Preface

It is a great honour for me to serve as the Guest Editor of this edition of the ***Annals of Cardiothoracic Surgery*** (ACS). ACS is a new multimedia publication with bimonthly installments that focus on a particular topic in cardiothoracic surgery, with a format that puts reader education as its primary goal. The first ACS edition was a tremendous success and future issues promise to be just as informative. A review of the ACS website (www.annalscts.com) also reveals a very professional and well-structured layout that allows the reader to view detailed surgical illustrations and videos, review recent literature on the topic, learn the opinions of world experts, and ascertain the level of evidence supporting the procedure in question. My sincere congratulations go out to Tristan Yan and the rest of the editorial team in producing an outstanding educational tool.

The focus of the current issue is transcutaneous aortic valve implantation (TAVI), in particular transapical TAVI. After Cribier pioneered the transfemoral approach to TAVI in 2002, our center was the first to perform a transapical TAVI in man in December 2004. The first implantation was the result of groundbreaking work performed by Thomas Walther, Todd Dewey, Michael Mack, and Fred Mohr. Since then we have witnessed an explosion in research, financial investment, and clinical experience with this exciting new technology. The two TAVI devices that were first to receive CE Mark approval in Europe, the Edwards Sapien and Medtronic CoreValve systems, have both been implanted in more than 25,000 patients to date. Two other devices have been recently approved for transapical delivery in Europe, and a host of other transfemoral and transapical valves are in the clinical and preclinical stage of development. The number of TAVI procedures performed has exploded around the world and in Germany in particular, where they now represent one-third of all isolated aortic valve operations. One could argue that we are witnessing the golden age of TAVI and that the sky is the limit for this revolutionary technology.

Before we become too giddy with excitement, however, much needs to be learned about TAVI in the coming years. With clinical experience of over 5 years with the original devices to date, the next decade will represent a critical juncture for TAVI. Valve durability will receive increasing scrutiny and the long-term effects of leaflet crimping, if any, will become evident. In addition, longer term information on the negative effects of residual aortic regurgitation, as recently demonstrated in the two-year PARTNER study results, will become available from other investigators. Methods of minimizing periprocedural stroke and pacemaker implantation will also be a major focus in the years to come. These issues will carry particular importance if we are to ever consider performing TAVI in younger or lower risk patients.

Improved patient selection and better definition of suitable subgroups will also be a critical issue for TAVI research in the next decade. The weaknesses of current preoperative risk scoring systems are well known and other risk assessment tools will need to be devised. At least two clinical trials have been recently initiated in order to assess the performance of TAVI in moderate risk patients. Although preliminary data from the German national registry argues against the use of TAVI in lower risk patients, randomized trial data will be the only method of definitively determining suitability in these patient populations. Finally, the issue of costs will become increasingly important, particularly given the challenging economic environment that is being predicted in many areas around the globe. Reimbursement will need to be particularly scrutinized, as there is already evidence that a liberal reimbursement policy leads to questionable clinical decision-making. We will also need to develop TAVI recommendations based on quality of life outcomes, particularly for elderly patients. It is obvious that the use of expensive technology in patients who are unable to achieve a clinical benefit is not only morally unacceptable, but also fiscally irresponsible. All of the above issues will be critical in determining whether the current TAVI explosion continues into the next decade.

With the help of input from many international renowned experts, the current edition of ACS will provide the reader with a comprehensive overview of the current state of TAVI clinical practice and will help place some of the abovementioned issues into context. The next five years promises to be a very exciting phase for TAVI as it becomes adopted in a larger number of centers around the world. The recent FDA approval in the U.S. represents a particularly important development, as our American colleagues apply their world-renowned analytical skills to this new therapy.

As a final word I would like to say that I remain convinced that conventional aortic valve replacement will continue to play a predominant role in the future, particularly in patients who are not at high surgical risk. As a cardiac surgeon I firmly believe that the results of conventional surgery are too good in non-high risk patients, and that the bar has been set too high for TAVI to achieve. However, only time and properly conducted clinical investigation will tell if my conviction is true.

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