Hybrid Totally Thoracoscopic Ablation of Persistent And Long-Standing Persistent Atrial Fibrillation With Depressed Ejection Fraction: A Single Center Observational Study

Kiankhooy, A. et al. (2022). JTCVS Open, 12:137-146.

Introduction

A single site, retrospective analysis by Dr. Kiankhooy and colleagues was conducted to determine if hybrid ablation could restore normal sinus rhythm in a higher-risk patient population with advanced atrial fibrillation (AF), depressed left ventricular ejection fraction (LVEF), and heart failure.

Methods

A total of 40 persistent (35%) and longstanding persistent AF (65%) patients with pre-existing AF-related tachycardia-mediated cardiomyopathy, LVEF <40% and worsening heart failure (NYHA II, 90%; NYHA III, 10%) were evaluated. All patients in this analysis underwent staged hybrid thoracoscopic epicardial ablation followed by endocardial RF ablation. In addition to bilateral pulmonary vein and left atrial posterior wall isolation, patients had their Ligament of Marshall divided and left atrial appendage (LAA) excluded with the AtriClip® LAA Exclusion System. Standard continuous monitoring methods were employed to evaluate recurrence of atrial arrhythmias (AA) >30 seconds including EKG, implantable loop recorders, ZioPatch (iRhythm Technologies) or via pacemaker interrogations through at least one year of follow up. Pre- and post-hybrid ablation echocardiograms were performed to evaluate LA size and LVEF.

Results

Results demonstrated freedom from AA recurrence off class I/III AAD in 65% (26/40), 71.4% (25/35), and 62.5% (15/24) at one, two and three years, respectively. In addition, freedom from AF with or without antiarrhythmic drugs (AAD) or subsequent intervention was 85% (35/40), 88.6% (31/35) and 87.5% (21/24) at one, two and three years, respectively (Table 1). More than two-thirds (67.6%, 23/34) of patients were off oral anticoagulation and 82.3% (28/34) were off AAD at the last follow-up.

Table 1. Atrial Arrhythmia Outcomes

	Freedom from AA Recurrence off Class I/III AAD	Freedom from AF Irrespective of AAD or Additional Intervention
1 year	65%	85%
2 years	71.4%	88.6%
3 years	62.5%	87.5%

AA = atrial arrhythmias; AAD= antiarrhythmic drug; AF = atrial fibrillation

At mean follow-up of 3.0 + 1.5 years after hybrid ablation, mean LVEF significantly improved by 12%, with 14 (35%) patients achieving full LVEF recovery of ≥55%. Mean left atrial size was reduced by 0.4 cm and worsening heart failure improved nearly one NYHA functional class (Table 2).

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Table 2. Heart Failure Outcomes

	Pre-Hybrid Ablation	Post-Hybrid Ablation	P-value
LVEF	34.5 ± 5.9%	46.5 ± 12.8%	<0.001
LA size	5.25 ± .84 cm	4.82 ± 1.01 cm	0.0078
NYHA class	2.10 ± 0.3	1.45 ± 0.64	<0.0001

LVEF = left ventricular ejection fraction; LA= left atrial; NYHA=New York Heart Association

Key Takeaways

- Significant improvements occurred in LVEF, NYHA functional class, along with a reduction in absolute left atrial size and freedom from AF recurrence off class I/III AADs in the majority (60%) of patients at one year.
- Staged, hybrid thoracoscopic ablation to treat patients with non-paroxysmal AF and tachycardia-mediated heart failure had an acceptable safety profile. No stroke or death occurred in the cohort.
- These results suggest that hybrid thoracoscopic ablation in patients with AF-related tachycardia-mediated cardiomyopathy is feasible to restore normal sinus rhythm and may benefit LVEF as well as reduce left atrial size.

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AtriClip® LAA Exclusion System Indications:

Not all lengths and models are available in all countries.

Argentina, Belarus, Brazil, Chile, Colombia, Hong Kong, Korea, New Zealand, Serbia, South Africa, UAE and UK: *AtriClip LAA Exclusion System is indicated for open occlusion of the heart's left atrial appendage.*

Canada: *The AtriClip LAA Exclusion System is indicated for the occlusion of the left atrial appendage, under direct visualization, in conjunction with other open cardiac surgical procedures.*

EU Region: *The AtriClip LAA Exclusion System is indicated for use in patients at high risk of thromboembolism for whom left atrial appendage exclusion is warranted.*

Japan: *This device is intended for the occlusion of a left arterial appendage on cardiovascular surgeries in thoracotomy or thoracoscopic for patients with a risk of thrombosis embolism related to atrial fibrillation and so on.*

U.S: *The AtriClip LAA Exclusion System is indicated for the exclusion of the left atrial appendage, performed under direct visualization[1], in conjunction with other cardiac surgical procedures.*

[1]Direct visualization, in this context, requires that the surgeon is able to see the heart directly, with or without assistance from a camera, endoscope, etc., or other appropriate viewing technologies.

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