

THE AFIB REPORT

Your Premier Information Resource for Lone Atrial Fibrillation!

NUMBER 132

JUNE/JULY 2014

14th YEAR



Our third issue of 2014 was unavoidably delayed a month due to a combination of a pair of pre-planned events prior to my taking over editorial duties last January, including a several week European trip, followed by several unwelcomed surprises in succession with a serious fire near Sedona forcing relocation to Phoenix for a time. And last, but certainly not least, a small cerebral vascular event that happened to me in May and which forced sudden trips to first Austin, and then to La Jolla over the last month in order to complete the requisite imaging and analysis to identify that this TIA was, indeed, the result of a late-forming leak in my previously sealed left atrial appendage (LAA), nine months subsequent to my initially successful Lariat LAA

ligation last August.

We'll take a thorough look at the lessons learned from this Lariat experience in the next issue in August after I have gone through a repair procedure toward the end of July at Scripps Clinic to plug a 4mm diameter leak in my LAA seal. My Lariat closure had been affirmed as tightly sealed during the actual procedure last summer, and via two subsequent TEE tests at both 6 and 10 weeks post procedure, and yet clearly reopened slightly many months later, becoming the apparent source of my small cerebral infarct event. Stay tuned for the full story in the August issue.

In this issue, we start with summaries of two interesting reports right up our alley with a review of complementary and alternative treatments for arrhythmias. This survey conducted jointly by teams at two large medical centers in the US, offers an encouraging look at how allopathic disciplines are taking greater interest in understanding the potential therapeutic properties of herbal formulas and other modalities considered 'alternative'. It also highlights important warnings and caveats for the end user of such agents as well.

Our second and final study review follows in a similar 'holistic' track, if you will, with an important finding regarding the place for stringent life-style modification methods in conjunction with, in this case, catheter ablation and/or anti-arrhythmic drugs for those with pre-existing metabolic syndrome and/or obstructive sleep apnea. Once again, as with the first review in this issue, the central message of being open to using every viable tool available to us, when appropriate, in the battle for sustained NSR is reinforced by this recent study from the largest ablation research center in the US.

We wrap up this issue of The AFIB Report with a Case Study of a long-term friend of mine whom I followed from onset of his recent diagnosis of persistent AFIB through an ablation by Dr. Andrea Natale, witnessed first hand and in person to convey a bit of personal color and a sense of what it is like going through the process since this is one of the more common inquiries on our website forum; "what is an ablation process really like?" This procedure also contained some unusual factors as well including a patient with a significantly enlarged left atrium, which only a relatively smaller number of EPs would typically even attempt to ablate at that size. I trust you each find something of interest and relevance in this issue.

Finally, I much appreciate the patience shown with my unavoidable delay in publishing this issue and we aim to have things pretty much back on schedule going forward.

Wishing you all good health and lots of NSR!

Shannon

Review of Complementary and Alternative Medical Treatment of Arrhythmias

GREENVILLE, SOUTH CAROLINA & ROCHESTER, NEW YORK. This review of CAM (Complementary & Alternative Medicine) treatments of arrhythmia by the Departments of Medicine at both Greenville Health System and University of Rochester Medical Center under the research of Andrew Brenyo MD from Greenville and Mehmet K. Aktas MD at Rochester, provides a thorough overview of some of the principal complementary and alternative agents and modalities that demonstrate a recognized antiarrhythmic therapeutic effect.

The importance of this investigation is underscored by the large and growing interest by patients in both herbal and largely non-pharmacological alternatives to common AAR (anti-arrhythmic) drugs, which are often taken without their physician's supervision or even knowledge.

Indeed, it comes as little surprise to long time readers of *The AFIB Report* that many otherwise highly-skilled and excellent physicians lack in-depth training and a workable knowledge of many of these CAM agents to begin with, making for not only a potentially awkward doctor/patient relationship around such use, but one that could prove dangerous for the patient without proper and competent informed supervision.

The purpose, therefore, of this laudable review is to better enlighten both the end-user and physician alike as to the anti-arrhythmic properties of the various herbal agents (as well as acupuncture and yoga) in order to help prevent drug interactions and other possible adverse events with commonly used AAR drugs, as well as with other classes of cardiovascular drugs used in this group of patients in traditional 'standard of care' allopathic AFIB and VT therapies.

While the list of CAM agents with AAR effects in the following table derived from this review is not exhaustive, it does cover a majority of those agents that have been identified in the available PubMed medical literature and that are popular in alternative circles. Most of them have also been discussed on the www.afibbers.org forum on occasion.

And most importantly, the agents presumed anti-arrhythmic behavior and CAM/Drug interactions are noted in the following table, after which, we'll briefly take a bit closer look at a few of the most important and popular of these formulas.

CAM Therapies with Anti-Arrhythmic Properties

Mechanism of Action	Anti-Arrhythmic Behavior	CAM/Drug Interactions
Barberry (Berberine)	Class 1A – Class 3	CYP34A inhibitor; similar to grapefruit: ↑ statins, calcium channel blockers, estrogen etc.
Hawthorn	Class 3	↑ Digoxin activity, inhibit thromboxane. A2: more bleeding on OAC drugs
Chichona (multiple quinone alkaloids)	Class 1	CYP34A inducer; ↓ tegretol, levels etc.
Khella (source of amiodarone)	Class 3	Multiple; similar to amiodarone
Motherwort	Class 3	Risk of bleeding ↑ on anti-platelet or OAC drugs
Wenxin Keli	Atrial selective Class 1	Unknown – not studied
Omega 3 - PUFA	? Possibly class 1, 2 or 4	Rare ↑ in INR with Coumadin
Acupuncture	? Possibly class 2	None
Yoga	? Possibly class 2	None

Barberry is a shrub-like plant common to temperate climates ranging from the northeastern US to Europe, Asia and Africa. Typically, both the root and berries are used to extract a significant percentage of the diversely bioactive alkaloid '**berberine**'.

Berberine produces potent vaso-dilatory and antiarrhythmic action as well as having anti-oxidant, anti-inflammatory and blood sugar-stabilizing effects. In addition, berberine possesses strong antibacterial, antiviral and antifungal properties. No wonder it has been such a prized herb by healers of one sort or another, including Ayurvedic and ancient Chinese medicine practitioners, for over 2,500 years.

An increasingly popular and successful present day use of berberine is as a natural alternative to the drug Metformin, proving to be a close equivalent in diabetes and insulin resistance management. In some cases, berberine therapy has even helped reverse, or greatly control, cases of type 2 diabetes. It also helps lower hyperlipidemia, reduce blood pressure, and has been used in some cancer therapies as well.¹

Berberine is basically a one-stop tonic for addressing the constellation of signs and symptoms defining 'metabolic syndrome' (MS) ... as noted in the randomized, double-blind, placebo controlled trial footnoted above ... and with which AFIB has a close association sharing many of those same signs and symptoms as we will see in our second study review in this issue, examining MS and obstructive sleep apnea in relation to AFIB ablation.

When considering berberine's use as an anti-arrhythmic drug (AAR) substitute, please remember that it has potent Class 3 AAR like effects, not unlike a bit weaker form of sotalol, yet without the beta-blocker effects of that drug. As such, I strongly recommend you avoid combining berberine with any other AAR drug, or any other cardiac drugs for that matter ... or at least not without guidance from a skilled physician. Berberine has cytochrome P450-3A4 (CYP3A4) inhibition activity as well, so you must also be careful when using it with the many drugs that metabolize through the CYP3A4 enzyme system.

I once took a small dose of berberine years ago in an effort to gain better control over my then still active AFIB than I was getting at the time on a modest dose of 81mg of sotalol twice a day. Within an hour, I felt like I had taken a much larger dose of sotalol and had to lay down for several hours feeling borderline bradycardic to the limit of my pacemaker setting at the time, and with some added ectopics.

On it's own, berberine could indeed be useful in some cases for mitigating arrhythmia occurrence, intensity or duration, but be very cautious and only experiment ... if you are at all so inclined ... under the supervision of a physician or naturopath who is very familiar with both berberine and AFIB. And don't mix berberine with other drugs it might interact with, including being careful combining its use with any blood-thinning drugs.

This warning about mixing drugs goes equally for any of the herbs with AAR properties mentioned in this review, some of which also interact with the CYP3A4 enzyme system for metabolic assimilation and drug detoxification.

Wenxin Keli is a popular concoction of 5 herbs from China where it is sold as a licensable treatment for AFIB, ventricular tachycardia, PVCs, cardiac inflammation and heart failure. Recent studies in the west have confirmed Wenxin Keli's ability to suppress AFIB in dogs via a unique semi-selective depression of atrial 'INa' channels that prolongs the atrial effective refractory period. While this formula of complimentary herbs appears to offer compelling possibilities for treatment of cardiac arrhythmias, it remains to be fully studied in a rigorous and thorough manner so it's full benefits and possible risks yet remain to be better understood.

¹ Perez Rubio, KG Effect of Berberine Administration on Metabolic Syndrome, Insulin Sensitivity and Insulin secretion. [Metab Syndr Relat Disorders](#). 2013 Oct;11(5):366-9. doi: 10.1089/met.2012.0183.

All of the CAM agents with AAR properties listed in the table above, including **Khella** from which the gold standard AAR drug amiodarone is directly derived, are best classified based on their general class of AAR behavior and major interactions, as are listed in this table. Thus, the value of this table is providing a helpful starting point for those wishing to further investigate the possible benefits and risks of these agents for lessening AFIB and other cardiac health support.

Hawthorn is perhaps the best known and most widely used of these herbs today that are reviewed here. It has a plethora of cardiovascular benefits based on positive inotropic and vaso-dilatory effects as well as prolonging action potential through inhibition of inward potassium channels IKs & IKr. An effect similar to the action of Class-3 AAR drugs like sotalol and amiodarone, and has been used as a cardiac tonic dating back to 1st century Greece.

Omega 3 Fatty Acid's documented impact on reducing new-onset AFIB post myocardial infarction, has been well covered in past issues, so we won't repeat those details now. However, it's worthwhile noting a relatively new report of a rare dramatic increase in INR after taking Omega 3s in a large enough dose. While this effect is not a frequent problem it should be duly noted.

This review of the literature also further confirms what has been reported in past issues of our newsletter regarding ancient practices such as **Acupuncture** (of the **Neiguan**, **Shenmen** and **Xinshu** points), and **Yoga** that have both now shown well-documented benefits in soothing autonomic nervous system (ANS) tone, along with its corresponding impact on helping to sustain a quiet heart without resorting to any drug or herbal biochemical.

Brenyo A. & Aktas M. Review of Complementary and Alternative Medical Treatment of Arrhythmias. American Journal of Cardiology 2014;113:897-903 <http://dx.doi.org/10.1016/j.amjcard.2013.11.044>

Editor's comments: It is good news that cardiologists and EPs are clearly getting the word about these potent CAM agents that have long been in the field and in use, and certainly are becoming better educated in how these herbs and modalities work along with the potential risks and benefits of using them. Hopefully, rather than an outright dismissal at the mere mention of such alternative options, we will increasingly be able to have an informed and intelligent conversation with our doctors going forward on the possible pros and cons of expanding our horizons beyond the traditional pharmaceutical-only toolkit, when appropriate.

By the same token, we as patients need to respect the fact that most of these herbal agents can, and do, have potent cardiovascular effects and not all of them are necessarily beneficial in all circumstances just because they are deemed 'natural'.

Thus, while doing our part toward fostering a more rewarding pro-active relationship with our doctors, especially those that are clearly making the effort to better understand and learn about these agents they were not exposed to in medical school, we should be respectful as well when such a thoughtful physician who has done his or her own homework in this area has some reservations about our use of any one of these agents, and hear them out. They may well have a good reason for their caution. Nevertheless, I take heart in these signs that we are progressing to the point where we can have these conversations and it's not just a one-way 'roll of the eyes' response based on a misinformed idea of what is even possible with CAM agents outside the box that most physicians have traditionally been comfortable working within.

Long-term Outcome of Catheter Ablation of AFIB patients with coexistent Metabolic Syndrome and Obstructive Sleep Apnea: Impact of Repeat Procedures versus Life-Style Changes

AUSTIN, TX. FOGGIA, ITALY, NEW YORK, NY, BEIJING, CHINA, SAN FRANCISCO, CA, PALO ALTO, CA. LA JOLLA CA, CLEVELAND, OH. The implications and findings of this interesting

prospective study of 1,257 consecutive patients undergoing a first catheter ablation for AFIB between 2008 and 2011 out of one of the largest AFIB research centers in the world, touches at the very heart of the core philosophical and practical message of *The AFIB Report* and our website since its inception. That is, this study supports our strong recommendation for adopting a truly holistic approach, in the broadest and most inclusive sense of the word, for successful long-term management of AFIB.

Simply stated: AFIB, as a multi-factorial condition whose ultimate metabolic origins are not yet fully understood, and for which a clear and total cure still eludes us (though a successful expert ablation process can come awfully close to a functional cure), requires an open-minded and diverse approach toward treatment that includes all the best tools from cardiology, electrophysiology and allopathic medicine in general, in addition to dedicated efforts at appropriate life-style modifications. These include dietary improvement and nutritional/mineral repletion protocols and consistent moderate exercise as well as stress reduction modalities, as warranted. And all of which are working in concert toward the prime goal of achieving as much time spent in NSR as is possible in one's life.

The total cohort of patients for this study was divided into two groups. Group 1 (n=126, 64±8years, 76% male LVEF 55±12) had both Metabolic Syndrome and Obstructive Sleep Apnea (Group 1 = MS+OSA), while Group 2 (n=1,131, 62±11years, 72% male, LVEF 57±9) had either MS or OSA or neither comorbidity. Of the Group 2 cohort, 431 (38%) had only MS, 112 (10%) had only OSA and 588 (52%) were without MS or OSA. Patients with an established diagnosis of OSA were included in the study while those with a diagnosis of central sleep apnea or who were previous CPAP users (continuous positive airway pressure breathing device) were excluded.

The objective was to observe the influence of untreated OSA of varying degrees on ablation outcome. As such, only those OSA patients that had never used a CPAP machine were included. Metabolic Syndrome was defined based on previously described and accepted guidelines.

All patients who were free of arrhythmia breakthroughs at the end of the blanking period were taken off the AAR drugs given immediately after the index ablation. Those patients from both Group 1 and Group 2 who had continuing atrial tachyarrhythmia breakthroughs after the blanking period following the index ablation were divided into two further treatment protocols. Those who were experiencing only sporadic episodes (frequency intervals ≥ 2 month) after the blanking period, despite being on a previously ineffective AAR (anti-arrhythmic) drug during that 12 week period, were counseled and guided to adopt a stringent LSM (Life-Style management) program.

Those who experienced post-blanking period breakthroughs that were persistent or incessant (frequency intervals <2month) were subjected to redo-ablations without any LSM methods. All patients were then followed-up for a minimum of 1 year (20±6 months) after the redo-ablation or initiation of the LSM program.

Long-term procedural success was the primary endpoint for this study and was defined as freedom from AFIB (AF), atrial flutter (AFL), or atrial tachycardia (AT) of > 30 second duration and off all AAR drugs at follow-up, with the exception of any episodes that occurred during the first 12 week blanking period which are not inherently considered as recurrences.

The stringent LSM program consisted primarily of individual counseling and coaching sessions with a skilled clinical nutritionist who prepared personalized diet regimens based on the patient's comorbidities and preferences. For weight loss, when called for, the daily food intake was reduced by ≥ 500 calories depending on baseline body weight. In addition, the patients were strongly advised to adhere diligently to modest-intensity physical activity (150min/week of brisk walking at 15 min/mile pace).

That was it as far as LSM goes, and the positive results beg the question how much more effective an even more comprehensive program might be? Our long anecdotal history on the www.afibbers.org forum strongly suggests that an even more ambitious LSM program including more targeted nutritional and mineral repletion along with added stress reduction techniques such as meditation, tai chi and/or

yoga, as often recommended in this newsletter and on our forum, would almost certainly further underscore the advantages of adopting a consistent LSM protocol in lessening AFIB burden, particularly in the earlier stages of the disease.

Results ...

As expected, Group 1 had substantially higher prevalence of OSA as well as manifestations of MS, such as diabetes, hypertension, dyslipidemia and obesity. In addition, during the initial ablation non-PV triggers were significantly more prevalent in Group 1 patients at 87 (69%) vs. 621 (55%) in Group 2 $p=0.002$.

After the first ablation follow-up at (34 ± 8 months), 66 (52%) patients in Group 1 and 386 (34%) in Group 2 had experienced recurrences by the end of the long follow-up period. Within Group 2, recurrence was seen in 173 (40%) with MS-only, and 43 (28%) with OSA-only, while 170 (29%) experienced recurrences among those had neither MS nor OSA.

A total of 452 patients had recurrences of AF/AFL/AT after the index procedure; 194 of those having sporadic episodes with an average spacing of 4.4 ± 2 months despite being on an AAR drug, and this subgroup were subsequently treated with LSM plus continuance of the AAR drug. The remaining 250 patients who had recurrent episodes showed persistent recurrence and all of who subsequently underwent a second procedure. Eight patients were lost to follow-up, and among the 194 assigned to the LSM program, 24 people did not comply with the program guidelines; thus, only 170 were included in the LSM program analysis per-protocol.

For the first time, to my knowledge, in a peer-reviewed published study these results demonstrate that when MS and OSA are present concurrently they act synergistically to impose a more negative influence on AFIB ablation outcome than when either MS or OSA are present independently. Nevertheless, it has been well established previously, and reaffirmed in this study, that both MS and OSA are independent predictors for recurrence after catheter ablation for AFIB in any event, just not as robust a negative influence as when both co-morbidities are present. While this finding would seem rather obvious and commonsense, it is nonetheless rewarding to see that relationship validated in a rigorous prospective analysis such as done here.

Furthermore, and most importantly, this study showed conclusively that in patients having persistent post-ablation recurrence after a first ablation, and who then underwent repeat ablation, the long term outcome was comparable to those with more sporadic episode breakthroughs after the index ablation who did not have a follow up ablation, but instead continued with an AAR drug along with adopting LSM methods consisting of modestly stringent dietary and exercise protocols. This result has truly significant implications toward a more inclusive recognition by cardiologists and EPs of the role of both ablation and LSM as joint modalities working in concert for superior long-term results.

*Mohanty, S. et al, Long Term Outcome of Catheter Ablation in Atrial Fibrillation Patients with Coexistent Metabolic Syndrome and Obstructive Sleep Apnea: Impact of Repeat Procedures versus Life-Style Changes **Epub Ahead of Print: doi: 10.1111/jce.12468.***

Editor's comments: The bottom-line, from one of the largest ablation research centers in the world posting elite level results from catheter ablation, we are far from helpless victims in our battle with AFIB and can take personal steps to lessen our AFIB burden, often both before or after an ablation. This study underscores the value of adopting first, and foremost, even modest LSM efforts whose value is likely further enhanced the earlier in the disease process it is started. And, in addition, combining LSM efforts with the key step of an expert ablation process when the time comes, which is often an essential cornerstone for true long-term success in quelling AFIB for many patients.

These are facts we have preached here with real fervor for the last 14 years. Just don't underestimate the value of improving one's fitness, diet, and nutritional status, not to mention enhanced stress reduction skills, as this well-designed study results clearly emphasizes and confirms. It's never too late to make a real effort at positive LSM and the pay off in helping to keep the heart quieter can be

significant. Particularly in combination with an expert ablation process when LSM alone proves insufficient to get the job done.

Case Study: A first hand look at an expert persistent AFIB ablation

A couple months ago I received a call from a close friend from Hawaii who has been a buddy for 26 years. It was the kind of call increasing numbers of us on the forum have been reporting getting more often in recent years from friends and family members, and the kind we never want to receive.

When 'Tony' (not his real name) called two months ago, I could hear the disbelief in his voice as he had just come back from an aborted routine colonoscopy exam after having been diagnosed with asymptomatic persistent AFIB of which he had been totally unaware. Instead of his GI doc completing the colonoscopy, Tony had been referred to a local cardiologist for work up and at this early stage of the game understandably sounded rather flummoxed. Surely, there must be some mistake he felt, saying to his care givers who delivered the unwelcomed news: "... it's my friend Shannon who has had to deal with AFIB, not me". Sorry to have to welcome you to the club Tony!

Results of a thorough work up by his new local cardiologist made it clear he had a borderline bradycardic form of persistent AFIB. No wonder he wasn't aware of the irregular heart beats with only periodic reports of shortness of breath in recent years betraying his silent AFIB. Tony had also failed his first, and only, ECV (electro-cardioversion) attempt in less than a day (not a great sign), and was found on echocardiogram to have a very large dilated left atrium of 53mm diameter. All factors that instantly elevated him into the more challenging category of AFIB patients to treat and successfully return to sustained NSR.

The borderline low heart rate form of AFIB made prescribing many of the typical rate control and AAR drugs either moot, in the case of the former, or out of the question in the later case. Tony is a very successful PhD economist and a highly fit 64 year old who looks at least 10 years younger than his age. He also cherishes his very active outdoor lifestyle enjoying the many natural beauties and activities Hawaii is renowned for with his also fit and somewhat younger wife.

After digesting the realities of Tony's new found condition, and having heard the full list of options and prognostications available to him from his local cardiologist, and from yours truly, he expressed that his prime goal was, first and foremost, to do whatever was possible to regain consistent NSR as soon as possible.

Tony had always focused of a healthy life style with a good diet and solid nutritional repletion program. Indeed, I had sent him a copy of our '*The Strategy*' protocol some years ago and which he had faithfully followed ever since... and more. So there was nothing really to gain by adding that factor into the equation, other than to redouble his efforts at mineral repletion, which he did. It was clear, though, from all the factors above that Tony's best and only real chance to regain NSR was through an expert persistent AFIB ablation by the very best ablationist he could align with.

Tony frequently travels to San Francisco on business making it an easy call to strongly recommend he contact Dr. Andrea Natale's California Pacific Medical Center (CPMC) office in SF, as I know of no one in whose hands I would trust a case like Tony's more than Dr. Natale's with his world class skill and experience at ablating these very challenging kind of cases. Plus, the bonus of a convenient and familiar location for him there as well. In addition, I prepared him for a nice long wait-list of several months at least before he would likely get a slot set at CPMC.

Lo and behold, this is where the luck of the Irish must have intervened on Tony's behalf. He had been put on the new blood thinner Eliquis since shortly after diagnosis, and as such had been fully anti-coagulated at almost a full month, which turned out to be a big break for him. Just when he happened to call Dr Natale's office, a couple of cancellations had occurred leaving one free slot left that could not be readily filled in time by those in the most immediate que due to either the next few in line not being on

OAC drugs long enough, or for another reason could not make it to San Francisco on such short notice of just a couple days.

Tony's wife had only just left for Europe, where she is from, to visit her family there before Tony's lucky early option had suddenly materialized, and at the time he was faced with the prospect of having to go through this on his own. Knowing how much I valued having a close friend or family member there during my first procedure I certainly did not want him to possibly have to go through this alone, especially when this was all so brand new to Tony and he had not had several years to learn and prepare for all the ins and outs of what AFIB and ablations are all about.

So I flew up to San Francisco for a few days to serve as Tony's advocate, more as support really, just to keep things as comfortable for him as possible and answer the thousand and one questions so many of us are so familiar with that tend to run willy-nilly through our minds at the speed of light in the day or two before a first ablation.

To underscore the unusual nature of this scenario, many EPs will not even accept a person with a 53mm diameter left atrium as an ablation candidate, as in the past the odds of success long term were not that good. Dr Natale and his large group of colleagues who have recently pioneered work with these difficult cases, published a strong paper just last year showing excellent success rates in cases with such enlarged left atriums and persistent AFIB of unknown duration, though as expected, not infrequently requiring a two procedure process for long term success in the same ball park as those having more normal to mildly-expanded left atriums.

Tony's wife, having learned of his sudden ablation opportunity did make a heroic last minute whirlwind flight back from Europe, literally landing in San Francisco late the evening before his early morning procedure and returning to Europe two days after his hospital discharge.

During the two days prior to Tony's ablation, collectively we were able to get him up to speed as much as was possible in so short a time. This was assured not only from the excellent preparation work by Dr Natale and his highly capable staff led by Salwa Beheiry who is director of the AFIB center at CPMC, along with Morna, Miranda, Julie and Sandy the day before his procedure, but also from the time Tony and I had spent together in the Bay Area those two days answering his every question and 'what if'.

Fortunately, Tony is a quick study, and had picked up right away in his initial consult with Dr. Natale and Salwa the day before that he was indeed in great hands which only increased his confidence going forward.

An elite ablationist at work ...

An unexpected surprise and perk I received on the morning of Tony's ablation was an invitation by Dr. Natale to don the sterile blue 'Bunny suit and booties' and observe the entire ablation first hand. I had had the pleasure of witnessing short periods of Dr. Natale at work, as well as other top EPs, via broadcast video of live ablations at several of the EP conferences I attended earlier this year, but this was much more interesting witnessing the entire process close up with one of the true elites in the world of skilled ablationists at work. What a treat indeed.

The EP Lab and attached control room was a buzz with a well-orchestrated flow of activity by a good half dozen assistants, RN Lauren who oversees the EP-Lab while monitoring ACT levels and anesthesiologist Dr. Haerle, when I arrived, and all of whom moved with the calm and deliberate air of people who have done this thousands of times already. Certainly, one of the real advantages of going to the most experienced EPs you can arrange for yourself, in addition to the obvious one of his or her own rich experience level, is that the same holds true for every member of their team working on your case.

I have seen this dynamic in action first hand in having now had at least one minimally-invasive procedure or another, ranging from ablations to a Lariat procedure and a series of TEE tests spread between all three of Dr Natale's main clinics, including St David's in Austin, CPMC in San Fran and most recently at Scripps Green Hospital in La Jolla for the first time last week.

Understandably, a physician of Dr. Natale's experience and stature both demands and attracts only the highest caliber help, which only get better in the bargain though the high volume of experience each member continues to gain in working in such a top volume center. I have been very impressed with the similar level of expertise at all three centers.

Such a beneficial relationship is no doubt true as well between other top-tier ablationists and their staffs, which only underscores our urging people not to compromise any more than their circumstances demand when making such an important choice and decision. Stack the odds in your favor.

Tony had just been anesthetized and Brent along with EP Tech Dan, were just finishing preparing the equipment and catheters for insertion upon Dr. Natale's arrival in the lab that was filled to the brim with cutting-edge imaging and ablation technology.

Michelle, a Biosense Webster representative, who makes on-demand adjustments to software settings in their popular CARTO 3 electro-anatomical mapping (EAM) system at Dr. Natale's command during an ablation, was very kind in describing each step of the procedure to me as reflected in the readings from the various leads seen on the voltage map, as well as in the 3D reconstruction of Tony's left atrium.

Starting the actual ablation burns at 9:04am, Dr. Natale used a very fluid and unbroken pace while performing an extensive persistent AFIB ablation. There was no pausing to ponder or consider his next move as might be expected with a less experienced operator, and all was smooth sailing from the get go similar to a pro tennis player in the zone.

I was also struck by how effortless and rhythmic where his movements, watching Dr. Natale rock gently side to side from one foot to the other (possibly subconsciously to off-load the added weight of the heavy lead apron he and others close to the table must wear to minimize radiation exposure to themselves from fluoroscopy). With his left hand he would carefully adjust the two sheaths and catheters feeding into Tony's right femoral vein while simultaneously controlling the ablation catheter tip placement and angle with the control in his right hand. The rhythm and seamless flow of this concert looked very much like a violinist at work playing a duet with the images on the large bank of LCD screens directly above Tony's sleeping body while deftly dancing his AFIB to sleep.

Tools and Methods ...

The Natale procedure for persistent AFIB includes a standard PVAI of all four pulmonary veins along with isolation of the entire posterior wall as the first steps. He then starts to work on the rear half of the left atrial septal wall including any focal trigger points or CAFÉ's (complex fractionated electro-grams) discovered in real time mapping. Ablation work then continued along the mitral valve annulus and around the base of the left atrial appendage in Tony's case, yet without full isolation of the LAA in this procedure.

When Dr. Natale is ablating persistent AFIB, he often pairs the new Thermo-cool Smart-Flow catheter, as he chose in this case, with the ablation catheter tip at an angle to the tissue and in contact with the side of the lasso circular mapping catheter. Rather than applying ablation lesions or burns mostly with a more vertical downward 'dot by dot' motion as has commonly been done in the past, this configuration allows him to make a closer approximation of continuous ablation lines or lesions by dragging or gliding the catheter and lasso together in one movement.

This dragging method, also allows the ablationist to vary power and force depending on the variable wall thickness inside the left atrium at any area as he moves along. One result is potentially less inflammation edema, which can form more readily around each discrete dot from the burns. In turn, such round dots of inflammation around each burn can result in small gaps forming in between each 'dot' and thus potentially lead to small conduction leaks preventing truly trans-mural lesions. In any event, this is just one technique Dr. Natale and other top-tier operators employ to help achieve more consistent results.

Mind you, this was a very challenging kind of case that only the most experienced EPs would typically consider for ablation, and yet after roughly just 45 minutes of total ablation time an extensive amount of territory had been already covered when suddenly Tony's AFIB shifted to a flutter and with a few more moments of RF energy delivered, a specific red dot on the CARTO 3 map located around the base of Tony's LAA suddenly turned bright blue, marking the exact spot where he had just converted back to NSR! The control room where Michelle and Kyle (who operates both the RF generator for the ablation catheter as well as monitors esophageal temperature) were watching the CARTO 3 screen, both erupted into muted cheers and high-fives for a job well done.

The next phase after the core ablation was done, moved on to high dose isoproterenol (isuprel) drug challenge using 20mcg/min infusion for well over 20 minutes while Dr. Natale took off his lead apron and came into the control room to carefully watch the mapping signals, including some remnant signals originating from Tony's LAA, that had been strong and high amplitude earlier, and that he had chosen to only delay or reduce in size in this first ablation in hopes that it would hold steady during the long isuprel challenge phase and indefinitely post ablation.

Had those LAA signals grown in size and become more chaotic during the drug challenge, Dr. Natale would have gone back in and finished full isolation of Tony's LAA. Fortunately, these LAA signals held steady and remained well behaved through the entire isuprel challenge as well as the rest of the procedure. Indeed, the only area that had not been ablated yet, and that showed new repeatable and consistent trigger sources on isuprel challenge was in and around the coronary sinus, once again proving the invaluable function of drug challenge to ablation lesions when properly applied.

As such, Dr. Natale spent the final minutes of the procedure fully isolating Tony's coronary sinus and achieved the final end point he was looking of stable NSR including confirmed exit block around all four pulmonary veins and marking the end of an excellent morning's work.

A successful start ...

To wrap up the proceedings, a tiny new Medtronic's LINQs implantable loop recorder heart monitor was implanted in Tony's chest for 24/7 ongoing HR monitoring and feedback on demand to the ablation center at any time over the next three years. This is particularly handy in a patient like Tony who previously had asymptomatic AFIB and is thus not such a reliable reporter of any breakthroughs.

Interestingly, with the deep bradycardia noted during the early parts of the ablation while Tony was still in AFIB, it looked at first like he might require a pacemaker to overcome the apparent AV-node (atrio-ventricular node) delay, but Dr. Natale pointed out to me that he did not have wide spacing of his QRS wave and showed a healthy response to exercise so he did not bother with a pacemaker. Sure enough, after Tony came out of his ablation in NSR he had recovered a more normal heart rate ranging from the mid 60s to the mid 70s and is no longer in bradycardia.

Here was a very difficult case of persistent AFIB with a very large LA that was now beating in smooth NSR again after such a relatively short procedure, and continues to do so now one month later with Tony only having experienced a single two second blip of a PAC or PVC on day two post ablation and which he later attributed to a blood pressure drug he was asked to try. He had a perfect 12 lead EKG two days ago and his LINQ recorder has shown unbroken NSR since the moment that blue dot appeared on his CARTO 3 image during the ablation. Needless to say, Tony is one happy camper!

Tony fully realizes the odds are fair that he may still require a final touch up at some point, with having such a big LA to begin with, in order to truly put the beast to bed for the long term, but so far he is making a good bid, and a great start, for being 'one and done' as it is. Best of luck to you Tony!

And best wishes for continued NSR to all of our readers. We'll meet again with our next issue in August.

Shannon Dickson

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THE AFIB REPORT is published 6 times a year by
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