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Original research article – Special issue: Surgery treatment of atrial fibrillation

## Reality of surgical treatment of atrial fibrillation in the Czech Republic – Data from the National Register of Cardiac Surgery (2010–2015)

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## ABSTRACT

*Introduction:* Surgical ablation is an established treatment for atrial fibrillation (AF) in certain patients indicated for cardiac surgery. However, several strategies and approaches exist at different centers and no recent reports exist about current trends in AF treatment in the Czech Republic. We examined the national trends of concomitant and stand-alone surgical ablation of AF.

*Methods:* Data from the National Register of Cardiac Surgery and from a special questionnaire, created especially for this analysis, were used for evaluation of trends in the rate of concomitant surgical ablations in AF patients, rates of different concomitant procedures, and to analysis those factors that surgeons routinely used to reject AF treatment during cardiac surgery. Data about stand-alone AF surgery were also gathered and analyzed. The study period lasted from 2010–2015.

*Results:* Overall, 54% of cardiac surgery patients with history of AF received a concomitant surgical ablation procedure; this percentage declined slightly over the study period from 59% in 2010 to 51% in 2015. Concomitant ablation was most often performed on mitral valve patients (71%) and least often during isolated coronary revascularization (40%). In a multivariate analysis, age, history of myocardial infarction, history of cardiac surgery, renal failure, severe systolic dysfunction of the left ventricle (i.e., ejection fraction  $\leq 30\%$ ), and preoperative hemodynamic instability were identified as strongest independent factors that causes surgeons to reject AF treatment during a non-AF cardiac surgery. Stand-alone AF surgery was performed in 9 (75%) Czech centers during the study period with a total of 132 procedures; this method has been abandoned by most centers, while several have switched to a hybrid ablation (HA) strategy. Hybrid ablation programs were ongoing in 5 centers in 2016, the overall number of procedures through the end of 2015 was 144.

*Conclusions:* The prevalence of surgical AF treatment in cardiac surgery patients has been slightly decreasing, and in almost half of the patients AF was left untreated. Stand-alone AF surgery has been nearly abandoned, while hybrid treatment has slowly expanded in Czech centers.

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**Introduction**

Atrial fibrillation (AF) is an important socio-economic problem facing modern health care, especially in developed countries. The estimated AF prevalence is approximately 3% in those 20 years of age or older, with an even greater prevalence in patients with comorbidities such as heart failure, hypertension, diabetes mellitus, obesity, chronic kidney disease, coronary artery disease, and valvular heart disease [1]. This means that we face a higher AF prevalence in cardiac surgery patients. Surgical treatment of AF has been around for over three decades and has gone through a huge development in techniques, devices, and strategies [2]. It is now recommended, as a procedure concomitant with other cardiac surgery, to all AF patients with symptoms attributable to AF, if there is a reasonable chance for success [1]. It has been repeatedly shown that the addition of AF surgical ablation (SA) does not increase the risk of the procedure [3,4]. Nonetheless, debates about the most effective SA strategy for AF patients continues. Separate procedures have been developed for patients with stand-alone AF [5]. Currently, we are seeing increased use of epicardial, off-pump ablations as well as hybrid ablations (i.e., combination of epicardial surgical and endocardial catheter ablation) in the treatment of AF [6].

The history of SA for AF in the Czech Republic goes back more than 10 years. In 2007, Neuzil et al. reported that by 2005, all centers in the Czech Republic were performing SAs. They also reported that by the end of 2005, over 1800 surgical ablations had been carried out (although, only one was stand-alone AF surgery). In the same report, Neuzil noted that the most commonly used energy for lesion creation was cryoenergy [7].

The purpose of this article is to describe the current state of medicine regarding SA of AF in the Czech Republic as well as trends over the last 6 years. Also, and for the first time, a summary of the current state of implementation of isolated surgical and hybrid procedures into practice is reported.

**Material and methods***Data source*

Two sources of data were used for this study, (1) the Czech National register and (2) a questionnaire, developed especially for this study. The National Register of Cardiac Surgery (NR) is a voluntary database established in 1994. It was founded mainly to gather information about the number of cardiac

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