

# ArrhythmiaNEWS

*From the Arrhythmia Service of St. Luke's-Roosevelt Hospital Center*

*Arrhythmia News* is a physician bulletin providing arrhythmia updates and information on services at St. Luke's-Roosevelt Hospital Center which may benefit your practice and patients.

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## Arrhythmia Symposium

### 13th Annual Diagnosis and Management of Cardiac Arrhythmias

May 21, 2005  
8 am - 1:30 pm

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### Continuous Intra-Cardiac Ultrasound-Guided Left Atrial-Pulmonary Vein Disconnection for Treat- ment of Atrial Fibrillation

The discovery by Haissaguerre and colleagues that catheter ablation of the ectopic triggers of atrial fibrillation (AF) provided the possibility of a cure and freedom of medication in some patients with recurrent atrial fibrillation, and has changed the approach to treating patients with atrial fibrillation. In patients with paroxysmal atrial fibrillation, it was demonstrated that ablation of foci within the myocardial sleeves of the pulmonary veins (PVs) eliminated atrial fibrillation. The evolution of the procedure from ablation of individual foci within the pulmonary veins to empiric isolation of all four pulmonary veins has reduced the rate of atrial fibrillation recurrence and the need for a repeat procedure and reduced the risk of pulmonary vein stenosis.

Today, isolation of the four pulmonary veins by catheter ablation can be achieved by a number of different ablation techniques. The two principal approaches involve segmental ablation of the myocardial bridges connecting the left atrium to the myocardial sleeves in the pulmonary veins or circumferential ablation by the uniform application of energy 360 degrees around the pulmonary vein orifice.

In addition to the relief of symptoms associated with AF, ablation

of the triggers of AF and maintenance of sinus rhythm has been shown to affect cardiac function, exercise capacity and overall quality of life. In a recent paper published in the *New England Journal of Medicine*, Haissaguerre and colleagues demonstrated, in 58 patients, that catheter ablation for AF in patients with congestive heart failure and LVEF < 45% led to an improvement left ventricular function with an increase in ejection fraction by  $21 \pm 13$  percent ( $p < 0.001$ ).

### Improvement in Symptom Control and Cardiac Function

The improvement in ejection fraction was seen in all patients studied, not solely those with inadequate rate control of AF or coexisting structural heart disease. This data suggests that ablation of the triggers of AF and maintenance of sinus rhythm is not only beneficial for symptom control, but affects cardiac structure and function. It also highlights the important contribution of atrial contraction and AV synchrony to the pathogenesis of ventricular dysfunction in patients with AF.

The Arrhythmia Service at St. Luke's-Roosevelt Hospital has extensive experience in the ablation of atrial fibrillation employing the techniques introduced by Haissaguerre. Recently, we have published the results of 170 consecutive patients undergoing ablation for AF, summarizing the safety and efficacy of using intra-cardiac ultrasound (ICUS) and local electrographic-guided pulmonary vein-left atrial disconnection. At the

onset of the ablation procedure, images of each PV were obtained and the diameter at the PV-LA junction measured. ICUS was used to guide transeptal punctures, screen for thrombus adherence to sheaths and to verify the proximal positioning of the ablation and mapping catheters in the PV throughout the procedure.

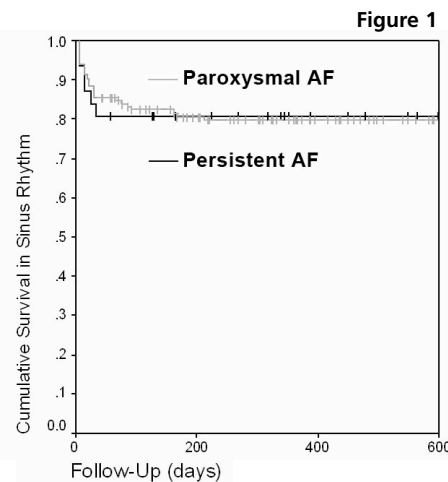
Utilization of ICUS allowed for the visualization and characterization of common PV ostia: left common PVs were present in 43% of patients whereas right common PVs were present in 4%. The isolation of common PVs was accomplished in all cases and required a similar number of radiofrequency applications compared with the isolation of 2 ipsilateral PV ostia.

**Low Recurrence of AF Post-Ablation**

During a mean follow-up period of  $549 \pm 330$  days, only 34 of 170 patients (20%) of patients continued to have recurrent AF. Of those, 24 of 34 (71%) had less frequent and severe episodes with marked clinical improvement in symptoms or maintained normal sinus rhythm on previously ineffective medical therapy. The overall long-term maintenance of sinus rhythm and freedom from AF on no medical therapy was 80% and symptomatic reduction was achieved in 94% of the patients. Importantly, the complication rate was extremely low with no patient suffering a TIA,

stroke or thromboembolic event and no significant PV stenosis detected during the follow-up period.

Of the 170 patients in this series, 139 patients (82%) had paroxysmal AF and 31 (18%) had persistent AF. Patients with persistent AF had shorter overall histories of AF ( $1.7 \pm 2.1$  vs.  $6.9 \pm 7.7$  years,  $p < 0.001$ ) and larger PV diameters measured by ICUS ( $1.54 \pm 0.5$  cm vs.  $1.44 \pm 0.4$  cm,  $p = 0.05$ ) than patients with paroxysmal AF. After discontinuation of antiarrhythmic drugs, complete freedom from recurrence was achieved in 81% of patients with persistent AF compared with 79% of patients with paroxysmal AF ( $p = NS$ ; Figure 1). Marked symptomatic reduction with decreased AF burden was achieved in 93% of patients with persistent AF and 92% of patients with paroxysmal AF ( $p = NS$ ).



**Conclusions:** For patients with AF, catheter ablation is a remarkable and revolutionary advance for symptom relief and alleviation of heart failure and ventricular dysfunction.

**References:**

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