LETTER FROM THE EDITOR IN CHIEF

Dear Readers,

This issue of *Innovations in Cardiac Rhythm Management* features a look at some of the more complex procedures and patient populations that we are tasked with managing in our daily practices. In particular, I would like to provide commentary on the topic of improving long-term cognitive function in patients with atrial fibrillation (AF). I have recently spent a great deal of time pondering this subject. In fact, I have been asked to speak on this exact topic at the China Atrial Fibrillation Symposium, which takes place this month. It was also a pleasure to collaborate with my colleague, Dr. Jared Bunch, in preparing a manuscript on this topic that is featured in the Atrial Fibrillation section of this issue. It has truly been a fascinating journey to partner Dr. Bunch on multiple articles evaluating this topic over the last few years.

The relationship between AF and dementia is a critically important topic. We are truly witnessing an AF epidemic, given our aging population and our increasing rates of obesity. As outlined in the aforementioned article by Dr. Bunch, there is a clear and real association of AF and dementia. My worry is that, with time, we are also going to witness a dementia epidemic, as the risk factors for both conditions are very similar.

I would like to focus the commentary in this month’s letter on two very new concepts when considering how to improve the long-term cognitive function in patients with AF, namely that of cerebral microbleeds in the elderly and silent ischemic strokes following AF ablation. An interesting question is whether the treatment options that have a documented benefit for AF, anticoagulation, and catheter ablation could paradoxically increase the risk of long-term dementia in AF patients.

While the concept of a cerebral microbleed is very familiar to neurologists and stroke specialists, I suspect that most electrophysiologists are not as familiar with it yet. These cerebral microbleeds are much different from the usual intracranial hemorrhages that we are all familiar with, which are easily diagnosed by a computed tomography scan. Rather, cerebral microbleeds are seen by magnetic resonance imaging (MRI) and usually defined as a focal bleed less than 5 mm in size. Microbleeds typically occur as a result of vessel rupture at the capillary, small artery, or arteriolar levels in the basal ganglia or subcortical white matter. Most cerebral microbleeds are asymptomatic, and are also very common, as MRI and autopsy studies have shown that up to 67% of elderly patients have endured them.1 Unfortunately, the greater the burden of cerebral microbleeds, especially in the lobar area, the more likely it is that there will be cognitive impairment.2

How do cerebral microbleeds relate to AF management? The risk of cerebral microbleeds is increased with antiplatelet or anticoagulation therapy. Even more significant is the risk of cerebral microbleeds with warfarin.3 Could it be that the sacrosanct anticoagulation therapy for AF may decrease the risk of stroke, only to result in an increased risk of cerebral microbleeds and dementia later in life? This certainly raises a number of questions, such as should our risk–benefit analysis of anticoagulation therapy be more than just ischemic stroke reduction versus increase in intracranial hemorrhage? Should we factor in the increased risk of all forms of cerebral hemorrhage, including both traditional intracranial hemorrhage and cerebral microbleeds?

I suspect most cardiologists are aware that the risk of intracranial hemorrhage is basically cut in half with the use of one of the newer anticoagulants (dabigatran, rivaroxaban, or apixaban) when compared with warfarin.4–6 Is it possible that these anticoagulants also have a lower risk of cerebral microbleeds? While it is reasonable to suspect that the new anticoagulants will have a lower risk of cerebral microbleeds than warfarin, at this time it is unknown if this is indeed the case.

In a manuscript published within the Atrial Fibrillation section of this month’s issue, Dr. Bunch presents a study involving 4,212 consecutive AF ablation patients at Intermountain Healthcare. This manuscript notes that if the AF is...
ablated, then the long-term increased risk of dementia is the same as if the patient never had AF. While there are many potential explanations for this finding (which are outlined in the article), it is also possible that by eliminating AF and discontinuing anticoagulation therapy the long-term iatrogenic risk of cerebral microbleeds can be eliminated. I think the take home message regarding cerebral microbleeds is that this is a very real risk in the elderly patient population, especially while undergoing anticoagulation therapy.

The second area I wish to comment upon is the asymptomatic stroke risk reported following AF ablation. With diffusion-weighted MRI (DW-MRI) studies, acute ischemic events can be easily diagnosed. Indeed, DW-MRI can detect silent embolic events in 7–38% of patients following AF ablation. The risk of silent embolic events seems to be associated with the technique and catheters used. Fortunately, 94% of these silent strokes have completely resolved by MRI 3 months later. While strokes, even if asymptomatic, cannot be healthy to long-term cognitive function, fortunately these silent strokes have not yet been associated with dementia.

I must admit that the concept of asymptomatic strokes has been very puzzling to me. Having personally performed well in excess of 2,000 AF ablation procedures, I have yet to see a new “asymptomatic stroke” or new silent brain lesion following ablation. Over the years, either I or my emergency room physician colleagues have ordered well in excess of 60 brain MRI studies immediately following one of my AF ablation procedures. I have also discussed this with my electrophysiology colleagues at our institution, none of whom have witnessed a silent ischemic event following AF ablation.

I have often wondered why our institution has not observed any of these silent strokes. In considering this, I have reviewed our cranial MRI study techniques and noticed our radiology colleagues are certainly performing high-quality studies that should be able to detect silent ischemic events immediately following AF ablation. Since these MRI studies are being conducted properly, I am left to conclude one of two things: perhaps we have selected the wrong patients to order MRIs following ablation, or perhaps there is something unique to our approach that decreases the risk of asymptomatic brain lesions after ablation.

Assuming the concept that there is something unique to our technique that minimizes the risk, I am left to conclude that this is potentially due to one of the following reasons.

1. All patients are fully anticoagulated with a goal AC of greater than 300 prior to transseptal access.

2. As soon as the ablation catheter and circular mapping catheter are placed in the left atrium at the beginning of the case, the transseptal sheath is kept out of the left atrium for the remainder of the procedure. Thus, no sheaths are left in the left atrium for the duration of the AF ablation procedure.

3. We only use the irrigated tip ablation catheter with irrigation set at the maximum flow rate of 30 ml/min during ablation.

It is quite possible that the reason we have not seen any silent strokes following AF ablation is due to one or more of the possible explanations above, or perhaps it is due to something else altogether. Regardless, we now have a low threshold to perform a brain MRI immediately following AF ablation. Hopefully, we will not experience any of these asymptomatic strokes following AF ablation.

I hope that you enjoy the articles published within this issue, and that this content offers support to your practice. Please feel free to build upon this content by sharing your innovative and complex experiences.

John Day, MD, FHRS, FACC
Editor-in-Chief
The Journal of Innovations in Cardiac Rhythm Management
JDay@InnovationsInCRM.com
Director of Heart Rhythm Services
Intermountain Medical Center
Salt Lake City, UT
References

8. Calkins H, Kuck KH, Cappato R, et al. 2012 HRS/EHRA/ECAS expert consensus statement on catheter and surgical ablation of atrial fibrillation: recommendations for patient selection, procedural techniques, patient management and follow-up, definitions, endpoints, and research trial design: a report of the Heart Rhythm Society (HRS) Task Force on Catheter and Surgical Ablation of Atrial Fibrillation. Developed in partnership with the European Heart Rhythm Association (EHRA), a registered branch of the European Society of Cardiology (ESC) and the European Cardiac Arrhythmia Society (ECAS); and in collaboration with the American College of Cardiology (ACC), American Heart Association (AHA), the Asia Pacific Heart Rhythm Society (APHRS), and the Society of Thoracic Surgeons (STS). Endorsed by the governing bodies of the American College of Cardiology Foundation, the American Heart Association, the European Cardiac Arrhythmia Society, the European Heart Rhythm Association, the Society of Thoracic Surgeons, the Asia Pacific Heart Rhythm Society, and the Heart Rhythm Society. *Heart Rhythm* 2012; 9:632–696.e21.