

Surgical Ablation for Atrial Fibrillation: The Chaos Continues

Ralph J. Damiano, Jr., MD

John M. Shoenberg Professor of Surgery

Chief of Cardiac Surgery

Vice Chairman, Department of Surgery

Barnes Jewish Hospital

Washington University School of Medicine

St. Louis, MO USA

Surgical Ablation for AF: The Opportunity

- AF is the most common arrhythmia in the world, afflicting between 0.4 – 2.0% of the general population, and an estimated 6 million Americans.
- The incidence increases with age, and the prevalence approaches 10% in patients over the age of 80.
- It is commonly seen in patients referred for cardiac surgery.

Preoperative Incidence of AF by Procedure: Washington University 1986-2005

Procedure	Preoperative Incidence of Atrial Fibrillation
CABG (n = 8065)	10%
Mitral Valve (n = 952)	33%
Aortic Valve (n = 1223)	22%
CABG + Aortic Valve (n = 700)	21%
CABG + Mitral Valve (n = 517)	36%
CABG + Mitral Valve + Aortic Valve (n = 76)	38%

Shen J, et al.
JTCVS 2011;141:559-570

Surgical Ablation for Atrial Fibrillation in Patients Undergoing Concomitant Surgery: The Current Sad State of Clinical Practice

- The introduction of ablation devices has revolutionized the surgical treatment of AF.
- AF surgery has gone from one very difficult operation performed well in a few centers with high success rates (the Cox-Maze procedure) to a plethora of different procedures performed in many centers often with poor results.
- A significant number of patients receive inadequate or illogical operations, performed with inappropriate or untested devices without proper indications. It has been estimated that only one third of patients with AF receive any surgical therapy at all.

Surgical Ablation of AF:

The Critical Clinical Problems

- Surgical ablation devices are all used off-label and most were released on the market for use without any experimental validation of their safety or efficacy for ablation of atrial tissue. The result has been poor success rates, a number of devices withdrawn from the market (i.e. laser, microwave, dry unipolar RF), and avoidable collateral ablation damage resulting in significant patient morbidity.
- The balkanization of lesion sets has led to a practice anarchy and the feeling that any atrial lesion pattern is appropriate for treating AF despite a lack of demonstration of clinical efficacy.

Surgical Ablation of AF: The Key Research Gap

- In order to develop a procedure that is as effective or better than the Cox-Maze procedure with less invasiveness, we must develop an understanding of the mechanisms of AF in each individual patient.
- One approach to this challenge would be to develop diagnostic modalities to allow us to define noninvasively atrial anatomy and electrophysiology, allowing for the identification of a patient-specific AF phenotype. Subsequently, this information could be used to create computer models to examine ablation efficacy before intervention, and to triage patients to appropriate treatment strategies and clinical trials.