Unexcitability of Ablation Line and Pulmonary Vein Isolation

Written by Toni Rizzo

Atrial fibrillation (AF) or atrial tachycardia (AT) commonly recurs after radiofrequency (RF) catheter ablation because of poor durability of pulmonary vein isolation (PVI). Daniel Steven, MD, University Heart Center, Hamburg, Germany, presented findings from a trial, based on the hypothesis that the achievement of unexcitability along the ablation line using a pace-guided approach during PVI reduces recurrences of atrial arrhythmia in patients with paroxysmal AF after PVI.

A total of 102 patients with paroxysmal AF who had failed at least 1 type I or III antiarrhythmic drug were randomly assigned to the standard technique of a circumferential mapping catheter (CMC)-guided approach (Group 1; n=50) or to a pace-guided approach (Group 2; n=52). The pace-guided approach [Soejima K et al. *Circulation* 2002] employs pacing within the scar of the ventricular myocardium with a fixed output of 10 millivolts and 2 milliseconds to identify viable myocardium within the scar. The viable myocardial cells are avoided so that they may serve as a re-entry circuit in the future. This approach was adapted for ablation of the pulmonary veins in this study.

A 3-dimensional mapping system and irrigated catheter ablation were used in both groups. Patients were monitored every 3 months with 3-day Holter monitoring and evaluation of symptoms and current medications. The procedural endpoints were entrance block that was proven by CMC in Group 1 and loss of pace-capture in Group 2. The clinical endpoint was recurrent AF or AT that lasted more than 30 seconds.

Baseline characteristics included age 62.5±10.2 years, 32% female, left atrial diameter 38±7 mm, and left ventricular function 61.2% ±6%. Successful acute isolation of all 4 veins was achieved in all patients, with no major complications in either group. The procedure duration was 138±56 minutes in Group 1 and 185±58 minutes in Group 2 (p<0.001; Table 1). Fluoroscopy time was similar in both groups.

At a mean follow-up of 14±6 months, 52% (n=26) of patients in Group 1 were free from AF or AT recurrence compared with 83% (n=43) in Group 2 (p <0.001).

Table 1. Results.

	Group 1 (CMC-Guided)	Group 2 (Pace-Guided)	p value
Patients, n	50	52	
Procedure duration (minutes)	138±56	185±58	<0.001
Fluroscopy time (minutes)	22±9	24±8	0.490
Free from AF/AT recurrence, n (%)	26 (52)	43 (83)	<0.001

AF=atrial fibrillation; AT=atrial tachycardia; CMC=circumferential mapping catheter.

Limitations of this procedure include the requirement for sinus rhythm and the need for a mapping system. Stunned tissue may not capture, and differences in success rates are related to the quality of the initial lesion set.

Prof. Steven concluded that loss of pace-capture is feasible and safe to achieve PVI. The procedure duration increases slightly, while fluoroscopy times remain unchanged. Loss of pace-capture may help to identify atrial myocardium that is responsible for later conduction recurrence. Recurrence rates are decreased when loss of pace-capture is used as an acute assessment of procedural success. Long-term outcomes remain to be determined. The use of pacing to ensure unexcitability along the PVI line has the potential to improve outcomes after PVI.

Radiofrequency Ablation versus Antiarrhythmic Drugs for AF

Written by Toni Rizzo

Recent studies suggest that pulmonary vein isolation (PVI) with radiofrequency (RF) ablation may significantly reduce the time to first recurrence and the burden of atrial fibrillation (AF) compared with antiarrhythmic drug (AAD) therapy in patients with paroxysmal AF. The primary objective of the Radiofrequency Ablation versus Antiarrhythmic Drugs for Atrial Fibrillation Treatment-2 study [RAAFT-2; NCT00392054] was to assess if catheter-based PVI isolation is superior to AADs as first-line therapy in patients with symptomatic paroxysmal recurrent AF who were not previously treated with therapeutic doses of AADs. Carlos A. Morillo, MD, McMaster University and Hamilton Health Sciences, Hamilton, Ontario, Canada, presented recent findings.

A total of 127 patients were randomly assigned to ablation (n=66) or AAD therapy (n=61) and monitored for 21