

CRYO BALLOON

MAIN ARTICLES REFERENCES



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■ SAFETY

Sarabanda et al, Efficacy and safety of circumferential pulmonary vein isolation using a novel cryothermal balloon ablation system, *J Am Coll Cardiol*. 2005; 46:1902-1912

Su et al, Best practice guide for cryoballoon ablation in atrial fibrillation: the compilation experience of more than 3000 procedures, *Heart Rhythm*. 2015; 15(0):1-9

Shakkottai et al, Cryoablation for Atrial Fibrillation in 2017: What Have We Learned? *Heart Lung Circ*. 2017 Sep; 26(9):950-959

Rottner et al, Is less more? Impact of different ablation protocols on periprocedural complications in second-generation cryoballoon based pulmonary vein isolation, *Europace*. 2017 Jul 24

Aryana et al, Verification of a novel atrial fibrillation cryoablation dosing algorithm guided by time-to-pulmonary vein isolation: Results from cryo-DOSING Study (Cryoballoon-ablation DOSING Based on the Assessment of Time-to-Effect Pulmonary Vein Isolation Guidance), *Heart Rhythm*. 2017; 14:1319-1325

Iacopino et al, Second-generation cryoballoon ablation without the use of real-time recordings: A novel strategy based on a temperature-guided approach to ablation, *Heart Rhythm*. 2017; 14(3):322-328

■ EFFICACY

Neumann et al, Circumferential pulmonary vein isolation with the cryoballoon technique: results from a prospective 3-center study. *J Am Coll Cardiol*. 2008; 52:273-8

Neumann et al, Cryoballoon ablation of paroxysmal atrial fibrillation: 5-year outcome after single procedure and predictor of success, *Europace*. 2013; 15(8):1143-1149

Packer, et al, Cryoballoon Ablation of Pulmonary Veins for Paroxysmal Atrial Fibrillation: First Results of the North American Arctic Front (STOP AF) Pivotal Trial. *J Am Coll Cardiol*. April 23, 2013; 61(16):1713-1723.

Tondo et al, Pulmonary Vein Isolation Cryoablation for Persistent and Long-Standing Persistent Atrial Fibrillation Patients. Clinical Outcomes from Real World Multicentric Observational Project. *Heart Rhythm*. 2017 Oct 26

■ CRYO VS RF

Kuck et al, Cryoballoon or radiofrequency ablation for paroxysmal atrial fibrillation. (Fire and Ice study). *NEJM*. 2016; 374:2235-45.

Kuck et al, Cryoballoon or radiofrequency ablation for symptomatic paroxysmal atrial fibrillation: reintervention, rehospitalization, and quality-of-life outcomes in the FIRE AND ICE trial. *Eur Heart J*. 2016 Oct 7; 37(38):2858-2865

Schmidt et al, German ablation registry: cryoballoon vs radiofrequency ablation in paroxysmal atrial fibrillation – one year outcome data, *Heart Rhythm*. 2016; 13(4)

Chen et al, Cryoablation vs radiofrequency ablation for treatment of paroxysmal atrial fibrillation: a systematic review and meta-analysis, *Europace*. (2017) 19, 784-794

Ciconte et al, Electrophysiological findings following pulmonary vein isolation using a radiofrequency catheter guided by contact-force and second-generation cryoballoon: lessons from repeat ablation procedures, *Europace*. 2016 Jan; 18(1):71-7.

Aryana et al, Pulmonary vein reconnection following catheter ablation of atrial fibrillation using the second-generation cryoballoon versus open-irrigated radiofrequency: results of a multicenter analysis, *J Interv Card Electrophysiol*. 2016 Dec; 47(3):341-348

■ ECONOMIC VALUE

Klein et al, Comparison of anatomically designed and point-by-point catheter ablations for human atrial fibrillation in terms of procedure timing and costs in German hospitals, *Europace*. 2015; 17(7):1030-7

Chun et al, The impact of cryoballoon versus Radiofrequency ablation for paroxysmal atrial fibrillation on healthcare utilization and costs: an economic analysis from the FIRE and ICE Trial, *J Am Heart Assoc*. 2017 Sep 15; 6(9)

CRYO BALLOON

MAIN ARTICLES CLINICAL MESSAGES



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■ SAFETY

Sarabanda et al. – JACC 2005

A cryoballoon approach to PV isolation is attractive because isolation of PVs can be quickly performed through a simple anatomical approach based on balloon positioning at the PV orifice.

Su et al. - HeartRhythm 2015

Cryoballoon ablation of AF is a useful tool for PVI and antral modification. The specific technical recommendations discussed here will make the cryoballoon procedure a safer and more effective tool for treatment of AF.

Shakkottai et al. - Heart Lung Circ. 2017

Cryoballoon ablation is a safe and effective therapeutic modality for the management of drug refractory AF and is a viable alternative to the use of RF energy for PVI.

Rottner et al. – Europace 2017

The overall incidence of complications was 5.2% with major complications in 4.1% of the patients and PNP being the most frequent complication.

Aryana et al. - Heart Rhythm 2017

A novel Cryo-AF dosing algorithm guided by TT-PVI can help individualize the ablation strategy and yield improved procedural endpoints and efficiency as compared to a conventional, nonstandardized approach.

Iacopino et al. - Heart Rhythm 2017

A temperature guided approach based on achieving -40°C within 60 seconds is effective in producing PVI and affords freedom from AF at 12-month follow-up in 85% of patients affected by drug-resistant PAF.

■ EFFICACY

Neumann et al. – JACC 2008

Sinus rhythm can be maintained in the majority of patients with PAF by circumferential PVI using a cryoballoon ablation system.

Neumann et al. - Europace 2013

Sinus rhythm can be maintained in a substantial proportion of patients with PAF even 5 years after circumferential PVI using CB ablation.

Packer et al. - STOP AF - JACC 2013

The STOP AF trial demonstrated that cryoballoon ablation is a safe and effective alternative to antiarrhythmic medication for the treatment of patients with symptomatic paroxysmal AF, with risks within accepted standards for ablation therapy.

Tondo et al. - Heart Rhythm 2017

PVI cryoballoon ablation procedure was safe, effective, and efficient with regards to treatment of patients with persistent and long-standing persistent AF.

■ CRYO VS RF

Kuck et al. - Fire and Ice - NEJM 2016

Cryoballoon ablation was non inferior to radiofrequency ablation with respect to efficacy for the treatment of patients with drug-refractory paroxysmal atrial fibrillation.

Kuck et al. Eur Heart J. 2016

Patients treated with cryoballoon as opposed to RFC ablation had significantly fewer repeat ablations, direct-current cardioversions, all-cause rehospitalizations, and cardiovascular rehospitalizations during follow-up.

Schmidt et al. - Heart Rhythm 2016

AF recurrence rate at 1-year follow-up was similar in RF ablation compared to cryoablation.

Chen et al. - Europace 2017

Compared with RF ablation, cryoablation present a comparable long-term AF/atrial tachycardial-free survival and procedure-related adverse events.

Ciconte et al. - Europace 2016

The rate of late PV reconnection is significantly lower following cryoballoon ablation when compared with radiofrequency contact-force catheter ablation as index procedure.

Aryana et al. - J Interv Card Electrophysiol. 2016

Cryoablation was associated with greater durability of PV isolation as compared to open-irrigated, non-force sensing RF. Additionally, cryoablation itself emerged as a significant predictor of durable PV isolation with an AFA score considerably greater than RF.

■ ECONOMIC VALUE

Klein et al. - Europace 2015

FAST-PVI showed reductions in ablation procedural time may lead to increased hospital capacity and non-device-related cost-savings, while maintaining quality.

Chun et al. - J Am Heart Assoc. 2017

When compared with RFC ablation, cryoballoon ablation was associated with a reduction in resource use and payer costs, primarily attributable to fewer repeat ablations and a reduction in cardiovascular rehospitalizations with cryoballoon ablation.