Quality of life improves after thoracoscopic surgical ablation of advanced atrial fibrillation: Results of the Atrial Fibrillation Ablation and Autonomic Modulation via Thoracoscopic Surgery (AFACT) study

Antoine H. G. Driessen, MD,[a] Wouter R. Berger, MD,[b] Mark F. A. Bierhuizen, BSc,[b] Femke R. Piersma, RN,[b] Nicoline W. E. van den Berg, MD,[b] Jolien Neefs, MD,[b] Sébastien P. J. Krul, MD, PhD,[b] WimJan P. van Boven, MD, PhD,[a] and Joris R. de Groot, MD, PhD[b]

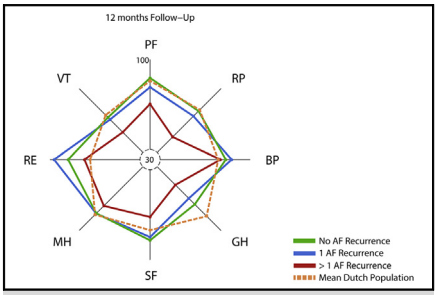
ABSTRACT

Objective: We evaluated health-related quality of life at 12 months after thoracoscopic surgical ablation in patients enrolled in the Atrial Fibrillation Ablation and Autonomic Modulation via Thoracoscopic Surgery study. The Atrial Fibrillation Ablation and Autonomic Modulation via Thoracoscopic Surgery study assessed the efficacy and safety of ganglion plexus ablation in patients with symptomatic advanced atrial fibrillation undergoing thoracoscopic surgical ablation.

Methods: Patients (n = 240) underwent thoracoscopic pulmonary vein isolation with additional ablation lines in patients with persistent atrial fibrillation. Subjects were randomized to additional ganglion plexus ablation or control. Short Form 36 quality of life questionnaires were collected at baseline and at 6 and 12 months of follow-up.

Results: A total of 201 patients were eligible for quality of life analysis (age 59 ± 8 years, 72% were men, 68% had an enlarged left atrium, 57% had persistent atrial fibrillation). Patients improved in physical and mental health at 6 months (both $P < .01$) and 12 months (both $P < .01$) relative to baseline, with no difference between the ganglion plexus (n = 101) and control (n = 100) groups. Short Form 36 subscores in patients with 1 or no atrial fibrillation recurrences were similar to those in the general Dutch population after 12 months. Patients with multiple atrial fibrillation recurrences (30%) improved in mental ($P < .01$), but not physical health, and 6 of 8 Short Form 36 subscales remained below those of the general Dutch population. Patients with irreversible, but not with reversible procedural complications had persistently diminished quality of life scores at 12 months.

Conclusions: Thoracoscopic surgery for advanced atrial fibrillation results in improvement in quality of life, regardless of additional ganglion plexus ablation. Quality of life in patients with no or 1 atrial fibrillation recurrence increased to the level of the general Dutch population, whereas in patients with multiple atrial fibrillation recurrences quality of life remained lower. Irreversible but not reversible procedural complications were associated with persistently lower quality of life. (J Thorac Cardiovasc Surg 2017;■:1-9)



Improvement of QoL in relation to recurrences of AF. A radar chart with the SF-36 scores of patients with more than 1 AF recurrence (*red*), 1 AF recurrence (*blue*), and no AF recurrences (*green*) is shown at 12 months follow-up after thoracoscopic AF surgery. Dutch population means are denoted by the *dashed orange lines*.

Central Message

QoL improvement after thoracoscopic surgery for AF relates to AF recurrences and procedural complications.

Perspective

By using the SF-36 questionnaire, we show that QoL improves after thoracoscopic surgery for AF. Patients with irreversible surgical complications or multiple AF recurrences demonstrated no improvement of QoL. A single AF recurrence was associated with the same QoL improvement as were no AF recurrences at all.

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From the [a]Departments of Cardiothoracic Surgery and [b]Cardiology, Heart Center, Academic Medical Center, University of Amsterdam, Amsterdam, The Netherlands.

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A.H.G.D. and W.R.B. contributed equally to this article.

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Address for reprints: Joris R. de Groot, MD, PhD, Heart Center, Department of Cardiology, Academic Medical Center, Meibergdreef 9, Amsterdam 1100 DD, The Netherlands (E-mail: j.r.degroot@amc.uva.nl).

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Abbreviations and Acronyms

AAD = antiarrhythmic drug
AF = atrial fibrillation
AFACT = Atrial Fibrillation Ablation and Autonomic Modulation via Thoracoscopic Surgery
BP = bodily pain (SF-36 scale)
ECG = electrocardiogram
GP = ganglion plexus
MCS = Mental Component Summary (summary of SF-36 scales)
PCS = Physical Component Summary (summary of SF-36 scales)
QoL = quality of life
SF-36 = Short Form 36

Scanning this QR code will take you to a supplemental video for the article.

Atrial fibrillation (AF) is the most common cardiac arrhythmia, estimated to affect 33.5 million people worldwide. Its prevalence is increasing as a result of the aging population and the improved survival of chronic cardiovascular disease.[1,2] Health-related quality of life (QoL) in patients with AF is generally lower than the population norms.[3]

Rhythm control with catheter or surgical ablation is recommended for patients remaining symptomatic despite a trial with antiarrhythmic drugs (AADs), and invasive AF treatment may improve QoL.[4] After catheter ablation, QoL has been reported to improve regardless of procedural success. It has been demonstrated that a substantial reduction in AF burden results in a significant improvement of QoL, whereas QoL changes less in patients with more AF recurrences.[5-7] Similar to catheter ablation, thoracoscopic surgery for AF is performed to achieve freedom of AF and may further even reduce risk factors for stroke and heart failure.[8] However, improvement of the patient's symptoms remains central in the indication for invasive AF management.[4] Thoracoscopic surgery for AF has been associated with high efficacy rates. It has been suggested that its higher efficacy goes at the cost of more procedural complications compared with catheter ablation, and therefore potentially negatively affects QoL.[9] However, prospective data on QoL in patients undergoing thoracoscopic surgery for AF are lacking.

The Atrial Fibrillation Ablation and Autonomic Modulation via Thoracoscopic Surgery (AFACT) study demonstrated no efficacy of additional ganglion plexus (GP) ablation in patients with advanced AF undergoing thoracoscopic AF surgery, but there was an increased incidence of complications compared with the control group.[10] The aim of this prespecified substudy of AFACT was to determine the change in QoL after thoracoscopic AF ablation in relation to additional GP ablation, freedom of AF recurrence, and procedural complications.

MATERIALS AND METHODS

Study Design

The AFACT study compared the efficacy and safety of additional GP ablation with no additional GP ablation in patients with advanced paroxysmal or persistent AF undergoing thoracoscopic surgery for AF. The study was registered at clinicaltrials.gov (NCT01091389) and approved by the institutional review board of the Academic Medical Center. All patients provided written informed consent. The methods and main clinical findings have been published.[10,11] In brief, the study included patients with advanced AF, that is, mostly persistent AF, with enlarged left atria or previously failed catheter ablation, refractory or intolerant to at least 1 AAD, undergoing thoracoscopic surgical ablation. All patients (n = 240) were subjected to thoracoscopic pulmonary vein isolation (≥6 RF applications to the pulmonary vein antrum with the AtriCure Isolator Synergy bipolar RF ablation clamp; AtriCure Inc, Mason, Ohio). Video 1 provides a summary of the surgical procedure. In patients with persistent AF, additional left atrial lines were ablated conforming to the Dallas lesion set.[12] Patients were randomized to additional ablation of the 4 major ganglionic plexi and Marshall's ligament (n = 117) or no additional GP ablation (control group, n = 123).

Clinical Follow-up

Patients were followed up every 3 months with electrocardiogram (ECG) and 24-hour Holter monitoring performed at every follow-up visit for 1 year. Patients were encouraged to obtain additional rhythm recording when symptomatic. AF recurrences were defined as any episode of AF, atrial tachycardia, or atrial flutter documented on ECG or 24-hour Holter lasting more than 30 seconds. A blanking period of 3 months after the procedure was instituted during which AF recurrences were not considered a clinical end point.[8] All AADs were discontinued 3 months after the procedure, unless the patient continued to have AF. Procedural complications were defined as major when causing (prolongation of) hospital admission within 30 days.[10] Of those, events were defined as irreversible when injury was permanent (ie, pacemaker implantation, stroke, or phrenic paralysis) or when the thoracoscopic procedure could not be completed.[10]

Health-Related Quality of Life Form

Assessment of change in QoL was a prespecified analysis of the AFACT study, and Short Form 36 (SF-36) QoL questionnaires were filled out before randomization and at 6 and 12 months follow-up. The SF-36 QoL questionnaire is a validated generic questionnaire to measure physical and mental health in individuals. It consists of 36 questions, grouped into 8 scales: physical functioning, role physical, bodily pain (BP), social functioning, mental health, role emotional, vitality, and general health perception. The 8 scales are summarized in 2 dimensions, Physical Component Summary (PCS) and Mental Component Summary (MCS), normalized to an overall population mean ± standard deviation of 50 ± 10. The 8 scales and 2 summary dimensions are transformed to a scale from 0 to 100, where 100 is the best possible health, as described by Ware and colleagues.[13] The scores from a dataset displaying the QoL in the general Dutch population were used as a reference.[14]