EDITORIAL COMMENT

Are We Ready for Dual-Site Right Atrial Pacing?*

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Atrial fibrillation (AF) is one of the commonest cardiac arrhythmias and is associated with a high degree of morbidity and mortality (1). To my knowledge, however, there has never been proof that suppression of AF improves survival or reduces the risk of stroke. A recent major trial involving more than 4,500 patients randomized to either rate control of “persistent” AF or rhythm control (suppression of AF) showed no significant differences in mortality, morbidity, or quality of life between the two strategies (2).

This is probably related to the fact that most patients with AF also suffer from important cardiovascular co-morbidities such as congestive heart failure, hypertension, and old age. In such patients, even if we could successfully suppress AF the long-term outcome might still be the same.

Given that conversion of AF is not likely to improve survival why would we want to suppress AF? The answer is: to control symptoms. There are many patients with paroxysmal AF who are sometimes “quite symptomatic” during their episodes of AF because of their fast ventricular rate and sometimes because of the sudden irregularity generated by the AF. Strategies to reduce “symptomatic episodes” of AF should therefore still be sought.

Neither antiarrhythmic drugs (3–5) nor atrial pacing alone (6) have been very successful in suppressing AF.

ARE WE READY FOR DUAL-SITE RIGHT ATRIAL PACING?

Dual-site right atrial pacing and bi-atrial pacing have been used as new strategies in drug refractory AF (7,8). The idea behind this novel pacing method is to reduce global atrial activation time, thereby reducing the chance of an atrial premature beat to introduce AF. This idea is interesting but does it work? In the current issue of the Journal, Saksena et al. (9) randomized 118 patients to each of three pacing methods in a cross-over, single-blind, multicenter trial. Each patient was randomized to one of the three pacing modes for six months and then crossed over to another mode. The three modes were: dual-site atrial pacing (DAP), single-site atrial pacing (SAP), and a support pacing mode (SP). The primary objectives of the study, as previously published (10), were “to compare the time to first recurrence of clinically significant symptomatic AF episodes between pacing modes, to compare the quality of life of the patients in each pacing mode and to determine if the pacing systems used are safe for this application.” There were a number of secondary objectives, but the sample size calculations were based on the following goal: “that the expected time to first recurrence doubles for these patients during SAP and triples in the dual site mode.”

From the clinical standpoint, good suppression of AF should indeed prevent recurrence of symptomatic AF episodes and improve the quality of life. In this respect the design of the study and the primary objectives stated by the investigators were clinically relevant (10). Did the study achieve its primary objectives? The time to first symptomatic recurrence of AF only “trended” to improve with DAP versus SP but not versus SAP. A post facto subgroup analysis of patients on class I or class III antiarrhythmic drugs showed a statistically significant improvement in the time to recurrence of symptomatic AF between the DAP and the SP modes but not between DAP and SAP. With respect to this primary objective, however, SAP was no better than SP irrespective of the presence or absence of antiarrhythmic drugs.

Another primary objective was the comparison of “quality of life” among the three pacing modes. Atrial fibrillation symptom scores were significantly lower in the SAP mode (p < 0.001) and tended to be lower in DAP (p = 0.09) compared to the support mode, but no differences existed between DAP and SAP. The “time to recurrence” of AF was slightly longer with dual-site atrial pacing (1.77 months) compared to SAP (0.62 month), but this difference was not statistically significant. Both of these methods, however, were statistically better than support pacing.

The investigators (9) go on to report many post facto subgroup analyses, none of which convincingly demonstrates the superiority of SAP over high right atrial pacing. The study, however, was not powered to compare directly the two overdrive methods of pacing, DAP versus SAP, nor was it powered to examine the rate of complication of the additional atrial lead placement. It is possible that, as the investigators conclude, in patients with infrequent paroxysmal AF, who are on class I or class III antiarrhythmic drugs, DAP is superior to SAP in preventing symptomatic recurrent AF (9). The statement needs to be examined, but the results of the present study are not enough to answer that question convincingly. A number of other questions are raised by this study (9). The follow-up of these patients was relatively short, 18 months on average; do we know enough about the long-term stability of the second atrial lead? What would happen after a late failure of one or more of the atrial leads? Could the additional lead represent an obstacle to a...
safe and easy repositioning, removal, or insertion of another lead (9).

Finally, are we ready to adopt DAP for overdrive suppression of AF? The study by Saskena et al. (9) does prove the technical feasibility and relative safety of DAP. Many questions, however, remain unanswered; these relate to the cost and benefit of this mode of pacing. These questions require larger long-term studies comparing the two methods of overdrive atrial pacing in specific subgroups of patients with frequent symptomatic AF.

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