Characterizing Recurrence Following Hybrid Ablation in Patients with Persistent Atrial Fibrillation

David Kress, MD; Lynn Erickson, MS1; Firas Zahwe, MD; Tadele W. Mengesha, MS3; David P. Krum, MS3; Jasbir Sra, MD1

1Aurora Cardiovascular Services, Milwaukee, WI; 2Aurora Research Institute, Milwaukee, WI

PROBLEM

Atrial fibrillation (AF) has been found to be a major contributor to stroke and mortality (1,2), and hospitalizations for AF have increased two- to threefold over the past several years (3).

BACKGROUND

It is widely accepted that AF accounts for a majority of arrhythmia recurrences in endocardial catheter AF ablation. An epicardial-endocardial approach (hybrid) has emerged as an alternative to endocardial ablation alone for the treatment of AF, yet recurrence and effect of prior ablation on hybrid outcome has not been well characterized.

OBJECTIVE

This retrospective study aimed at characterizing recurrence following hybrid ablation for patients with persistent AF.

METHODS

108 consecutive hybrid patients (mean age 61±10 years) with persistent AF received both endocardial and epicardial ablation of the posterior left atrial wall using a subxiphoid approach (Fig1). AF-free survival estimate for single procedure success at 12 months was defined as no arrhythmia following the initial 3-month blanking period. To determine time to arrhythmia, if ambulatory monitoring was not used in the patient, electrocardiogram results during each follow-up visit were collected. Overall 12-month AF-free survival allowing for a repeat procedure was defined as no recurrence following a repeat atrial flutter (AF) ablation succeeding hybrid ablation. Effect of prior ablation (n=60) on patients with persistent AF receiving the hybrid ablation was also studied.

RESULTS

Patients were followed for a mean (±SD) of 25 (14) months and antiarrhythmic drug use at follow-up was 51%. Of patients that recurred (n=62), 39% (n=24) were in AFL and 47% (n=29) were in AF (Fig 4). Of those that recurred with AFL, 14 patients received repeat ablation for either left (n=11) or left/right (n=3) AFL. Single procedure success at 12 months was 64% and median (Q1, Q3) freedom from recurrence (95% CI) was 21 (12, 27) months (Fig 6A). Allowing for a repeat catheter ablation for AFL following the hybrid ablation, 12-month AF-free survival increased to 70% (Fig 6B). The mean number of ablation procedures for patients with prior ablation was 1.53. AF-free survival at 12 months following the hybrid ablation was not significantly different between those who had prior ablation and those who did not (p=0.5) (Fig 6A and 8).

CONCLUSIONS

AFL accounts for about half of hybrid recurrences, whereas in endocardial ablation alone AFL occurs in 25% recurrences at our center. Repeat ablation for AFL increases the overall hybrid 12-month AF-free survival to 70%. Furthermore, ablation prior to the hybrid procedure did not affect AF-free survival post hybrid ablation in this study population. This suggests that hybrid ablation may be a first line therapy for AF and is a suitable alternative to endocardial ablation alone.

REFERENCES


![Figure 1: A. Epicardial lesion set delivered with saline irrigated rewith suction adherence to atrium. B. Pericardioscope access point](image1)

![Figure 2: A. Pre-epicardial ablation voltage map of the posterior left atrial (LA) epicardial surface. B. Post-epicardial ablation voltage map of the posterior LA epicardial surface. Both maps were created before any endocardial ablation was performed. Areas of low voltage are shown in red.](image2)

![Figure 3: Baseline Characteristics](image3)

![Figure 4: Mode of Recurrence Following Endocardial and Hybrid Ablation](image4)

![Figure 5: Characterizing Repeat Ablation for Atrial Flutter Following the Hybrid Ablation](image5)

![Figure 6: 12-Month Survival Following Hybrid Ablation in a Population With and Without Prior Ablation](image6)

![Figure 6A: Kaplan-Meier (KM) survival curve of the 12-month arrhythmia-free survival for a single hybrid ablation procedure. B. KM curve of the 12-month arrhythmia-free survival allowing for 1 atrial flutter ablation.](image7)