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Evaluation of cryoablation procedures in treatment of atrial fibrillation from a 3-year experience in a single heart center

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Objectives: Cryoablation is evermore applied for interventional treatment of paroxysmal (PAAF) or persistent atrial fibrillation (PEAF). In the cardiac surgery, this procedure is often combined with CABG and valve operations. Three different methods are feasible in this sense with respect to practicing extents and mechanisms such as lone left atrial cryoablation, Cox-Maze IV and III in our heart center.

Methods: 415 patients (68±0.8years, male 68.2%) with predisposed atrial fibrillation who initially required either coronary or valve operations were enrolled and divided into 3 matched groups according to deployed procedures: CryoLA-group (cryoablation of LA, n=94); Cox-Maze-IV-group (n=93) and Cox-Maze-III-group (n=8). All patients received closure of the LAA and regularly underwent three-year ambulant follow-up assessments (3, 6, 9, 12, 18, 24, 30 and 36 months). Burdens of atrial fibrillation were assessed directly by means of cardiac monitor (Reveal XT, Medtronic) or of 3-day Holter electrocardiogram. Herewith, attacks frequencies of AF and their circadian patterns were systemically analyzed. Furthermore, anticoagulants and regular anti-arrhythmic medications were evaluated and the last were listed in terms of anti-rate and anti-rhythm regimens.

Results: Concerning PAAF treatment, COX MAZE IV procedure provided therapeutically acceptable effect as lone LA cryoablation did (5.25±5.25% vs. 10.39±9.96% AF-burden, p>0.05). Interestingly, Cox MAZE III method presented a better short-term effect in the PEAF therapy in comparison to lone cryoablation of LA and Cox MAZE IV (0.25±0.23% vs. 15.31±5.99% and 9.10±3.73% AF-burden within the first year, p<0.05). But this therapeutic advantage went lost in the further course of follow-ups (26.65±24.50% vs. 8.33±8.06% and 15.73±5.88% in 3rd follow-up year). In this way, lone LA-cryoablation established its antiarrhythmic efficacy and 69.5% patients were released from the Vit-K-antagonists, while Cox MAZE IV liberated 67.2% patients from continuous anticoagulant medication. The AF-recurrences mostly performed such attacks property as less than 60 min duration for all 3 procedures (p>0.05). In sense of the circadian distribution of the recurrence attacks, weighted by ongoing follow-ups, lone LA cryoablation achieved and stabilized the antiarrhythmic effects over time, which was especially observed in treatment of PEAF, while Cox MAZE IV and III had their antiarrhythmic effects weakened progressively. This phenomenon was likewise evaluable in the therapy of circadian rhythm of reverting AF-attacks. Furthermore, the strategy of rate control was much more often applied to support and maintain therapeutic successes obtained than the one of rhythm control.

Conclusion: Derived from experiences in our heart center, lone LA cryoablation presented equivalent effects in the treatment of AF in comparison to COX Maze IV and III procedures. These therapeutic successes were especially investigatable in the patients suffering from PEAF. Additional supportive strategies such as rate and/or rhythm control should be initialized and implemented to improve the therapeutic effects of the cryoablations according to appropriate criteria.

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