Catheter ablation for treatment of patients with atrial fibrillation and heart failure: a meta-analysis of randomized controlled trials

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Introduction: There is little evidence for the effects of catheter ablation (CA) on hard endpoints in patients with atrial fibrillation (AF) and heart failure (HF).

Methods: PubMed, Embase and Cochrane Library were searched for randomized controlled trials (RCTs) enrolling patients with AF and HF who were assigned to CA, rate control or medical rhythm control groups. This meta-analysis was performed by using random-effect models.

Result: Seven RCTs enrolling 856 participants were included in this meta-analysis. CA reduced the risks of all-cause mortality (risk ratio [RR] 0.52, 95% CI 0.35 to 0.76), HF readmission (RR 0.58, 95% CI 0.46 to 0.66) and the composite of all-cause mortality and HF readmission (RR 0.55, 95% CI 0.47 to 0.66) when compared with control. But there was no significant difference in cerebrovascular accident (RR 0.56, 95% CI 0.23 to 1.36) between two groups. Compared with control, CA was associated with improvement in left ventricular ejection fraction (mean difference [MD] 7.57, 95% CI 3.72 to 11.41), left ventricular end systolic volume (MD -14.51, 95% CI -26.84 to -2.07), and left ventricular end diastolic volume (MD -3.78, 95% CI -18.51 to 10.96). Patients undergoing CA exhibited increased peak oxygen consumption (MD 3.16, 95% CI 1.09 to 5.23), longer 6-min walk test distance (MD 26.67, 95% CI 12.07 to 41.27), and reduced Minnesota Living with Heart Failure Questionnaire scores (MD -9.49, 95% CI -14.64 to -4.34) than those in control group. Compared with control, CA was associated with improved New York Heart Association class (MD -0.74, 95% CI -0.83 to -0.64) and lower B-type natriuretic peptide levels (MD -105.96, 95% CI -230.56 to 19.64).

Conclusion: CA was associated with improved survival, morphologic changes, functional capacity and quality of life relative to control. CA should be considered in patients with AF and HF.