

Minimally invasive epicardial ablation for atrial fibrillation

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Chapter 11

Summary

Minimally invasive epicardial ablation of lone atrial fibrillation in pediatric patient.

A case of epicardial surgical ablation of drug-refractory lone atrial fibrillation in a pediatric patient was presented. It was demonstrated that it is feasible and reliable even in children who may pose incremental technical challenges.

Long-term results of ablation for isolated atrial fibrillation through a right mini-thoracotomy: toward a rational revision of treatment protocols.

A total of 104 patients with drug-refractory isolated atrial fibrillation underwent minimally invasive surgical ablation and were followed up for an average of 17 months. The procedure was confirmed to be safe (1 case of procedure-related morbidity, 0 operative deaths) and effective (89% overall freedom from recurrent arrhythmia throughout the follow-up period. Moreover, health-related quality of life was confirmed to be improved at the end of the follow-up period relative to the baselines measured.

Increased plasma homocysteine predicts arrhythmia recurrence after minimally invasive epicardial ablation for nonvalvular atrial fibrillation.

We obtained peripheral blood samples to determine homocysteine levels of 104 patients during the follow-up period after arrhythmia surgery. Elevated circulating homocysteine levels, persistent atrial fibrillation, and increased left atrial dimension independently predicted the recurrence of atrial fibrillation during the follow-up period. In particular, a cutoff value for elevated

homocysteine levels (16 mmol/L) yielded a good diagnostic performance in predicting the recurrence of atrial fibrillation.

Mid-term performance of bipolar radiofrequency ablation for isolated atrial fibrillation through a right mini-thoracotomy.

A total of 126 consecutive patients with drug-refractory isolated atrial fibrillation underwent bipolar minimally invasive surgical isolation of the pulmonary veins with a mean follow-up period of 23.5 months. Although the overall freedom from recurrent arrhythmia was 78.8%, freedom from antiarrhythmic drugs was very low due to the gap observed in medication management. As such, only quantitative and not qualitative health outcomes significantly improved during the follow-up period.

A modified surgical ablation line for atrial fibrillation: the Bachmann line.

We described how to perform minimally invasive epicardial pulmonary vein isolation along with the isolation of Bachmann's bundle. Adding the surgical ablation line of Bachmann's bundle is a feasible, fast, and easy procedure that may contribute to the reduction of atrial fibrillation recurrence.

Targeting Bachmann's bundle in hybrid ablation for long-standing persistent atrial fibrillation: a proof-of-concept study.

In a two-arm non-randomized study, consecutive long-standing persistent atrial fibrillation patients undergoing epicardial isolation of pulmonary veins with left atrial posterior wall (box lesion) with (30 patients) and without additional Bachmann's bundle ablation (30 patients) were enrolled in the study. All patients underwent an endocardial procedure within six weeks post-surgery to

assess potential lesion gaps and any additional atrial substrate modifications. Two-staged hybrid ablation was successfully performed in all patients. One-year freedom from atrial arrhythmia recurrence rates was 96.6% in the Bachmann group and 76.6% in the non-Bachmann group ($p=0.025$). Upon completion of the procedure, 30 (100%) and 17 (56%) patients had spontaneous cardioversion in the Bachmann and non-Bachmann groups, respectively ($p<0.001$).

The fate of patients after failed epicardial ablation of atrial fibrillation

549 surgical atrial fibrillation ablation procedures were performed through a right mini-thoracotomy. With a mean follow-up period of 77 months, the rate of atrial fibrillation recurrence observed was 20.7%. Upon multivariate analysis, impaired left ventricular ejection fraction, worsening of EHRA symptom class, and cognitive decline or depression during the follow-up period were significantly associated with atrial fibrillation recurrence.

Catheter, surgical, or hybrid procedure: what is the future for atrial fibrillation ablation?

A total of 609 surgical atrial fibrillation ablation procedures through a right mini-thoracotomy were performed at our institution. A radiofrequency device was used from 2008 to 2011 while a bipolar radiofrequency device was used from 2011 to 2020. In addition, between September 2016 and April 2017, 60 patients underwent endocardial completion of epicardial linear ablation. In 30 of these patients, surgical isolation of the Bachmann's bundle was performed. After a mean follow-up period of 74 months, 122 (20%) patients developed recurrent atrial fibrillation, including 19.9% in whom a unipolar radiofrequency device was used, 21% in whom a bipolar radiofrequency device was used, 23% who had undergone a hybrid procedure without Bachmann's bundle ablation, and 3.3%

who had undergone a hybrid procedure with Bachmann's bundle ablation. The placement of adjunctive linear lesions in the setting of a hybrid procedure can be more effective in reducing the risk of atrial fibrillation recurrence than isolated surgical ablation or hybrid ablation without the addition of further linear lesions.