

Catheter Ablation of Atrial Fibrillation in Patients with Concomitant Left Ventricular Impairment: a Systematic Review of Efficacy and Effect on Ejection Fraction



Anand N. Ganesan, MBBS, PhD¹, Savvy Nandal¹, Jakob Lüker, MD, Rajeev K. Pathak, MBBS, Rajiv Mahajan, MD, PhD, Darragh Twomey, MBBS, Dennis H. Lau, MBBS, PhD, Prashanthan Sanders, MBBS, PhD^{*}

Centre for Heart Rhythm Disorders (CHRD), South Australian Health and Medical Research Institute (SAHMRI), University of Adelaide and Royal Adelaide Hospital, Adelaide, Australia

Received 26 April 2014; received in revised form 17 September 2014; accepted 20 September 2014; online published-ahead-of-print 30 September 2014

Introduction

Catheter ablation of atrial fibrillation (AF) is an established rhythm control strategy; however, the impact of co-existing LV systolic dysfunction (LVSD) on ablation success is less well understood. This systematic review compiles the outcomes of catheter ablation of atrial fibrillation in patients with LVSD.

Methods

An electronic database (Pubmed, Scopus, Embase) search using the keywords 'atrial fibrillation AND ablation AND (ventricular dysfunction OR heart failure OR cardiomyopathy)' was performed for English scientific literature up to 01/01/2014. 2484 references were retrieved and evaluated for relevance by three reviewers. Reviews and reference lists of retrieved articles were also examined to ensure all relevant studies were included. Data was extracted from 19 studies, including a total of 914 patients.

Results

Single-procedure success in LVSD patients for AF ablation was 56.5% (95% CI: 48%–64%). Overall multiple-procedure (including the use of anti-arrhythmic drugs) in LVSD patients for AF ablation was 81.8% (95% CI: 75%–87%). The mean increase in LVEF following AF ablation was 13.3% (95% CI: 10.8%–15.9%). Seven studies reported improvements in exercise capacity and quality of life information using standardised criteria. The pooled rate of serious adverse events was 5.5% (95% CI: 3.7%–8.1%).

Conclusions

Catheter ablation may be an effective therapy in AF patients with left ventricular systolic impairment, and can be associated with improvements in left ventricular function, quality of life, exercise capacity, and modest rates of serious adverse events.

Keywords

Atrial fibrillation • Heart failure • Systematic review • Catheter ablation • Rhythm control

Abbreviations: AF, atrial fibrillation; HF, heart failure; LVEF, left ventricular ejection fraction; LVSD, left ventricular impairment; NYHA, New York Heart Association; PVAI, pulmonary vein antral isolation; PVI, pulmonary vein isolation; QOL, Quality of life

**Corresponding author at:* Centre for Heart Rhythm Disorders, Department of Cardiology, Royal Adelaide Hospital, Adelaide, SA 5000, AUSTRALIA.

Tel.: +61 8 8222 2723; Facsimile: +61 8 8222 2722., Email: prash.sanders@adelaide.edu.au

¹ denotes equal contribution

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Introduction

Heart failure (HF) and atrial fibrillation (AF) are intricately coupled clinical conditions. AF is common amongst HF patients, and is particularly prevalent in patients with higher NYHA functional class [1]. At least one in four newly-diagnosed AF patients may suffer from HF, and the development of AF in HF patients represents a significant risk factor for mortality [2,3].

In the past decade, catheter ablation has become established as a therapy for symptomatic, drug-refractory AF [4,5]. Current guidelines cautiously support AF ablation for patients with co-existent left ventricular impairment, suggesting that AF ablation may be considered in selected symptomatic patients with HF and/or reduced ejection fraction [4,5].

As such, the role of catheter ablation in AF patients with concomitant LVSD is not only an area of uncertainty, but an important management issue in the care of HF patients. There has recently been a significant increase in the number

of studies reporting clinical outcomes in AF and HF. The primary purpose of our study was to evaluate the efficacy and safety of AF ablation LVSD patients, as well as the impact of AF ablation on left ventricular ejection fraction (LVEF) and quality of life (QOL).

Methods

We searched the scientific literature in PubMed, Scopus, Embase, using the search terms “atrial fibrillation AND ablation AND (ventricular dysfunction OR heart failure OR cardiomyopathy)”. This search was supplemented by hand-searching of bibliographies and narrative reviews of AF and HF. The primary criterion for inclusion were studies reporting outcomes for percutaneous catheter ablation outcomes of AF in HF patients. Criteria for left ventricular systolic dysfunction case definition were left according to each study design. Randomised control trials, case control studies, and observational case series were included. Exclusion criteria included individual case reports, editorials, and

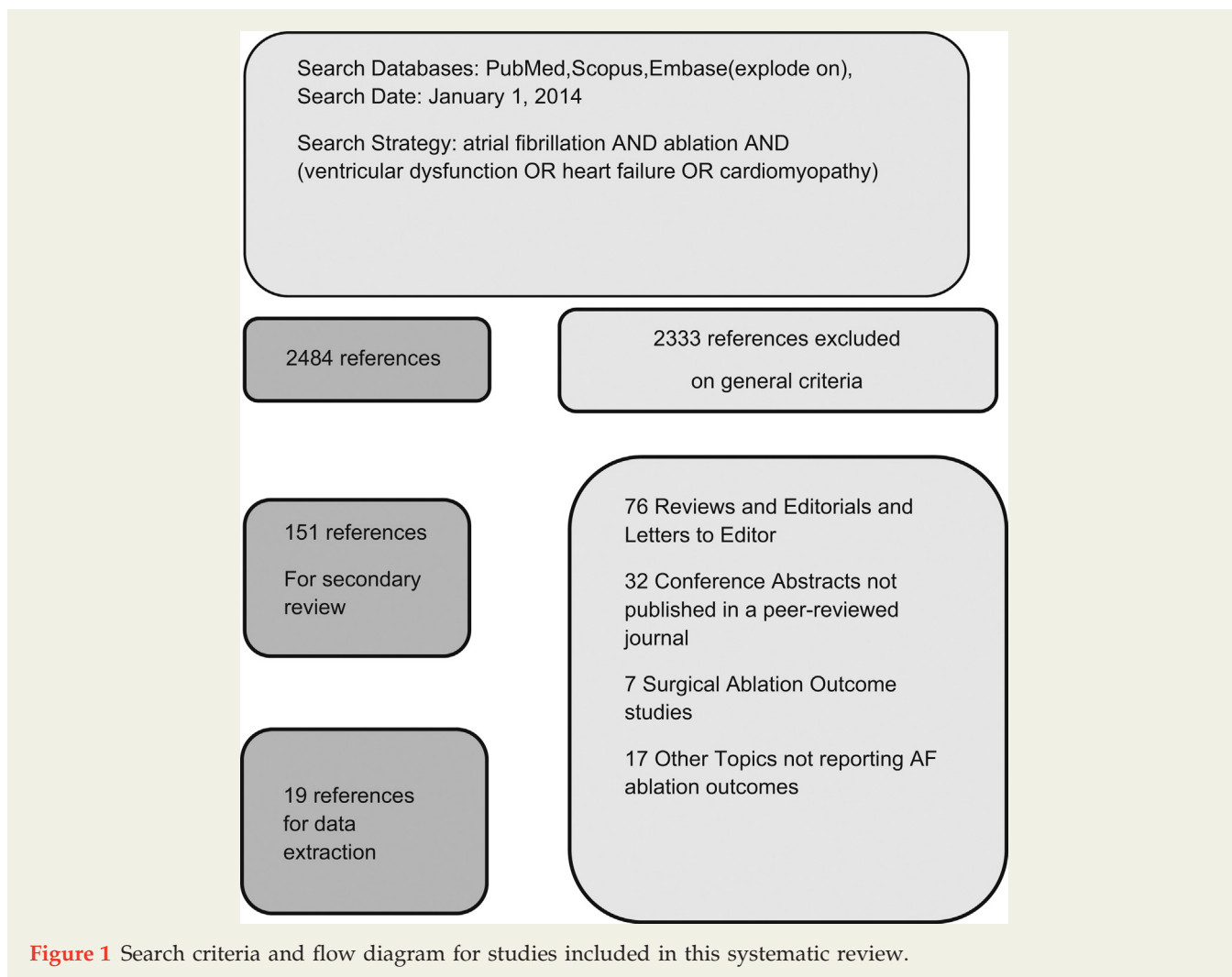


Figure 1 Search criteria and flow diagram for studies included in this systematic review.

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