Preface

Dear colleagues and readers,

It is a great honor for us to serve as Guest Editors for the current issue of the *Annals of Cardiothoracic Surgery* (*ACS*). This issue focuses on treatment of atrial fibrillation (AF) as concomitant or stand-alone procedures. In 1987, Dr. James Cox, in collaboration with cardiologist John Boineau and physiologist Richard Schuessler, pioneered an open-heart surgical procedure to treat AF. More than 25 years later, the Maze procedure is still regarded as the standard procedure for concomitant AF. During these years, it has been modified to simplify the operation, culminating in the Cox-Maze IV technique and other less elaborated lesion sets. Key components of the Maze procedure are isolation of the pulmonary veins and excision of the left atrial appendage (LAA). These features are maintained in most of the operations designed to treat AF. New ablation tools have been marketed to replace the "cut-and-sew", with catheters being part of the most innovative, new technologies in cardiac surgery within the last few years. Despite the growing data in favor of concomitant treatment of AF, a recent publication from the Society of Thoracic Surgeons Adult Cardiac Surgery Database [2005-2010] showed an important under-treatment of AF in non-mitral valve patients. Therefore, many open questions remain to be solved and challenges to be answered.

Since Haïssaguerre and colleagues published in 1998 that paroxysmal AF often originates from ectopic beats in the pulmonary veins, their isolation became the cornerstone of most ablation strategies in percutaneous and surgical treatment of stand-alone AF. The ability to create transmural lesions on the beating heart through a less-invasive, thoracoscopic procedure has led to an increasing acceptance of surgical treatment of stand-alone AF in the cardiac community. Better understanding and improved collaboration between the electrophysiologist and the cardiac surgeon has opened the way for hybrid procedures.

In the current issue, more than 20 manuscripts will cover a wide range of important topics in the treatment of AF. The Keynote Lecture will describe the indications and the surgical options for treatment of concomitant and lone AF. The pathophysiology of AF, energy sources, lesion sets and minimally invasive hybrid procedures will be discussed. A brief report by Dr. Steven Hunter covers the definition of success in AF ablation surgery. The Collaborative Research (CORE) Group from Sydney, Australia has done a systematic review and meta-analysis of surgical ablation for AF during mitral valve surgery and a meta-analysis of surgical ablation versus catheter ablation for AF.

Dr. James L. Cox will give an overview of surgery for AF. Dr. Damiano and his team will compare the stand-alone Cox-Maze IV procedure to the concomitant Cox-Maze IV and mitral valve procedure for AF. Linda Henry and Niv Ad will discuss the performance of the Cox-Maze procedure in a large surgical ablation center. These authors will help us with their comprehensive approach to educate and train surgeons so that the results and safety can improve, and the percent of patients who are offered and undergo an AF ablative procedure will increase from the current figure of only 38%.

Occlusion of the LAA is a promising approach to stroke prevention in AF. However, to date evidence of its efficacy and safety is currently lacking. Dr. Richard Whitlock explains the rationale and design of the Left Atrial Appendage Occlusion Study (LAAOS) III, a definitive LAA occlusion trial in cardiac surgical patients with AF. Dr. Sacha Salzberg shows that the heart-team approach will enable a tailored therapy in the setting of an invasive rhythm control strategy that can lead to better outcomes. He makes a point that in addition to stroke prevention, electrical isolation can be important since recent reports suggest that the LAA could be a source of AF triggers in up to 30 percent of patients in redo catheter ablations.

Dr. Robert Altman, from the group of Dr. Andrea Natale, describes the management of refractory AF post surgical ablation. The mechanisms of these arrhythmias are variable but frequently involve gaps, recovered conduction or incompletely ablated tissue along ablation lines created at the time of surgery. The authors conclude that catheter ablation is safe and effective for the diagnosis and treatment of persistent or late recurring arrhythmias after surgical ablation for AF.

Dr. Randall K. Wolf describes his procedure for treatment of lone AF: minimally invasive pulmonary vein isolation, partial cardiac denervation and excision of the LAA. He also reviews 157 patients who are now up to nine years out from the Wolf procedure.

Dr. Laurent Pison describes a combined percutaneous endocardial and thoracoscopic epicardial procedure for stand-alone AF as the best of two worlds. Effectiveness and safety of simultaneous hybrid thoracoscopic and endocardial catheter ablation are discussed and comments on breakthroughs in hybrid management of AF are given.

While reverse remodeling has been demonstrated to occur after catheter ablation irrespective of the paroxysmal or persistent nature of AF, little is known about left atrial reverse remodeling and atrial function in response to a successful surgical AF ablation. Dr. Sandro Gelsomino shows that there is indeed an improvement of left atrial function and left atrial reverse remodeling after surgical treatment of AF.

We are pleased to have three experts in the field of AF treatment participate in the video section "Masters of Cardiothoracic Surgery". Dr. Ralph J. Damiano Jr presents "How I do it: minimally invasive Cox-Maze IV procedure". Dr. Randall K. Wolf shows a very educational video of the Wolf Minimaze. Dr. Mark La Meir demonstrates epicardial treatment of concomitant AF in non-mitral valve surgery as an add-on video to his paper on the problem of concomitant AF in non-mitral valve surgery.

Finally, we would like to take a moment to thank all contributing experts in the field of AF for their effort in putting together this special issue. Without their help, this would not have been possible. We would also like to thank the team of the *ACS*, headed by Prof. Tristan D. Yan, for their everlasting enthusiasm.

It is our sincere hope that this issue will be of interest to the readers of the *ACS* and serve as an educational tool to facilitate decision making when confronted with a patient with AF. Enjoy reading this issue in sinus rhythm!

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