Surgical treatment of atrial fibrillation with new liquid nitrogen cryotherapy - clinical experience, mid- and long-term results

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Background: Surgical treatment of atrial fibrillation (AF) evolves to less invasive, safer and technically easier procedures mostly due to the electrophysiological studies, technological progress and creativeness in ablation systems construction. We present the first clinical experience and mid- and long-term results of AF treatment with new liquid nitrogen cryotherepy device for endocardial application.

Material and methods: Between January 2002 and September 2004 26 patients with AF underwent left-sided endocardial cryoaablation with new liquid nitrogen cryotherepy device. Group of patients included 17 (65%) male, 9 (35%) female at average age of 61,1 ± 9,2 years. 11 (42%) patients suffered from paroxysmal AF, 15 (58%) patients were in chronic AF. The mean duration of AF was 5 ± 9,2 years. Average left atrium (LA) diameter was 51 (± 7) mm. Cryoablation was concomitant to mitral valve surgery in 18 (71%) patients, mitral valve replacement (MVR) and coronary artery bypass grafting (CABG) in 2 (8%) patients, mitral and aortic valve replacement (MVR and AVR) in 1 (3%) patient, MVR and AVR with CABG in 1 (3%) patient, MVR with atrial septal defect closure in 1 (3%) patient, MVR and tricuspid valve plasty in 1 (3%) patient, MVR and aortic root replacement in 1 (3%) patient, myxoma surgery in 1 (3%) patient. Follow-up was prospectively collected after 3,6,12 and 24 months after surgery - including 24-hours Holter ECG and echocardiography.

Results: At discharge 17 (73%) patients were in sinus rhythm (SR). At 3 and 6 month-long follow-up SR was found in 70% (14/20) and 12/17 respectively). After one year 77% (6/9) patients were in SR. In 24 month-long follow-up SR was found in 3/4 (75%) patients. None of patients required pacemaker implantation. We found significant negative correlation between LA diameter and early effectiveness of ablation (r=-0,61; p<0,05). Conclusion: As indicated by our small cohort of patients first clinical experience with surgical treatment of AF with use of new liquid nitrogen cryothyrepy device shows its safety and feasibility. Results of mid- and long-term follow-up are encouraging. Further clincial use of the device with precise follow-up is in progress.

Risk factors of supraventricular arrhythmias before and after surgical closure of atrial septal defect (ASD t.2) in adults

Methods: 98 patients (55F, 23M, mean age 43,8 ± 11 years) who were operated on isolated ASD t.2 in Cardiosugery Department in Medical University in Lodz between 1990-2001 were included. Mean age in the time of surgery was 37±12 years. Follow-up studies were performed 2-11 years after operation; average 6,6 ± 3,1 years. Patients were divided into two groups according to presence of AF/AFl before and after surgery. Group AF (+) consisted of 34 pts. (34,7%) and group AF (-) of 64 pts. (65,3%). In all pts. echocardiographic test, electrocardiogram (ECG) at rest and P-wave signal averaging potential in SAECG were performed. In echocardiography we assessed: value of pulmonary artery systolic pressure (PASP), left and right atrial (LA, RA) diameters (M-mode and 2-D presentation), diameter of right ventricle (RV), value of tricuspidal insufficiency (TI), value of mitral insufficiency (IM). In ECG we assessed P wave duration.

Results: AF was observed in 27 pts (27,5%) before surgery and in 34 (34,7%) pts. after surgery. In 5 pts. (5,1%) AF occurred as a continuous form of arrhythmia, in 29 pts. (29,6%) a paroxysmal form. Considering all potential risk factors which may predispose to occurrence of AF incidence after operation we included age before and after operation, value of PASP, LA, RA and RV diameters, value of TI and IM, P wave duration in ECG, PWD in SAECG in univariate and next in multivariate analysis in logistic regression model. Results of multivariate analysis are illustrated in Table 1. According to obtained results we observed that PWD in SAECG is characterized by high sensitivity (93,1%) and specificity (85,9%) at positive predictive value (PPV = 75%) and negative predictive value (NPV = 96,5%).

Conclusions: The occurrence of paroxysmal AF and potential risk factors in multivariate logistic regression model.

Intraoperative radiofrequency ablation to treat permanent atrial fibrillation in patients undergoing open heart surgery

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Surgical treatment of atrial fibrillation (AF) can effectively restore sinus-rhythm (SR) in patients undergoing open heart surgery. But the original cut-and-suture technique bears surgical difficulties and is time consuming. Can intraoperatively induced linear radiofrequency ablation lines cure long-lasting AF in patients undergoing open heart surgery?

Methods: 161 patients (mean ejection fraction 57±14%) with permanent AF (>1 failed conversion, AF duration 7±7years) undergoing different open heart surgical procedures (mitral valve repair 27, mitral valve replacement 21, combined procedures 13) plus intraoperative cut-and-suture technique bears surgical difficulties and is time consuming. Can intraoperatively induced linear radiofrequency ablation lines cure long-lasting AF in patients undergoing open heart surgery?...