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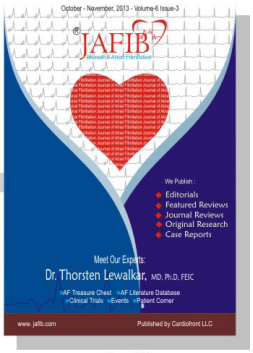

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Exploring the Potential Role of Catheter Ablation in Patients with Asymptomatic Atrial Fibrillation Should We Move away from Symptom Relief?

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Abstract

Although silent atrial fibrillation (AF) accounts for a significant proportion of patients with AF, asymptomatic patients have been excluded from AF ablation trials. This population presents unique challenges to disease management. Recent evidence suggests that patients with asymptomatic AF may have a different risk profile and even worse long-term outcomes compared to patients with symptomatic AF. For the same reasons they might be more prone to side-effects of antiarrhythmic drugs, including pro-arrhythmias.

The poor correlation between symptoms and AF demonstrated in several studies should caution physicians against making clinical decisions depending on symptoms. Although current guidelines recommend AF ablation only in patients with symptoms, more attention should be paid to the AF burden and a rhythm control strategy has the potential to improve morbidity and mortality in AF patients. However, limited data exist regarding the use of catheter ablation for asymptomatic AF patients.

As ablation techniques have improved, AF ablation has become more widespread and complication rate decreased. As a result, referrals of asymptomatic patients for catheter ablation of AF are on the rise. In this review we discuss the many unresolved questions concerning the role of the ablative approach in asymptomatic patients with AF.

Introduction

Atrial fibrillation (AF) is the most common cardiac rhythm disturbance seen in clinical practice[1] and it is associated with an increased long-term risk of stroke, heart failure and all cause mortality.[2-4] Appropriate management of AF-patients has been engaging clinicians for many years; although there are clear guidelines for the acute management of symptomatic AF,[5]the best long-term approach for patients with a first or recurrent AF is still debated with regard to quality of life, risk of rehospitalization, and possible disabling complications such as thromboembolic stroke, major bleeding and death.

The mainstay of treatment for AF has traditionally been pharmacological; however, the limited efficacy and proarrhythmic risks of anti-arrhythmic drugs (AAD) have led to the development of non-pharmacologic therapeutic approaches.[6] Two arrhythmia strategies for AF treatment are currently offered to patients: rate control and rhythm control. A few randomized trials comparing outcomes of rhythm vs rate-control strategies have been published. In particular, the AFFIRM, RACE and AF-CHF trials[7-9] demonstrated no differences in terms of morbidity and mortality when comparing rate versus rhythm control strategies in patients with AF. However, when data from these trials are analyzed according to patient's actual rhythm, the benefit of sinus rhythm over AF becomes apparent, reflecting the ineffectiveness of the rhythm control methods used.[10] The introduction of new rhythm-control strategies with higher efficacy and less adverse effects might produce superior long-term results to either rate control or rhythm control using antiarrhythmic drugs.

A number of controlled, randomized clinical trials have consistently

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shown that catheter ablation is superior to antiarrhythmic pharmacological treatment in maintaining sinus rhythm among patients with drug-refractory AF.[11-17] In particular, most of the published trials have reported a considerable success rate in patients with paroxysmal AF and without marked underlying cardiac disease with a relatively safe risk profile.[18-21] Currently, patients selected for AF catheter ablation represent a highly symptomatic subgroup within the total AF population and guidelines recommend catheter ablation in those patients with a goal of improving patient's quality of life. However, AF is often asymptomatic and only discovered by chance or when stroke has already occurred. Hence, there is a need to improve outcomes in patients with silent AF. Beyond oral anticoagulation (OAC), a rhythm control strategy is potentially beneficial to these patients.

Symptoms and Quality of life in AF Patients: Some Answers but Even More Questions.

Although AF is responsible for a variety of symptoms, it is estimated that one third of patients with AF report no overt symptoms and are unaware of their arrhythmic condition: a condition referred to as silent or asymptomatic AF. The prevalence of asymptomatic AF varies considerably among the different studies, depending on the enrolled population or the methods in which the rhythm is documented [Table 1]. Studies with transtelephonic or implantable monitoring devices have reported asymptomatic AF in up to 50% of evaluated patients,[42,43] even in the most symptomatic ones.[43,44] As AF ablation has become more widespread, there is a number of reasons to consider this non-pharmacological approach in the overall management of patients with silent AF.

AF-Related Symptoms: Relying on the Untrustable

Symptoms are a major reason for which patients with AF seek medical attention but there are many unresolved questions concerning the relation between symptoms and AF. As known, there is a weak association between symptoms and the actual rhythm; AF can present in a variety of clinical scenarios, symptoms are often very subjective and may not be specific for AF because other cardiovascular conditions and risk factors for AF may cause similar symptoms and predispose the patient to the AF itself. Furthermore, given the age-related prevalence of both AF and cardiovascular disorders (greater in older patients), it is inherently difficult to evaluate AF-related symptoms in a vast proportion of AF patients.

There is currently no reliable method to precisely identify AF-related symptoms and no standardized assessment of symptoms or functional status has been accepted as the gold standard in AF patients. Regardless of their level of symptoms, patients, are not consistently able to accurately report the presence or absence of AF episodes[45] and the relationship between symptoms and the onset of the arrhythmia is not always obvious. Thus, the simple awareness of symptoms is not a good discriminator of the presence or absence of this arrhythmia. All symptoms without a clearly determined non-AF cause should be classified as AF-related symptoms but symptoms are difficult to measure objectively and many AF patients have some vague nonspecific discomfort such as dizziness or fatigue. An important way to overcome this limitation is to analyze symptoms according to rhythm status: AF-related symptoms should be closely related to the underlying rhythm, disappearing after restoration of sinus rhythm. This is easier to note for palpitations compared to

Table 1: Published studies reporting the prevalence of asymptomatic atrial fibrillation

Study (Reference)	Population	Follow-up (months)	Silent AF (%)
Defaye et al. 1996 (22)	617 with DDD PMK	1	• 58% • 21% (newly developed AF)
Kerr et al. 1996 (23)	674 with AF	12	21%
Lévy et al. 1999 (24)	756 with AF	12	11.4%
Page et al. 2003 (25)	1380 in sinus rhythm with a history of AF/AFlutter receiving placebo or azimilide	9	• Placebo group: 18% • Azimilide group: 13%
Flaker et al. 2005 (26)	4060 randomized to either rhythm or rate control	60	12% at baseline
Hindricks et al. 2005 (27)	114 with highly-symptomatic drug-refractory AF undergoing PVI	12	• Before ablation: 5% • After ablation: → Immediately: 22% → 3-mo: 38% → 6-mo: 37% → 12-mo: 36%
Neumann et al. 2006 (28)	80 with paroxysmal AF undergoing PVI	12	• Symptomatic: 36.3% • Asymptomatic: 13.7% • Mixed: 7.5%
Wasamreddy et al. 2006 (29)	19 with highly-symptomatic drug-refractory AF undergoing catheter ablation	6	82.4% of AF episodes
Janse et al. 2007 (30)	41 undergoing PVI	5	• Before ablation: 35% of AF episodes • After ablation: 65% of AF episodes
Pontoppidan et al. 2009 (31)	149 with paroxysmal/ persistent AF undergoing PVI	12	• Symptomatic: 14.6% • Asymptomatic: 15.5% • Mixed: 2.9%
Hickey et al. 2010 (32)	54 with a history of systolic heart failure and/or hypertension	0,5	2%
Cabrera et al. 2011 (33)	585 undergoing PMK implantation	66	27% of patients with new episodes of AF detected by 12-lead ECG or by device interrogation
Healey et al. 2012 (34)	2580 patients ≥ 65 years with ICD or PMK	3	10.1%
Winkle et al. 2012 (35)	203 patients off anti-arrhythmic drugs, clinically free of AF after catheter ablation	12	• 4.3% on 7-day Holter monitoring • 23.5% on PMK interrogation
Sobocinski et al. 2012 (36)	249 who had suffered an ischemic stroke/transient ischemic attack	1	6.8% of patients diagnosed with AF → Symptomatic episodes: 22% → Asymptomatic episodes: 78%
Samol et al. 2013 (37)	132 with cardiovascular risk factors	-	5.3%
Potpara et al. 2013 (38)	1100 with first diagnosed AF	120	13.3%
Engdahl et al. 2013 (39)	848 75-year old patients	-	• 1.2% on 12-lead ECG recording • 7.4% on hand-held ECG event recording
Verma et al. 2013 (40)	50 with symptomatic AF undergoing PVI	21	56% of AF episodes
Tondo et al. 2013 (41)	143 implanted with a continuous cardiac monitor following PVI	14	46%

AF= atrial fibrillation; PMK= pacemaker; PVI= pulmonary vein isolation; ICD= implantable cardioverter defibrillator.

other symptoms (eg. exertional dyspnea); however, the intensity of palpitations during AF recurrences might gradually decrease until becoming subclinical.

The lack of a reliable instrument to assess AF-related symptoms prompted an expert consensus panel to propose an AF classification to compare symptoms across trials and in clinical practice.[46] Due to the above mentioned limitations, symptoms are recommended as secondary outcome parameters in AF trials and the EHRA classification of AF symptoms does not clearly distinguish between symptoms caused by AF or the underlying heart disease.[45] Of note, the end point "elimination of any atrial arrhythmia irrespective of symptoms" has been recommended by the Heart Rhythm Society/ European Heart Rhythm Association/European Cardiac Arrhythmia Society Consensus Document for standardized reporting of clinical trial outcomes.[47] Despite such limitations, the presence of symptoms still represent an important issue in the management of AF patients and few minimally symptomatic or asymptomatic patients are referred for ablative therapy. The poor correlation between symptoms and AF demonstrated in several studies should caution physicians against making clinical decisions depending on symptoms.

Table 2: Published studies evaluating the risk of stroke in AF patients with or without symptoms.

asymptomatic AF			**Risk of stroke in**
Glotzer et al. 2003 (61)	312 with PMK that monitor AHRE	27	• 51.3% of cases with AHRE • hazard ratio AHRE vs. non-AHRE for death or non-fatal risk of stroke: 2.79
Glotzer et al. 2009 (62)	2486 with ≥ stroke risk factors receiving PMK or ICD that monitor AT/AF burden*	16	Annualized risk: • Group zero: 1.1% • Group low: 1.1% • Group high: 2.4%
Healey et al. 2012 (34)	2580 ≥65 years undergoing PMK or ICD implantation	29	Attributable risk of stroke or systemic embolism associated with subclinical AF: 13%
asymptomatic vs. symptomatic AF			**Risk of stroke in**
Flaker et al. 2005 (26)	4060 randomized to either rhythm or rate control	60	• Stroke: p=0.43 • Combined end-point (death, disabling stroke or anoxic encephalopathy, major central nervous system haemorrhage, cardiac arrest): p=0.34
Cullinane et al. 1998 (63)	111 undergoing transcranial Doppler recordings (1h) for asymptomatic embolic signals detection	-	Embolic signals during recordings: p=0.84
Potpara et al. 2013 (38)	1100	120	Higher risk in asymptomatic: p=0.013
patients with stroke			**Incidence of AF among**
Wolf et al. 1983 (64)	5184 (Framingham study)	360	• 501 cases of stroke • 59 cases of stroke in the presence of AF
Wolf et al. 1991 (65)	5070 (Framingham study)	408	• 572 cases of strokes • 114 cases of embolic stokes • 311 newly diagnosed AF
Lin et al. 1995 (66)	5070 (Framingham study)	456	• 656 cases of stroke • 115 cases of strokes in the presence of AF • 89 cases of stroke with previously documented episodes of AF • 21 cases had AF discovered for the first time on admission for the stroke • 5 cases developed AF after admission
Sobocinski et al. 2012 (36)	249 stroke patients	1	17 (6.8%) newly diagnosed cases of silent AF

AF= atrial fibrillation; AHRE = atrial high rate events; AT = atrial tachycardia; PMK= pacemaker; ICD= implantable cardioverter defibrillator.
* AT/AF burden: the longest total AT/AF duration on any given day during the prior 30-day period (group zero: noAT/AFevents; group low: <5.5 hours; group high: >5.5 hours)

Revisiting Quality of Life in AF Patients: Even in Asymptomatic Ones.

Patients with AF have a considerably impaired quality of life (QoL) that is independent on the severity of the disease. Restoration and maintenance of sinus rhythm is associated with a significant increase in QoL.[48-50] Rather surprisingly, several aspects of QoL may be reduced in AF patients even in the absence of overt AF-related symptoms.[42,51] Although this condition might be related in part to the knowledge that they have a cardiac illness, patients remaining in AF often continue to experience poor exercise tolerance which is difficult to recognize as an AF-related symptom. Furthermore, a reduced QoL in patient with silent AF may also be related to the use of drugs after AF is discovered. The negative effect on QoL with AADs or with OAC therapy is no surprising; in fact, many patients request an ablation procedure merely to "get off drugs". Moreover, it is very likely that in many cases the so called "asymptomatic" patients have vague nonspecific symptoms such as dizziness or fatigue not clearly attributable to AF.

Although the improvement in QoL on restoration and maintenance of SR is more evident in highly symptomatic AF patients,[52] several aspect of overall lifestyle might be improved even in the absence of symptoms of the arrhythmia. Therefore, even asymptomatic patients with AF have the potential to show significant benefits in both non-specific symptoms and overall lifestyle with a rhythm control strategy, also in case of a failed ablation procedure.[53]

Management of AF Patients: Beyond Symptoms Improvement.

The results of the RACE and AFFIRM trials can not be easily compared to all asymptomatic patients with AF. These studies enrolled predominantly older patients (> 70 years), most of whom had persistent AF and heart disease, and follow-up extended over just a few years. Those patients are probably older and with more severe underlying heart disease as compared to asymptomatic AF patients recognized by chance during a clinical evaluation. Thus, the trial data do not necessarily apply to younger patients without heart disease or to patients who are prone to deteriorate over time if left in AF. As AF ablation has become a more mainstream therapy, the clinical population has broadened providing us with greater insight into the potential efficacy.

Prevention of Heart Failure

It was long appreciated that long-term AF may also lead to tachycardia-induced cardiomyopathy with symptoms and signs of heart failure (HF).[54] Rapid ventricular rate, loss of atrioventricular synchrony and irregularity of RR intervals are the primary mechanisms that adversely affect ventricular function and hemodynamic status.[55] Prompt sinus rhythm restoration may improve left ventricular systolic function and reverse tachycardiomyopathy.

It is likely that the benefits of sinus rhythm are counterbalanced by toxicity of AADs combined with their limited efficacy, particularly

in HF patients. On the other hand, AF ablation has been shown to reverse AF-related cardiomyopathy,[55-57] and to prevent cardiomyopathy development in earlier stages of AF. The potential benefits of restoring and maintaining sinus rhythm, including a lower risk of heart failure and a better quality of life may partially explain why recent surveys demonstrated that cardiologists tend to offer a rhythm-control strategy in the majority of patients with primary diagnosis of AF.[58-59] Given the potential adverse effects from long-term anti-arrhythmic therapy in HF patients, a non-pharmacologic approach with catheter ablation might be a promising strategy for this subset of patients.[60]

Role of AF Ablation. Soft and Hard End-Points Matter

Silent AF is likely to be associated with morbidity and mortality rates not inferior to symptomatic AF,[26,34,38]therefore, elimination of AF has the potential to reduce that risk. It is not uncommon that AF is found incidentally on admission for stroke and a significant proportion of patients presenting with stroke has AF that was not previously recognized (Table 2). However, maintaining SR with AADs might be ineffective due to the potential side effects of pharmacological therapy that may in fact increase mortality. On the other hand, AF ablation is highly effective in maintaining freedom from AF in the majority of patients without the need for AADs, so beyond symptomatic relief the impact of AF ablation on hard end points such as stroke, cardiovascular events or death needs to be clarified.

Published studies have demonstrated that asymptomatic patients are more frequently males with non-paroxysmal AF of lower ventricular rates.[38] But other studies demonstrated that factors associated to asymptomatic episodes include female sex, paroxysmal AF, younger age and negative emotions.[67-69] It is therefore difficult to identify a clinical profile of the patient who would be more or less likely to manifest symptoms. Recently, in a large study of first-diagnosed non-valvular AF patients, Potpara et al.[38] showed that patients with CHA_2DS_2–VASc = 0 had a 2-fold greater risk of asymptomatic presentation of incident AF compared to those with CHA_2DS_2–VASc score >0. Of note, this study demonstrated in a 'real-world' setting, that although patients with asymptomatic AF have a more favorable baseline profile, they have a greater risk of progression to permanent AF and a trend towards an increased risk of ischemic stroke despite OAC. As reported by Potpara and colleagues in their paper: "these findings raise the question of whether AF ablation (with recent improvements in AF ablation techniques) should be the first-line treatment for asymptomatic AF patients, since a non-invasive rhythm control could be less efficient in these patients".

The reduced mortality with sinus rhythm has also been demonstrated virtually in every study that has monitored this end point and there is emerging evidence that sinus rhythm restoration following AF ablation can provide clinical and prognostic benefits. In an international multicentre registry, Hunter et al.[70] demonstrated in 1273 patients that the ablation strategy is associated with lower rates of stroke and death compared to AF-patients treated medically. Rates of stroke and death were significantly lower in ablated patients (both 0.5% per patient-year) compared to those treated medically in the Euro Heart Survey. This observation is in line with the results from other smaller registries.[71-75] Furthermore, Winkle et al[76]have recently demonstrated that patients with prior stroke, who undergo successful AF ablation, have a low incidence of subsequent thromboembolic events and most of those patients may be able to discontinue OAC. The consistency of these findings suggests that, compared with pharmacological treatment, restoration of sinus rhythm by catheter ablation of AF is associated with lower rates of stroke and death.

Prognostic benefit of AF ablation is difficult to demonstrate due to the low-risk cohorts that have been selected for catheter ablation until recently and there are no randomized controlled trials examining this problem. Short-term studies might not have a sufficient statistical power to detect an effect on morbidity and mortality; this will be possible in long-term large trials enrolling patients at relatively high risk for AF-related complications. The multicentric Catheter Ablation vs Anti-arrhythmic Drug Therapy for Atrial Fibrillation (CABANA) trial[77] is prospectively investigating the long term effect of catheter ablation on mortality compared to medical therapy. This trial aims to randomize worldwide 3000 high-risk AF patients (≥65 yo or <65 with >1 risk factor for stroke) to a strategy of catheter ablation versus pharmacologic therapy (Rate or Rhythm Control). If this study show that AF ablation is superior to current state-of-the-art therapy with either rate control or rhythm control drugs, this will have massive implications even in patients with asymptomatic AF.

One additional issue deserves our attention. Patients with left ventricular dysfunction and suspected tachycardia-induced cardiomyopathy secondary to AF have been demonstrated to significantly benefit from atrioventricular-node ablation with pacemaker implantation, and biventricular pacing (CRT) has been shown to be more effective than right ventricular pacing.[78-80] The "Ablate and Pace" strategy is usually considered for patients with incessant and drug-resistant AF; however, the PABA-CHF trial[60] demonstrated the superiority of AF ablation as compared to atrioventricular-node ablation with biventricular pacing in HF patients. Of note, this study enrolled patients from 2002 to 2006 and in the meantime CRT technology has significantly evolved. In particular, we have moved from unipolar left ventricular leads to the currently available quadripolar technology that has been demonstrated to improve outcomes in CRT patients.[81-82] The "Ablate and Pace" strategy with multielectrode left ventricular leads has a higher likelihood of improvement after CRT; however, the additional benefit of the quadripolar technology in patients undergoing atrioventricular-node ablation remains to be proven.

Rhythm Control and Progression of AF: the Sooner the Better?

Older patients and those at the highest risk for stroke might benefit from an early ablative approach therapy when diagnosed with AF and may be the best candidates to screen for silent AF. However, the benefit on long-term mortality after sinus rhythm restoration in asymptomatic AF patients is not limited to older patients at high risk of stroke. Death and AF-related complications appear higher during the first months after the initial manifestation of AF.[4] Moreover, complication rates have decreased over the years in AF trials.[83] In younger AF patients with few comorbidities, there is some evidence that restoring sinus rhythm might improve long term survival; Wazni et al.[11] demonstrated that catheter ablation as first-line therapy in patients with new onset AF results in better outcome at one year compared to treatment with AAD, raising the possibility of using catheter ablation in AF management earlier than previously envisaged.

The natural history of AF recognizes different stages. In early stages, nonsustained episodes trigger-driven from pulmonary veins

are the rule. Overtime, atrial remodeling starts to occur and the new electro-anatomical substrate contribute to the development of longer arrhythmic episodes. Prompt restoration of sinus rhythm prevents long term left atrial structural remodeling that is associated with an increased risk of thromboembolism.[84] Therefore, AF ablation at earlier stages of the disease is more likely to succeed and has the potential to slow the progression of AF.[85-86] Bunch et al.[87] demonstrated on 4335 patients undergoing AF ablation that increasing time between first diagnosis of atrial fibrillation and treatment adversely affects long term outcomes. Additionally, the authors reported that AF-related outcomes such as heart failure and death tended to worsen with delays in rhythm management. These data in aggregate suggest that AF disease progression may be favorably impacted with early catheter ablation; if the intervention is driven only by symptoms, we might face in the operating room with more advanced stages of AF, requiring an extensive substrate modification, with a lower success rate and an increased risk of procedural complications.

Of note, a symptom-guided approach might be misleading because AF often worsens insidiously in mild symptomatic patients. Kawara et al.[88] retrospectively analyzed AF symptoms in patients with and without subsequent permanent atrial fibrillation. Interestingly, they reported that permanent AF often develops in patients with mild rather than severe symptoms. Given the progression of AF and the associated atrial remodeling, treatment of AF at an early stage may mitigate the progression of AF from a treatable problem to a condition refractory to all therapeutic interventions.

The Importance of the Patient's Perspective

The aim of all medical treatments is to improve outcomes for patients but what does "improve outcomes" mean? Usually, there are many outcomes to a treatment: symptoms relief, reduced risk of death and disability, complications, economic impact and so on. How do we weight these different aspects of outcome to determine which treatment is preferred?

Clinicians continue recognizing the importance of patients' perspective in the assessment of health care treatments and the symptom burden associated with AF is a major consideration in the overall management of the arrhythmia. Symptoms are the major motivation for undergoing catheter ablation in patients with AF; however, does all therapies in AF have the sole indication of symptom relief? Of course the answer is no. Symptomatic improvement has been frequently utilized in the evaluation of any therapeutic approach in AF patients; however, it has a low value in the clinical and prognostic care of patients.

The elusive relation between symptoms and arrhythmia recurrences suggests that symptoms may at times not be related to AF but rather an expression of other processes. Furthermore, it is well known that reliance on perception of AF by patients after AF ablation results in an underestimation of recurrence of the arrhythmia.[31,40] This makes symptoms and AF-related quality of life a potentially unreliable outcome parameter. The main topic is that AF is responsible for an increased risk of stroke and death, and elimination of AF normalizes that risk. More attention should be paid to the AF burden but less to the clinical symptoms, and treatment should be delivered accordingly.

The Experience of AF Ablation in Patients with Asymptomatic AF: the IRON AF Study.

We have recently evaluated the safety and the efficacy of catheter ablation in asymptomatic AF patients using data taken from a large Italian registry (IRON-AF). Although the study was limited by its retrospective design, it represents the first analysis of the effect of catheter ablation in patients with subclinical AF so far reported.[89] In this 'real-world' cohort, 545 consecutive patients referred for AF ablation guided by the NavX system (St. Jude Medical Inc., St. Paul, MN, USA) were prospectively enrolled.[90] Of these patients, 54 were determined to have subclinical AF; the control group was the remaining 486 patients who had symptoms. Analyses of efficacy, safety and outcomes of AF ablation revealed that the procedure in asymptomatic patients was safe and effective and performed as well as ablation in their symptomatic counterpart.

An important point of interest that emerged from this multicenter registry is represented by the relatively high number of asymptomatic patients undergoing "off-label" AF ablation. Reasons to ablate asymptomatic patients include young age, prevention of embolism and avoidance of cardiomyopathy, raising the possibility that this might reduce mortality rate. Another potential explanation for this finding is that one of the goals of AF ablation in an asymptomatic population is to eliminate the need for long-term anticoagulant and AAD therapy. Since this study was performed in 16 centers, the results are representative of a broad general experience with AF ablation; therefore, it is likely that referrals of asymptomatic patients for catheter ablation of AF are on the rise.

Assessment of Ablation Success in Patients with Silent AF.

Monitoring for arrhythmia recurrences after silent AF ablation is a key component of postablation follow-up not only to assess its real overall efficacy but also to tailor the therapeutic strategy for the individual patient. Systematic, standardized ECG monitoring has been shown to be of value in asymptomatic patients; however, it is recognized that the more intensively a patient is monitored and the longer the period of monitoring, the greater the likelihood of detecting AF recurrences.

Several methods of follow-up are available that range from 1 to 7 day Holter monitoring to implantable monitors that can provide extended periods of continuous monitoring. While external continuous monitoring systems provide limited temporal assessment, the implantation of a leadless cardiac monitor represents the gold standard for long-term AF surveillance, facilitating reliable assessment of asymptomatic AF episodes.[91-92] Since AF recurrences may occur during the first years after ablation,[93] the use of these tools for objective AF documentation might represent an optimal postablation monitoring strategy. Furthermore, even if currently available devices require a minimally invasive implant technique, this technology is evolving and in the near future small injectable devices will be available. Considering the technological improvements and the battery longevity (up to 6 years), these devices might be used as an objective and cost-effective postoperative assessment.

Safety Concerns of AF Ablation in Asymptomatic Patients.

In evaluating any treatment, one must balance the rewards and the risks. Asymptomatic patients have largely been excluded from AF ablation trials because of concerns regarding safety and efficacy of catheter ablation. Controversies exist with regard to the procedural safety of AF ablation; reports from high volume centers claim very low complication rates even though several major adverse events in patients undergoing catheter ablation for AF have been reported

also by experienced operators. Because of the relative risk of the procedure, there is quite a reluctance to refer or perform AF ablation procedures in asymptomatic AF patients.

Despite increasing experience, procedural risks of ablation are diminishing but are not insignificant.[94] Largely for these reasons, current guidelines recommend catheter ablation in patients with AF-related symptoms. The major benefit of catheter ablation for AF remains symptomatic relief, with few data supporting a reduction in mortality or stroke. This prompt an important question: is AF a modifiable risk factor for increased mortality? If so, catheter ablation should be considered in AF patients regardless of symptoms. The ongoing CABANA trial will provide a definite answer to this question.

Conclusions:

Asymptomatic AF is common and could lead to devastating consequences, including thromboembolic stroke and left ventricular dysfunction. Currently, there is some evidence suggesting that AF ablation warrants consideration as a therapeutic option in asymptomatic patients, although this remains to be proven. The selection of asymptomatic patients for AF ablation may depend on the balance of risks to benefits in individual patients and more attention should be paid to the AF burden. Large randomized trials are warranted to better define the role of catheter ablation in treating asymptomatic patients with AF.

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