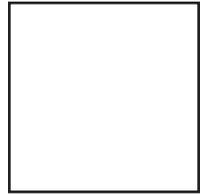




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(continued from inside)

Using this hybrid approach has been accompanied by substantial clinical response rates, which is particularly notable given that the patients were selected for their predicted refractoriness to standard approaches. In the first 50 patients treated with this hybrid ablation technique, 80% have had a clinical response, eliminating AF and/or the need for antiarrhythmic drug in most. The complication rate has been acceptably small and no different than standard AF ablation.

Our group has championed this novel treatment, now available at Hackensack-Meridian University Medical Center. The hybrid ablation program in development is being led by Dr. Steinberg and Dr. Mark Anderson, Chief of Cardiac Surgery, to optimize the technique and adjunctive management for these complex patients.

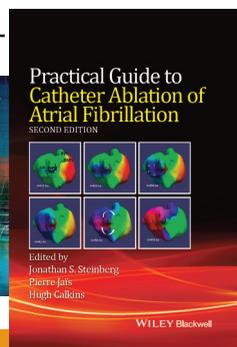
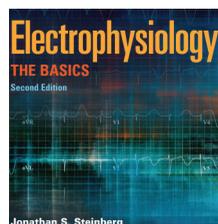
In summary, if a patient (1) has failed one or more PVI ablation procedures or (2) has long-standing persistent AF, the hybrid approach may be their best bet for a meaningful response. Please contact the SMG Arrhythmia Center if you have any questions.

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2. Verma A, Jiang CY, Betts TR, Chen J, Deisenhofer I, Mantovan R, Macle L, Morillo CA, Haverkamp W, Weerasooriya R, Albengue JP, Nardi S, Menardi E, Novak P, Sanders P, for the STAR AF II Investigators. Approaches to catheter ablation for persistent atrial fibrillation. *N Engl J Med* 2015; 372:1812-1822.

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ArrhythmiaNews

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Ablation Options for the Most Challenging Patients: A Hybrid Strategy Incorporating Minimally Invasive Surgery and a Transvenous Catheter Approach

Catheter ablation has achieved substantial success in suppressing atrial fibrillation (AF) in many patients who have not responded to drug therapy (class I indication) or who prefer a non-pharmacologic approach (class IIa indication). This strategy principally relies upon pulmonary vein isolation (PVI) to fuel the response because most patients' AF is triggered by firing within the PVs. Our published experience indicates that up to 80% of patients will respond completely, with AF eliminated allowing discontinuation of medical therapy. Overall about 95% will have complete relief or substantial reduction in symptom burden; quality of life is demonstrably improved.

There are however subsets of patients who do not respond favorably or have exhausted standard interventional efforts. For these patients, it is important to employ a thoughtful and individualized approach, not simply one that repeats prior ineffective or unproven tactics.

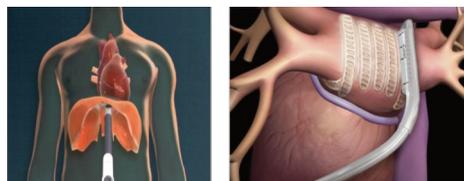
There are two groups of patients who are the most challenging: (1) Patients with long-standing persistent AF and (2) Patients who have failed more than 1 PVI procedure. The former, if treated by conventional PVI usually with additional substrate modification, can be expected to have a low procedural success rate, a need to have multiple procedures, and continued requirement of antiarrhythmic therapy. The latter requires unproven alternative ablation strategies, most of which when tested rigorously are no better than no intervention.

For example, two mainstays of these "additional substrate modification" approaches have been targeting "complex fractionated atrial electrograms" ("CFAE" lesions) located bi-atrially, and linear left atrial ablation (typically across the roof and the mitral "isthmus"). Despite their common deployment, a large multicenter randomized clinical trial recently showed that adding these components to PVI were no better than PVI alone, yet with a longer

procedure time and risk for complications.

Most recently, enthusiasm was palpable for mapping and targeting atrial "rotors," stable small rapid reentrant circuits, hypothesized to be the drivers of AF. Rotor ablation requires specialized mapping equipment (Abbott, Inc.) and coordination with standard radiofrequency energy delivery. Following initial favorable reports, we were given access to this equipment as one of the early adopters. Unfortunately, our independent experience failed to confirm earlier findings, and indeed we observed no acute AF terminations and a poor long-term outcome. We have now abandoned using this system due to inefficacy. Instead, we now believe that a novel "hybrid" approach may represent the best hope for the two categories of patients described above.

The first component of this hybrid approach is designed to obliterate the electrical activity of the left atrial posterior wall. The posterior wall encompasses the region between pairs of PVs and has the same embryologic origin. As a result, it has similar electrophysiologic properties to the PVs and commonly harbors or generates the wavelets responsible for AF. Electrical isolation by catheters requires large numbers of lesions and often leaves gaps that can then generate new and troublesome atrial tachycardias, clinically more problematic than AF. Instead, using minimally invasive sub-xiphoid access, the surgeon can both visualize the target region and place a series of contiguous lesions that blanket the posterior wall in an effort to silence the region (Figure).



The second component involves transvenous catheter access to the left atrium. The PVs

are sampled to ensure isolation (if attempted previously) or to perform PVI (if not done before). In addition, the posterior wall is mapped to ensure electrical silence and to touch-up any islands of electrical activity if found.

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