

ASPECTS OF INTRAOPERATIVE ABLATION FOR ATRIAL FIBRILLATION

Akademisk avhandling

som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien vid Göteborgs universitet kommer att offentligen försvaras i Sahlgrens Aula, Sahlgrenska Universitetssjukhuset, Göteborg, fredagen 18 september 2009, kl. 13.00

av

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Avhandlingen baseras på följande delarbeten:

- I. Johansson B, Houltz B, Berglin E, Brandrup-Wognsen G, Karlsson T, Edvardsson N
Short-term sinus rhythm predicts long-term sinus rhythm and clinical improvement after intraoperative ablation of atrial fibrillation.
Europace 2008;10:610-617
- II. Blomström Lundqvist C, Johansson B, Berglin E, Nilsson L, Jensen S, Thelin S, Holmgren A, Edvardsson N, Källner G, Blomström P
A randomized double-blind study of epicardial left atrial cryoablation for permanent atrial fibrillation in patients undergoing mitral valve surgery: the SWEDish Multicentre Atrial Fibrillation study (SWEDMAF).
Eur Heart J 2007;28:2902-2908
- III. Johansson B, Houltz B, Edvardsson N, Scherstén H, Karlsson T, Wandt B, Berglin E
Effects on echocardiographic measures in relation to rhythm before and after intraoperative epicardial cryoablation for atrial fibrillation.
Submitted
- IV. Houltz B, Johansson B, Berglin E, Karlsson T, Edvardsson N, Wandt B.
Left ventricular diastolic function and right atrial size are important rhythm outcome predictors after intraoperative ablation for atrial fibrillation.
Submitted



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Abstract

Background: Increasing knowledge about mechanisms that trigger and maintain atrial fibrillation (AF) has influenced the possibilities for treatment and even cure of AF. The surgical Cox Maze III procedure is still the gold standard for the curative treatment of AF. The development of new technologies has made it possible to mimic most of the Cox Maze III procedure, including isolation of the pulmonary veins, by means of intraoperative ablation using an epicardial lesion set.

Aim: To assess the efficacy of intraoperative epicardial ablation in patients with a primary indication for cardiac surgery and with documented AF. To assess whether sinus rhythm (SR) after surgery is of clinical benefit to the patient. To identify preoperative factors that can help to predict SR postoperatively.

Method: Intraoperative ablation was performed with radiofrequency energy (RF) in papers I and IV or with cryo energy in II, III and IV. The lesion set was identical in all studies. The study design was randomization in paper II and with age and gender matched controls in papers I and III. Assessment of quality of life (QoL) and symptoms at long-term follow-up was made in paper I and of echocardiographic effects in relation to rhythm before and after coronary artery by-pass grafting (CABG) in paper III. The effects of intraoperative ablation and mitral valve surgery (MVS) were studied in paper II. In paper IV an assessment of potential preoperative echocardiographic predictors for SR after surgery was made in patients from papers I and III.

Results: In papers I, II and III concomitant intraoperative epicardial ablation with RF or cryo energy was significantly more effective in restoring SR than CABG or valve surgery alone. At 32 ± 11 months after heart surgery and intraoperative RF ablation, patients in SR had better QoL and fewer symptoms than patients with AF. In paper III atrial and ventricular function was slightly decreased 22 ± 6 months postoperatively, but still within or close to reference limits for patients in SR before and after surgery. There was a continued deterioration of echocardiographic variables in patients with AF pre- and postoperatively. Preoperative right atrial size and left ventricular diastolic function predicted long-term rhythm outcome (IV). SR at three months was a strong predictor of long-term SR (I and III). Independent preoperative predictors for SR at follow-up were paroxysmal/persistent AF (I), low BMI (I), short duration of AF (II), no coronary artery disease (II), SR before surgery (III) and a small left atrial area (III).

Conclusions: Concomitant intraoperative ablation was significantly more effective than CABG or valve surgery alone in restoring and maintaining SR. Patients with SR at long-term follow-up had better QoL and fewer symptoms. Preoperative predictors for SR postoperatively were right atrial size and left ventricular diastolic function. SR at three months was a strong predictor of long-term SR. The findings speak in favour of offering intraoperative ablation as a concomitant procedure to patients scheduled for CABG or valve surgery and with documented AF.

Key words: atrial fibrillation, radiofrequency, cryo, epicardial, intraoperative ablation, quality of life, atrial function, predictors of rhythm