

Summary of “Hybrid Convergent Ablation for Atrial Fibrillation: A Systematic Review and Meta-Analysis”

This systematic review of two literature databases and meta-analysis led by Dr. Felix Yang (Maimonides Medical Center, Brooklyn, NY) evaluated current published data on the safety and effectiveness of contemporary Hybrid Convergent procedures. Patient characteristics, procedural details, clinical outcomes at ≥ 1 year follow-up, and major adverse events (MAEs) were collected. Meta-analysis using a random-effects model was performed to aggregate data.

A total of 249 publications were identified and screened resulting in an analysis of 5 observational studies and the CONVERGE randomized controlled trial; **Table**). These studies included 551 patients. Seventy-three percent were male, mean ages ranged from 61–69 years, 96% had symptomatic persistent or longstanding persistent atrial fibrillation (AF), and where reported, most patients had failed at least 1 anti-arrhythmic drug (AAD). In 5 studies, Hybrid Convergent ablation was performed in a single setting, and in 1 study the procedures were staged by approximately 6 weeks. Authors noted a recent shift from transdiaphragmatic to subxiphoid pericardial access, the latter of which was used in 33% of cases. Endocardial ablation was performed with radiofrequency energy only (56%) or primarily cryoballoon (44%).

Meta-analysis of the 6 studies found freedom from atrial arrhythmias with or without AADs at 1-year or later was 69% (95% CI: 61–78%, n=523; Table). In 3 studies, freedom from arrhythmias off AADs was 50% (95% CI: 42–58%; n=343 patients; Table). AF burden after Hybrid Convergent ablation was qualitatively summarized with $\leq 5\%$ AF burden in 88–95% of patients at ≥ 12 -months follow-up in two studies, and $\geq 90\%$ reduction in AF Burden in 74% and 80% of patients at 12- and 18-months follow-up in CONVERGE. Meta-analysis found the pooled 30-day AE rate was 6% (95% CI: 4–8%, n=551; Table). No atrioesophageal fistulas, tamponade from cardiac perforations, or periprocedural deaths were reported. The most frequent event was pericardial effusion. These are typically delayed, inflammatory effusions (1–3 weeks after the procedure), likely in response to pericardiotomy and ablation, not cardiac perforation. In the 6 studies, 80% of these events were treated with pericardiocentesis or managed medically and 20% were treated with pericardial window. Risk mitigation strategies such as prophylactic anti-inflammatory drugs and post-procedure transthoracic and transesophageal echocardiograms were discussed. Two studies noted significantly decreased complication rates after transitioning to subxiphoid pericardial access.

The authors concluded that available published data support that hybrid convergent is an effective ablation strategy for treating patients with persistent or long-standing persistent AF.

Endpoint	Random Effects Meta-Analysis
Freedom from atrial arrhythmias at ≥ 1 year irrespective of anti-arrhythmic drugs (AADs) ¹⁻⁶	69% (95% CI: 61–78%, n=523 in 6 studies)
Freedom from atrial arrhythmias at ≥ 1 year off AADs ¹⁻³	50% (95% CI: 42–58%; n=343 patients in 3 studies)
30-day major adverse event rate ¹⁻⁶	6% (95% CI: 4–8%, n=551 in 6 studies)

¹De Lurgio et al. Circ Arrhythm Electrophysiol 2020.

²Makati et al. Circ Arrhythm Electrophysiol 2020.

³Macleane et al. Int J Cardiol 2020.

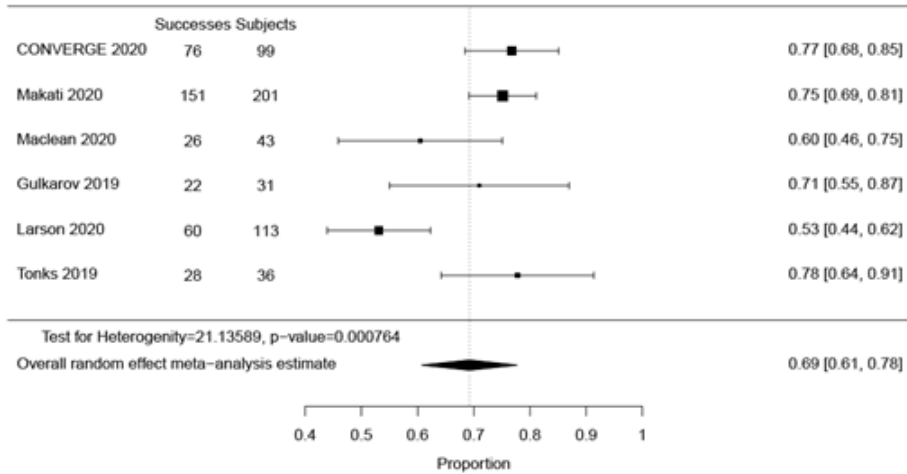
⁴Gulkarov et al. J Cardiac Surg 2019.

⁵Larson et al. J Cardiovasc Electrophysiol 2020.

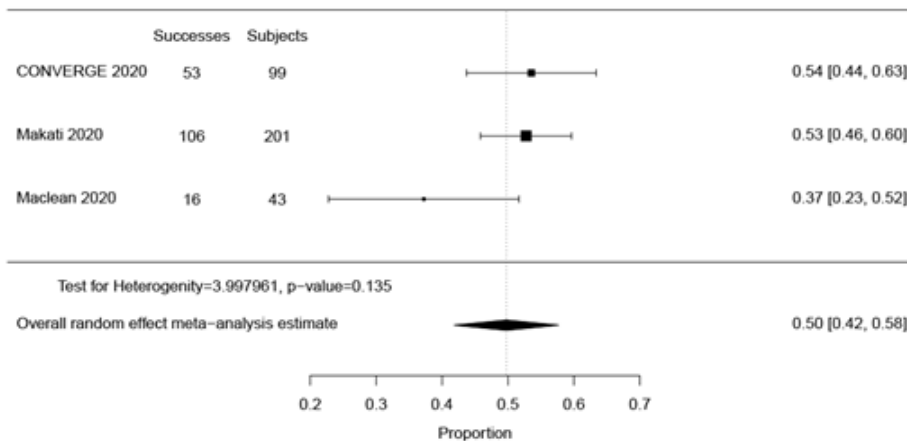
⁶Tonks et al. Ann Thorac Cardiovasc Surg 2020.

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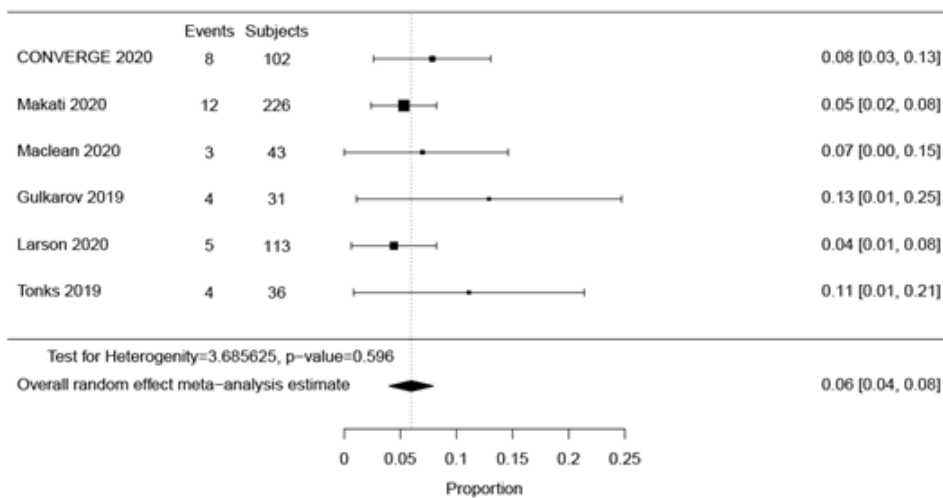
Freedom from atrial arrhythmias irrespective of AADs



Freedom from atrial arrhythmias off AADs



Major adverse event rate within 30 days



Reference: Shrestha, S. (2022). Hybrid Convergent Ablation for Atrial Fibrillation: A Systematic Review and Meta-Analysis. *Heart Rhythm* 02. 2022 May 16. <https://doi.org/10.1016/j.hrroo.2022.05.006>