follow up. Among the 112 patients with LAA velocity <40 cm/sec or other echocardiographic risk factors, 6 thromboembolic events occurred (3 cerebral strokes, 1 peripheral embolism and 2 transitory ischemic attacks). All these patients showed a LAA velocity <25 cm/sec and interrupted the OAT at least 1 mo after SR restoration, according to guidelines (average interruption time after the enrolment in the study was 3.6±1.4 months). Among patients on OAT therapy, 2 major hemorrhages (a cerebral one, leading to death) and 1 minor hemorrhage also occurred.

Conclusions: Among patients in sinus rhythm with a nonvalvular AF, with spontaneous recovery or cardioversion, and a middle/high thromboembolic risk judged with the only clinical history, the presence of a normal LAA function in the absence of thrombi or complex aortic plaques, identifies a group of patients with low thromboembolic risk. These patients could, hence, avoid a long term OAT prophylaxis and its connected hemorrhagic risk.