

Less is More in Atrial Fibrillation Ablation Trends: Fewer Repeats, Shorter Procedures, and More Patients.

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Abstract

In this issue of the Journal, Kushnir, et al. provide a report of temporal trends in first time ablation at a large academic medical center over a 10 year period. This editorial provides commentary on the report.

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The incidence of atrial fibrillation (AF) is increasing significantly, with estimates of 1.2 million new cases in the United States in 2010, rising to 2.6 million new cases annually in 2030 and a lifetime risk of 1 in 4 individuals.¹ The benefits of AF ablation have been demonstrated in a number of clinical trials^{2, 3} and guidelines increasingly support offering ablation as early line therapy in appropriately selected patients.⁴⁻⁶ The combination of rising new AF diagnoses and greater acceptance of AF ablation in widening demographic groups has led to significant growth of this procedure. In the setting of this growth, it is important to have a continual accounting of efficacy and safety as technology and procedural strategies evolve.

In this issue of the Journal, Kushnir et al. provide a report of temporal trends in 5,407 first-time AF ablations at a large academic medical center over a 10 year period (2011-2021).⁷ The primary analysis focused on efficacy as measured by time to redo AF ablation and correlations were made with changes in technology and ablation strategy. The primary endpoint, time to redo ablation or DCCV, decreased significantly over time (22% to 14%), and this occurred despite a doubling of persistent AF (22% to 44% representation) in the cohort. Additional observations were also made. The Annual AF ablation volume increased significantly during this time frame (>135%). The authors also report low major adverse event rate over time (1.1%) despite an increase in median age and co-morbidities which may suggest an improvement in safety given the potential for higher risk of complications in a sicker population. It is also worth noting that the study

population underwent radiofrequency ablation and it does not appear that any of the patients underwent cryoablation. Amiodarone was given to approximately 20% of the cohort throughout the time period, while Dronedrone was given to greater than 60% of the cohort in the earlier years with a significant decrease in later years.

How do the authors findings compare to previously reported literature? With regard to the incidence of repeat ablation, Piccini et al previously reported, in 2012, a repeat ablation incidence of 10.9% at one year in a cohort of 15,400 Medicare beneficiaries undergoing AF ablation.⁸ Assuming a constant annual incidence, the current, more contemporary cohort had an improved repeat ablation rate. The exponential increase in AFib ablation volume over time is also impressive and is similar to national and international trends.⁹

The low rate of major complications reported by the authors appears to be lower than in previously reported publications. Bohnen, et al. reported a major complication rate of 5.2% in a 2011 cohort from a large academic center.¹⁰ A later AF ablation cohort from 2015 reported a decrease to 2.3% in major complications.¹¹ Although the low adverse event rate in the current report is impressive, there were some differences in categorization of complications. The authors considered vascular complications to be those requiring surgical or catheter-based intervention. The earlier reports mentioned included additional vascular access complications such as retroperitoneal bleed requiring transfusion and extended hospital stay as a major adverse event even in the absence of procedural intervention, and inclusion of such events may have increased the reported complication rate. This is especially true because vascular complications tend to be the most frequent adverse event in reported previous series whereas in the current study pericardial effusion was the most common complication reported (0.46%).

What accounts for these improvements in ablation over time? The authors attribute improved success and efficiency to a multitude of changing technology and techniques. These include change in mapping technology, ventilation (jet ventilation), pacing strategy to improve catheter stability, and high power short duration settings. With regard to jet ventilation, it is worth noting that some centers have adopted a reduced tidal volume increased ventilation rate strategy which may be more simple.¹² Furthermore, the authors eliminated stepwise linear ablation strategies which appears to be consistent with current trends at many institutions and with large clinical trial data that has failed to show definitive advantage of additional ablation strategies beyond PVI in first time ablations^{13; 14}. Further, Muthalaly, et al also reported a time dependent trend in improved quality and safety in the setting adoption of forced sensing and irrigated catheters, and elimination of additional ablation lines.¹¹ As the authors mention in their discussion, empiric lines can also promote macro-reentrant arrhythmias and redo procedures. It would, therefore, seem appropriate for the standard of care to remain PVI and possibly targeting observed arrhythmias, but not to include additional empiric lines in first time ablations.

There are some additional limitations that are worth noting. First of all, the data comes from a high-volume center with experienced operators. These data may not be as generalizable to other centers. It may also be difficult to discern to what extent improving technology vs. improvement in experience was to account for the positive findings. In addition, use of time to redo ablation or DCCV may underestimate failure rates compared to an efficacy endpoint such post-procedure EKG and monitoring data. Given that many studies utilize a low level of AF on monitoring (e.g. 30s of AF on holter) the success rate would be perceived as greater in the authors study. It is also possible that some operators developed a greater appreciation over time of selected scenarios where repeat ablation or cardioversion was felt to be futile and some of the instances of “no redo or cardioversion” were from drop out of rhythm control strategy rather than efficacy. Nonetheless, the authors study demonstrates improvement from baseline which is relevant. Furthermore, 30 seconds of AF on a holter may be overly conservative and less clinically relevant than a longer amount of AF, symptomatic AF, or time to redo ablation. Also, the data was censored at 3 years. It may be informative to have longer follow up. While the adverse event rate was low in the cohort, it is not possible to comment on any decrease over time as complications data was not available from the first 4 years (2011-2015). Lastly, the authors conclusions about subcategories of patients, such as the observation of higher recurrence in

amiodarone treated patients, derives from non-randomized unadjusted data, and therefore should probably be ignored.

What could these findings lead to? Being able to convey to patients the sense of a safer, shorter, and more successful procedure is likely to increasingly favor choosing AF ablation over antiarrhythmic drugs. When success increases, procedure time decreases, complications decrease, many centers have developed a same day discharge strategy with excellent safety and success.¹⁵ Throw in the possibility of same day discharge vs. a multiple night stay for antiarrhythmic drug initiation and the choice weighs further in favor of ablation.

In summary, the authors provide an excellent perspective on how trends in AF ablation have evolved in a manner of “Less is More”. Fewer redo ablations, shorter procedure time, low complication rates and more, and more patients.

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