Use of an Implantable Monitor to Detect Arrhythmia Recurrences and Select Patients for Early Repeat Catheter Ablation for Atrial Fibrillation  
A Pilot Study  

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Background—Catheter ablation of atrial fibrillation (AF) has proved effective in curing highly symptomatic patients with paroxysmal AF. The aim of this prospective, randomized study was to identify the optimal treatment of patients with AF recurrences after the first ablation.

Methods and Results—Two hundred eighty-six patients with paroxysmal AF underwent ablation (circumferential pulmonary vein isolation with linear lesions) and were monitored with an implantable cardiac monitor (Reveal XT, Medtronic). Patients without AF recurrences during the 3-month postablation period were assigned to group 1; those with AF recurrences to group 2. Patients in group 2 were randomly assigned to group 3 or group 4. Group 3 patients were treated only with antiarrhythmic drugs for 6 weeks, with no early reablation during the 3-month postablation period. In the case of AF recurrence after the 3-month postablation period, patients underwent reablation. Group 4 patients were treated according to the onset mechanism of AF recurrences, as detected and stored by the implantable cardiac monitor: antiarrhythmic drug therapy, but no reablation if AF was not preceded by triggers; early reablation if premature atrial beats or atrial tachycardias or flutter triggered AF. All patients were followed up for 1 year to assess maintenance of sinus rhythm in each group. On 12-month follow-up examination, of the 119 (42%) patients in group 1, 112 (94%) had no AF recurrences. Among the 83 patients in group 3, only 27 (33%) had no recurrences. Of the 84 group 4 patients, 67 (80%) had no AF recurrences ($P<0.0001$ versus group 3).

Conclusions—Patients with recurrences after the first AF ablation are likely to respond to a second early ablation when AF is triggered by supraventricular arrhythmias or premature contractions.

Clinical Trial Registration—URL: http://www.clinicaltrials.gov. Unique identifier: NCT01164319.

(Circ Arrhythm Electrophysiol. 2011;4:823-831.)  

Key Words: atrial fibrillation ■ ablation ■ continuous subcutaneous monitoring
A major source of difficulty is the complexity of defining the success of the procedure itself. Because AF occurrence may be paroxysmal and/or asymptomatic and symptoms may be misleading, freedom from AF is difficult to document. The typical methods of monitoring recurrences is ECG, periodic 24-hour Holter monitoring and event monitoring (30 seconds to 3 minutes per day), and the use of symptoms to document rhythm. Given the difficulty of defining symptoms, the fact that episodes may be nocturnal and the limitations of intermittent monitoring, AF recurrence may be underestimated and patients with/without recurrences may be misclassified.

New subcutaneous implantable cardiac monitors (ICM) are now available that are equipped with a dedicated AF detection algorithm that has proved to be highly sensitive in detecting the presence of AF (96%). In addition, the ICM accurately measures AF burden (98%).

The aim of this prospective, randomized study was to identify the most appropriate strategy for treating patients with AF recurrences after the first ablation, through the diagnostic data stored by a subcutaneous AF monitor (ClinicalTrials.gov, NCT01164319).

**Methods**

The study protocol was approved by the local ethics committee and conducted in compliance with the protocol, in accordance with standard operating procedures and the Declaration of Helsinki. All patients enrolled in the study provided written informed consent.

**Patient Population**

Highly symptomatic, drug-refractory patients with paroxysmal AF were enrolled in this prospective, randomized study.

Inclusion criteria included (1) highly symptomatic patients refractory to at least 2 AADs (class I and class III) and (2) patients with sustained and ECG-documented AF episodes (>30 minutes).

Exclusion criteria included (1) congestive heart failure, (2) ejection fraction <35%, (3) left atrial diameter >60 mm, and (4) previous AF ablation procedure.

**Ablation Procedure**

The left atrium (LA) and pulmonary veins (PVs) were explored through a transseptal approach. Real-time 3D LA maps were reconstructed by using a nonfluoroscopic navigation system (CARTO, Biosense-Webster Inc). The ipsilateral left and right PVs were encircled in 1 lesion line by circumferential PV isolation (PVI). Radiofrequency energy was delivered at 43°C, 35 W, 0.5 cm away from the PV ostia at the anterior wall, and was reduced to 43°C, 30 W, 1 cm away from the PV ostia at the posterior wall, with a saline irrigation speed of 17 mL/min. Each lesion was ablated continuously until the local potential amplitude decreased by >80% or radiofrequency energy deliveries exceeded 40 seconds. The end point of circumferential PVI was PVI; this was confirmed when Lasso catheter (Biosense-Webster Inc) mapping showed the disappearance of all PV potentials or the dissociation of PV potentials from LA activity. All patients were treated with PVI and lines. Additional ablation lines were created by connecting the left inferior PV to the mitral annulus (mitral isthmus) and the roof of the LA between the 2 superior PVs. The cavo-tricuspid isthmus was ablated in those with a history of atrial flutter. Bidirectional conduction block across the lines was assessed by pacing.

**The Implanted AF Monitor**

The ICM (Reveal XT, Medtronic Inc) was implanted either on the day of the ablation procedure or 1 week before. Reveal XT continuously classifies the heart rhythm of the patient by analyzing the beat-to-beat variability of cardiac cycles on a 2-minute ECG strip. The device records the amount of AF per day (Daily Burden, hours in AF in 1 day) and the AF burden of the follow-up period, defined as the percentage of time in AF (AF%). The trend in daily AF burden and all AF-related parameters are shown by the programmer on follow-up examination through the Cardiac Compass, a specific software that summarizes the data stored during the follow-up period. As an example, Figure 1 shows the trend in daily AF burden in 2 patients, 1 with no further AF after ablation and 1 with AF recurrences.

In addition, Reveal XT stores the ECG of the detected episodes for final classification and validation through visual inspection by the investigator and the trend of >500 ventricular beats preceding the detection marker of the most recent AF episode.

The Reveal XT was implanted in the parasternal area of the chest. The technical requirement for defining the exact final position was an R-wave amplitude ≥0.4 mV assessed through the Vector Check.

**Study Design**

Figure 2 shows the study design and the patient flow in detail. Each patient enrolled underwent PVI+linear lesions and Reveal XT implantation. Patients in whom no AF recurrences were detected by the ICM during the 3-month postablation period were assigned to
group 1 (no early AF recurrences); those with ICM-documented AF were assigned to group 2 (early AF recurrences). Patients in group 1 were monitored for 12 months to assess the 1-year success rate of ablation in this subpopulation.

Group 2 patients were randomly assigned during the 3-month postablation period to group 3 or group 4. All patients in groups 3 and 4, after random assignment during the 3-month postablation period, underwent typing of early recurrences of AF, for example, detection of the triggers of AF, as stored by the implanted monitor. For this purpose, we analyzed the heart rate trend of at least 10 beats before the AF onset and the stored ECGs (Figure 3).

Patients in group 3 were treated only with AAD for 6 weeks, with no early reablation during the 3-month postablation period; they were followed up for 1 year after enrollment to monitor recurrences. In the case of AF recurrence after the 3-month postablation period (late recurrence), patients underwent reablation (late reablation) or AAD therapy.

Patients in group 4, after random assignment and ER typing, were treated in accordance with the onset mechanism of AF recurrences stored during the 3-month postablation period. There were 3 possibilities of treatment in this group of patients:

1. No reablation if AF started suddenly and was not preceded by premature beats or supraventricular tachycardias. AAD allowed.
2. Early reablation if AF onset was triggered by atrial tachycardia (AT) or atrial flutter (ablation of the supraventricular arrhythmias).
3. Early reablation if premature atrial beats triggered AF onset (PVI and ablation of triggering activity removed from PVs).

All patients were followed up for 1 year after enrollment to assess maintenance of sinus rhythm. In the case of late recurrences (from 3–12 months), the data stored by the devices were used to tailor the AAD therapy and/or to guide an additional ablation procedure.

The primary end point is AF-free survival (AF burden $<0.5\%$); the primary analysis is the comparison of group 4 versus group 3 (randomly assigned patients) from 3 months after ablation to end of follow-up. Secondary analysis was AF recurrence in group 3 versus group 1; group 4 versus group 1; and between subgroups (sudden AF onset and triggered AF onset) of group 3 and group 4.

Follow-Up

After sheath removal, all patients were treated with intravenous heparin until the next morning. Treatment with warfarin started the night of the procedure. One day after ablation, low-molecular-weight heparin was used at a dose of 0.5 mg/kg subcutaneously every 12 hours until the international normalized ratio was $>2.0$. Oral anticoagulation was discontinued 6 months after ablation in patients with a CHADS2 score $<2$ if they were responders. Patients in group 3 and group 4 without early reablation were treated with AAD (Propafenone, Flecainide, Sotalol) for 6 weeks.

The data stored by the device were collected every month during the 12-month follow-up period. Data on the trend in daily AF burden were collected during each follow-up examination, together with the ECG stored by the device, to identify responders and nonresponders.

Definition of Responders, Nonresponders, and AF Recurrence

Patients with symptomatic AF recurrences, AT, or atrial flutter (confirmed by the ECG stored through the implanted monitor) during the 3-month postablation period were assigned to group 2 and randomly assigned. Patients without symptoms imputable to any supraventricular arrhythmia and with an AF% $<0.5\%$ at each monthly follow-up examination were considered responders.$^{21}$ On the contrary, patients with symptoms concomitant to genuine AF, AT, or atrial flutter in the ECG stored by the implanted monitor and patients without symptoms but with an AF% $>0.5\%$ in at least 1 of the monthly examination of the follow-up period were considered nonresponders, that is, patients with AF recurrence.

The cutoff of 0.5% corresponds to a maximum cumulative time in AF of 3.6 hours in 1 month. This definition of responders was used by our group in a previous study.$^{22}$ We decided this cutoff from the results of the TRENDS study,$^{22}$ the first that defined the minimum amount of AF that doubles the thromboembolic risk compared with

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Figure 2. Study design and patient flow. PVI indicates pulmonary vein isolation; ER, early recurrence; and AF, atrial fibrillation.
patients without AF or with a lower burden. This was 5.5 hours on 1 day. A similar approach was also used by Botto et al.; they discriminated between long-lasting episodes (>24 hours) and any AF episode, defined as episodes providing a burden >5 minutes in 1 day. We chose 0.5% in 1 month to be much more restrictive because it corresponds to 3.6 hours of arrhythmia in 1 month. We decided to combine the absence of symptoms triggered by any concomitant supraventricular arrhythmia documented by the ICM, with the monthly AF% <0.5%, to be very selective in the definition of responders.

Statistical Analysis
The sample size calculation was driven by the primary end point: group 3 versus group 4. A study sample of 82 patients in each group (groups 3 and 4) was estimated to detect a 30% difference in the clinical outcome; the expected event rates in each randomized group were 45% and 75%, respectively (assuming that approximately 40% of patients may not show a treatment difference because they are sudden AF onset patients), with a statistical power of 0.80 and a 2-tailed $\alpha$ of 0.05. The clinical and statistical hypotheses came from our prior experience on ablation and continuous monitoring.

Results are expressed as mean±SD or as numbers and percentages, as appropriate. Continuous variables were compared by 1-way ANOVA. The Mann-Whitney $U$ test was used if normal distribution criteria were not met. $\chi^2$ analysis for categorical variables was used for comparisons between characteristics of patients (Table). Kaplan-Meier analysis was performed to determine the probability of success, estimated as the percentage of responders. Differences in the

Figure 3. Examples of onset mechanisms: A, sudden onset of atrial fibrillation (AF) (from sinus rhythm to AF), without a specific trigger; B, AF triggered by atrial flutter (AFl); and C, AF triggered by premature atrial contractions.
arhythmia-free survival were assessed by the log-rank test. For the success rate, all patients with a recurrence from 3 to 12 months were considered to have failed. For the freedom from ablation, patients who have a recurrence and undergo repeat ablation from 3 to 12 months were considered to have failed. All reported probability values were based on 2-sided tests, and a probability value of <0.05 was considered significant. All statistical calculations were performed using the SPSS version 13.0 software (SPSS Inc, Chicago, IL).

The authors had full access to and take responsibility for the integrity of the data. All authors have read and agree to the manuscript as written.

Results

From November 2007 to September 2009, 294 consecutive patients with paroxysmal AF were enrolled in our study. Three patients in the group without ER and 5 patients in the group with ER were excluded owing to insufficient follow-up. The remaining 286 patients were included in the analysis.

Complete disconnection of the PVs from the LA and conduction block along the roof was successfully achieved in all patients (100%), with a mean atrial electrogram interval of 141±19 ms. Complete mitral isthmus block was obtained in 259 of 286 (91%), with a mean atrial electrogram interval of 163±38 ms; in the remaining 27 (9%) patients, acute conduction slowing along the mitral isthmus during coronary sinus pacing was observed. Cavo-tricuspid isthmus ablation was successful in all 79 patients with a history of atrial flutter. Average duration of the procedure was 132±28 minutes and average fluoroscopy time was 21±16 minutes. No procedure-related complications occurred with regard to either ablation or the monitoring device. The data stored by the device were analyzed by the investigators. The Table shows the baseline characteristics of each group of patients. Patients with ER (group 2) had a significantly longer duration of AF history (4.7±3.9 years versus 6.1±4.9 years, P=0.01) than patients without ER (group 1). In all baseline characteristics, there were no statistically significant differences between subgroups of group 3 and group 4.

Incidence of Early AF Recurrences Within the 3-Month Postablation Period

Within the 3-month postablation period, all 172 of the 294 patients (58%) with ER were randomly assigned (group 3, 83 patients, 50%; group 4, 84 patients, 50%; 5 patients were excluded) and divided into 2 subgroups according to the onset mechanism of the ER (Figure 2). Sudden-onset AF was identified in 33 patients (39%) of group 3 and in 30 patients (36%) of group 4; these were treated with AAD for 6 weeks without early reablation. Triggered-onset AF was identified in 50 patients (61%) of group 3; they were treated with AAD for 6 weeks without early reablation. The remaining 54 patients (64%) with triggered-onset AF of group 4 were reablated: the procedure consisted of reisolation of PV if premature beats triggered AF, or ablation of AT or atrial flutter when these arrhythmias preceded AF. In this group of patients, the mean time to early reablation and to the first AF recurrence after the first procedure was 21±5 days and 16±4 days, respectively. At least 1 PV had become reconnected in 43 patients (80%), the cavo-tricuspid isthmus had recovered in 6 (11%), the mitral isthmus had recovered in 9 (17%), and the roof line had recovered in 2 (4%). Average duration of the early reablation procedure and fluoroscopy time was 98±16 minutes and 13±9 minutes, respectively.

Incidence of Late AF Recurrences After the 3-Month Postablation Period

At the end of the 12-month follow-up, 112 (94%) of the 119 patients without ER (group 1) were responders (Figure 4). Among the 83 patients of group 3, only 27 (33%) were responders (P<0.0001 versus group 1). In group 4, 67 (80%) of the 84 patients were responders (P=0.001 versus group 1; P<0.0001 versus group 3).

In group 3, 23 (69%) of the 33 patients with sudden-onset AF were responders; among the 50 patients with triggered AF, 4 (8%) were responders (P<0.0001 versus sudden-onset AF; Figure 5).

In group 4, 19 (63%) of the 30 patients with sudden-onset AF were responders (P=0.38 versus sudden-onset AF group 3); among the 54 patients with triggered AF, 48 (89%) were responders (P=0.003 versus sudden-onset AF; P<0.0001 versus trigger-onset AF group 3).

Additional Ablation Procedures After the 3-Month Postablation Period (Late Reablation)

Of the 119 patients without ER (group 1) only 4 (3%) required a subsequent ablation procedure (second procedure; Figure 6). The average time to second ablation was 267±36 days. In group 3, 51 (61%) patients required an additional ablation procedure (second procedure) (P<0.001 versus group 1). The average time to second ablation was 158±21 days. In group 4, the 54 patients with triggered AF onset had

Table. Baseline Characteristics of the Patient Population

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (n=119)</th>
<th>Group 2 (n=167)</th>
<th>P</th>
<th>Group 3 (n=83)</th>
<th>Group 4 (n=84)</th>
<th>P</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>56±8</td>
<td>56±10</td>
<td>0.9</td>
<td>55±9</td>
<td>56±10</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Sex, M/F, n</td>
<td>98/21</td>
<td>132/35</td>
<td>0.4</td>
<td>67/16</td>
<td>65/19</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>21 (17)</td>
<td>32 (19)</td>
<td>0.3</td>
<td>17 (20)</td>
<td>15 (17)</td>
<td>0.4</td>
<td>0.1</td>
</tr>
<tr>
<td>Diabetes mellitus, n (%)</td>
<td>7 (6)</td>
<td>14 (8)</td>
<td>0.2</td>
<td>8 (9)</td>
<td>6 (7)</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>LVEF, %</td>
<td>61±6</td>
<td>58±5</td>
<td>0.1</td>
<td>58±5</td>
<td>59±6</td>
<td>0.8</td>
<td>0.1</td>
</tr>
<tr>
<td>LAD, mm</td>
<td>45±7</td>
<td>46±5</td>
<td>0.6</td>
<td>45±5</td>
<td>46±6</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>AF history, y</td>
<td>4.7±3.9</td>
<td>6.1±4.9</td>
<td>0.01</td>
<td>5.9±4.2</td>
<td>6.2±4.8</td>
<td>0.6</td>
<td>0.02</td>
</tr>
</tbody>
</table>

LVEF indicates left ventricular ejection fraction; LAD, left atrial diameter; and AF, atrial fibrillation.
early reablation by design; 9 (11%) patients had late reablation, and they were all from the sudden AF onset group that did not receive early reablation. The average time to late reablation was 209±29 days (P=0.001 versus group 1; P<0.0001 versus group 3).

A late reablation (second procedure) was performed in 64 patients. In 43 (67%) patients, the second ablation was performed to eliminate only AF; in 17 (27%) patients, it was performed to eliminate AF and atypical atrial flutter; and in 4 (6%) patients, it was performed to eliminate atypical atrial flutter only. In 17 patients with atypical atrial flutter, the arrhythmia developed as a result of the gap in the lesion line of the left isthmus and in 4 patients in the roof line. At least 1 PV was reconnected in 59 (92%) patients, and cavo-tricuspid isthmus recovered in 8 (12%) patients. Average duration of the procedure and fluoroscopy time was 113±21 minutes and 16±8 minutes, respectively.

The group 1 patients with late reablation (second procedure) did not require any further procedure because they were responders. Similarly, 36 (71%) of the 51 patients (group 3) who had a late second ablation did not require any further procedure because they were responders.

In group 4, 57 (90%) of the 63 patients who had early or late second ablation did not require any further procedure (P=0.009 versus group 3, log-rank test) because they were responders.

Finally, at the end of the 12-month follow-up after 1 or more ablation procedures, 116 (97%) of the 119 patients of group 1 were responders (Figure 7). Among the 83 patients of group 3, only 63 (76%) were responders (P<0.0001 versus group 1). In group 4, 78 (92%) of the 84 patients were responders (P=0.027 versus group 1; P<0.009 versus group 3). Figure 7 shows the percentage of responders from the day of the last procedure to 12 months later.

Ablation Procedures During the Overall Follow-Up Period

The total number of ablation procedures needed in group 4 and group 3 was not significantly different (1.82±0.5 versus 1.79±0.7, median [Q1:Q3] were 2.5 [1:3] versus 2.0 [1:2]; P=0.28).

Discussion

The main finding of our study is that in patients with AF recurrences after the first ablation, a strategy of deciding the

Figure 4. Incidence of late atrial fibrillation (AF) recurrences in patients with (group 3, group 4) and without (group 1) early recurrences. AT indicates atrial tachycardia.

Figure 5. Incidence of late recurrences in patients with sudden-onset atrial fibrillation (AF) group 3 and group 4; trigger-onset AF group 3 and group 4. AT indicates atrial tachycardia.
subsequent optimal therapy on the basis of the diagnostic data provided by continuous AF monitoring increases the probability of maintaining sinus rhythm.

Performing an early second ablation within the 3-month postablation period was a successful approach in 89% of our patients whose recurrences were triggered by premature atrial contractions or AT or atrial flutter. Moreover, in patients with early AF recurrences, but without a specific trigger, AAD therapy can be a valid choice and can maintain sinus rhythm over 1-year follow-up in about 63% of patients.

Lellouche et al\textsuperscript{10} showed that a strategy of early reablation reduces the incidence of further recurrences but significantly increases the number of ablations per patient. According to our results, after the typing of AF recurrences and early reablation of triggered-onset AF, the success rate of further ablation increases, whereas the total number of ablations per patient is approximately the same as in traditional management of AF recurrences.

The success rate of the first procedure was considerably lower than that shown by other recent studies. Such discrepancy can be explained by a more accurate monitoring strategy, based on continuous monitoring for detecting asymptomatic episodes as well. In our study, we defined responders as those patients with a very low AF burden during the monthly follow-ups. In the large majority of trials on AF ablation, the monitoring strategy was based on 24–72 hours of Holter monitoring. This also explains why the number of early AF recurrences (during the first month) was higher than that in previous studies. Thus far, few studies, on relatively small cohorts, have used continuous monitoring to evaluate the impact of PVI on AF recurrences.\textsuperscript{17,19–21,24} An important variable in the assessment of the efficacy of arrhythmia treatment is the choice of monitoring tools. For this reason, we decided to use a validated\textsuperscript{19} device to continuously monitor each patient from the first ablation procedure onward.

Our study is the first to address the clinical issue of the optimal strategy for deciding whether to perform a second ablation or to implement drug therapy in patients with recurrences after their first PVI who are continuously monitored through an implantable device. It is well known that PVI is performed to prevent the triggering activity of premature contractions. Detecting the onset of AF recurrences can therefore provide crucial information to guide the decision as to the optimal action to take.\textsuperscript{25} In addition, the detection of AT or atrial flutter that trigger AF also yields valuable information to drive a specific second ablation. Selecting the right patients for a second procedure and planning the

![Figure 6. Additional ablation procedures in groups 1, 3, and 4.](image1)

Log-rank test: $P=0.001$ Group 4 vs. Group 1; $P=0.0001$ Group 3 vs. Group 1; $P=0.0001$ Group 3 vs. Group 4

![Figure 7. Incidence of atrial fibrillation (AF) recurrences in patients after last ablation (second procedure). AT indicates atrial tachycardia.](image2)

Log-rank test: $P=0.027$ Group 4 vs. Group 1; $P=0.0001$ Group 3 vs. Group 1; $P=0.009$ Group 4 vs. Group 3

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**Pokushalov et al** Early Repeat Ablation for Atrial Fibrillation 829

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specific procedure are the keys to increasing the success rate of ablation, when the target is sinus rhythm.

In our overall population, the success of the first PVI procedure was 42% at the end of the 3-month postablation period. The second procedure, which was guided by the data provided by continuous monitoring, reached a success rate of 89% in patients with a specific onset trigger. In those patients who did not undergo a second ablation because no AF trigger was found in the stored episodes after the first PVI, AADs yielded a success rate of 63% on 12-month follow-up. Early reablation minimizes the time spent in AF, so it could limit the remodeling of the atria and the progression to persistent or permanent AF. This is a possible explanation why early reablation might be superior to other strategies and could increase the success rate, especially if guided by the onset mechanism.

Catheter ablation is indicated in highly symptomatic patients in whom AAD therapy has failed to prevent symptomatic events.*26–27 However, drug therapy may be attempted in nonresponders to the first ablation of PVI when the atrial substrate may be responsible for recurrences.

The clinical implication of our findings is that accurate AF monitoring can lead to a higher probability of maintaining sinus rhythm in patients with PAF who undergo ablation, when sinus rhythm is the target independently of symptoms.

Limitations

The present study was aimed at optimizing patient selection for the best therapeutic approach after a first unsuccessful AF ablation. We treated the patients with PVI and linear lesions; therefore we could not assess the impact of each single procedure on the success rate.

The number of patients in the randomized arms was limited, and differences in outcome between nonrandomized arms may be due to not only monitoring of the onset mechanism of AF recurrence but also due to early reablation independent of monitoring. In this study, we did not use the usual definition for failures (>30 seconds of AF): it is possible that we might get a different result. On the other hand, intermittent office ECG analysis or Holter recordings are much less accurate than continuous monitoring.12–22

Finally, we did not decide on treatment with AADs a priori; this was decided on a clinical basis for each patient during follow-up examinations.

Conclusions

Patients with recurrences of AF after the first ablation procedure are likely to respond to a second procedure when AF is triggered by premature contractions or other supraventricular arrhythmias.

Disclosures

Dr Corbucci is an employee of Medtronic.

References


* JACC, American College of Cardiology Foundation; ESC, European Society of Cardiology; BOA, Belgian Arrhythmia Group; HRS, Heart Rhythm Society; AHA, American Heart Association; STS, Society of Thoracic Surgeons; ACC, American College of Cardiology; AHA, American Heart Association; ESC, European Society of Cardiology; BOA, Belgian Arrhythmia Group; HRS, Heart Rhythm Society; AHA, American Heart Association; STS, Society of Thoracic Surgeons.
CLINICAL PERSPECTIVE

After catheter ablation for atrial fibrillation, early recurrences do not preclude long-term success, but some patients will need a second procedure. In the present study, all patients received an implantable atrial fibrillation monitor to characterize recurrences. Patients with arrhythmia recurrences with early recurrences were randomly assigned to medical therapy or catheter ablation. The findings suggest that patients with early recurrences were more likely to benefit from early repeat ablation. Early recurrences that are atrial tachycardia or atrial flutter may resolve with medical therapy, such that waiting is a reasonable strategy. These findings suggest that continuous monitoring for atrial arrhythmia can be helpful in guiding the management of recurrent arrhythmias and the timing of repeat ablation.
Use of an Implantable Monitor to Detect Arrhythmia Recurrences and Select Patients for Early Repeat Catheter Ablation for Atrial Fibrillation: A Pilot Study
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Circ Arrhythm Electrophysiol. 2011;4:823-831; originally published online September 19, 2011; doi: 10.1161/CIRCEP.111.964809

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