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Comparison of cryoballoon and radiofrequency ablation techniques for atrial fibrillation: a meta-analysis.

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Abstract

AIMS:

To perform an updated meta-analysis to assess efficacy, safety and technical performance of pulmonary vein isolation using cryoballoon or radiofrequency catheter ablation in patients with paroxysmal or persistent atrial fibrillation.

METHODS:

In June 2017, databases and websites were systematically searched for systematic reviews, randomized controlled trials and observational studies reporting data on efficacy, safety and technical performance outcomes at follow-up at least 12 months. Researchers independently assessed records' eligibility, inclusion and methodological quality of included studies.

RESULTS:

Six randomized controlled trials and 25 observational studies - 11853 patients were included. Studies on paroxysmal atrial fibrillation were 29 and included 11635 patients. Meta-analysis results showed no difference between cryoballoon and radiofrequency in terms of recurrent atrial fibrillation [risk ratio 1.04, 95% confidence interval (CI) 0.98-1.10] or atrial tachyarrhythmias (risk ratio 1.04, 95% CI 1-1.08) and fluoroscopy time (mean difference -1.92min, 95% CI -4.89 to 1.05). Cryoballoon ablation was associated with fewer reablations (risk ratio 0.79, 95% CI 0.64-0.98), lower incidence of pericardial effusion (risk ratio 0.52, 95% CI 0.31-0.89) and cardiac tamponade (risk ratio 0.33, 95% CI 0.18-0.62) and shorter total procedural time (mean difference -23.48min, 95% CI -37.97; -9.02) but with higher incidence of phrenic nerve palsy (risk ratio 5.43, 95% CI 2.67-11.04). Prespecified subgroup analysis confirmed overall results as for freedom from atrial fibrillation and atrial tachyarrhythmias. Only two observational studies included patients with persistent atrial fibrillation, thus hindering any conclusion in this population.

CONCLUSION:

In patients with paroxysmal atrial fibrillation, cryoballoon and radiofrequency ablation produce similar results in terms of freedom from recurrent atrial fibrillation or atrial tachyarrhythmias but with a different safety profile, being cryoballoon ablation less associated with cardiac complications but more likely to cause phrenic nerve palsy.