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Dr Santarpino discloses a financial relationship with Sorin Group Italia.

References

1. Liakopoulos OJ, Gerfer S, Weider S, et al. Direct comparison of the Edwards Intuity Elite and Sorin Perceval S rapid deployment aortic valves. Ann Thorac Surg 2018;105:108–14.
2. Fischlein T, Gersak B, Pfeiffer S. How to prevent a pacemaker implantation after sutureless bioprosthesis. J Thorac Cardiovasc Surg 2016;152:635–6.
3. Fischlein T, Dell'Aquila AM, Santarpino G. Technical changes in the implant of sutureless aortic valves: the sense of being pioneers. J Thorac Cardiovasc Surg 2016;152:288.

Reply
To the Editor:

We thank Santarpino and colleagues [1] for their interesting comments and would like to address the concerns that have been raised regarding our report [2].

Firstly, as clearly indicated in our limitations section, the presented results were based on a small and retrospectively analyzed patient cohort. Consequently, an adequate propensity score matching or regression analysis would have been futile at this stage and largely limited by the small sample size with insufficient power, especially due to the small Perceval (Sorin Biomedica Cardio Srl, Sallugia, Italy) group.

Secondly, the need for permanent pacemaker implantation was 9.6% in our entire rapid deployment valves cohort, with a 12.8% rate in our early Perceval patient series. Please consider that this rate is closely mirrored by the prospective, multicenter Cavalier trial, where a comparable overall pacemaker implantation rate of 11.6% in a total of 658 patients was reported after Perceval implantation in experienced European centers [3]. Being a part of the Nuremberg group, the primary author of the present letter participated in this trial and coauthored the Cavalier trial report [3] and, thus, should be aware of these results.

Although identifying risk factors for postprocedural pacemaker implantation was way beyond the scope of our study, the Cavalier investigators discuss potential risk factors, including a high-risk patient profile and preexisting cardiac rhythm disturbances [3]. Thus, as highlighted in our Comment section, the high-risk profile of our patient cohort, coupled with our general institutional policy to early indicate pacemaker implantation after operations in patients with persistent cardiac rhythm disorders, may have driven the rate of pacemaker implantation in our series.

Finally, we can appease the authors of the letter that the need for a pacemaker implantation after Perceval implantation has constantly decreased in our institution (3.2% in the last 18 months) due to our growing experience and appropriate patient selection for this type of rapid deployment valve.

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References

1. Santarpino G, Gregorini R, Dell'Aquila AM. Comparison of unmatched pairs and possible impact on result interpretation (letter). Ann Thorac Surg 2018;106:311–2.
2. Liakopoulos OJ, Gerfer S, Weider S, et al. Direct comparison of the Edwards Intuity Elite and Sorin Perceval S rapid deployment aortic valves. Ann Thorac Surg 2018;105:108–14.
3. Laborde F, Fischlein T, Hakim-Meibodi K, et al. Clinical and haemodynamic outcomes in 658 patients receiving the perceval sutureless aortic valve: early results from a prospective European multicentre study (the Cavalier trial). Eur J Cardiothorac Surg 2016;49:978–86.

Ischemic Mitral Regurgitation Treatments After Mitral Annuloplasty

To the Editor:

We read with interest the article by Bouma and associates [1] entitled "Preoperative three-dimensional valve analysis predicts recurrent ischemic mitral regurgitation after mitral annuloplasty" published in *The Annals*. Ischemic mitral regurgitation is common, and its presence strongly affects prognosis. Even a mild degree of ischemic mitral regurgitation adversely affects survival, with a strongly graded relationship between severity and reduced survival [2]. As noted in this study, mitral valve repair with undersized ring annuloplasty is currently the preferred treatment strategy for ischemic mitral regurgitation [3, 4]. Patients' characteristics were analyzed in their Table 1. The ring types used in the study were left to the surgeon's discretion and the ring type selection reason is not mentioned. We have some doubts about used ring types for mitral annulus. What were the selection criteria for rigid, semirigid, or flexible?

Both coronary artery bypass operation and mitral annuloplasty have recovery effects on cardiac functions [5]. The reason for recovery in patients with nonrecurrent ischemic mitral regurgitation during the postoperative period is not mentioned in the methodology as being because of coronary artery bypass or an undersized ring annuloplasty effect.

Although undersized ring annuloplasty is mentioned as a recommended repair technique for ischemic mitral regurgitation, outcomes are not as good as expected. We should work on new techniques that should achieve complete coaptation of the mitral leaflet free edge in the systolic phase. Therefore, we cannot argue that an acceptable repair procedure has been performed unless a complete coaptation is achieved in the mitral valve. The intraoperative coaptation depth should have an impact as a prognostic factor in postoperative ischemic mitral regurgitation patient recruitment, and it could be useful to use it in the study.

MISCELLANEOUS

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References

1. Bouma W, Lai EK, Levack MM, et al. Preoperative three-dimensional valve analysis predicts recurrent ischemic mitral regurgitation after mitral annuloplasty. Ann Thorac Surg 2016;101:567–75.
2. Trichon BH, Felker GM, Shaw LK, Cabell CH, O'Conner CM. Relation of frequency and severity of mitral regurgitation to survival among patients with left ventricular systolic dysfunction and heart failure. Am J Cardiol 2003;91:538–43.
3. Grossi EA, Goldberg JD, LaPietra A, et al. Ischemic mitral valve reconstruction and replacement: comparison of long-term survival and complications. J Thorac Cardiovasc Surg 2001;122:1107–24.
4. Nishimura RA, Otto CM, Bonow RO, et al. 2014 AHA/ACC guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association task force on practice guidelines. Circulation 2014;129:e521–643.
5. Castleberry AW, Williams JB, Daneshmand MA, et al. Surgical revascularization is associated with maximal survival in patients with ischemic mitral regurgitation: a 20-year experience. Circulation 2014;129:2547–56.

Reply

To the Editor:

We appreciate the interest expressed by Dr Bademci and colleagues [1] and their careful reading of our article [2]. Dr Bademci and colleagues address two important issues in the current discussion on surgical treatment of ischemic mitral regurgitation (IMR): annuloplasty ring type and concomitant coronary artery bypass grafting (CABG).

Annuloplasty ring type selection was left at the surgeon's discretion in our study, and this can be considered a limitation. We did, however, use a standardized approach of annular downsizing (two sizes down). In addition, Table 1 in our article [2] shows that there were no significant differences in ring types used among groups with and without recurrent IMR after repair. In the majority of patients (86%) a Profile 3D (Medtronic, Minneapolis, MN) or Physio II (Edwards Lifesciences, Irvine, CA) ring was used. Both ring types are saddle-shaped, semi-rigid, complete rings.

The relevance of ischemic mitral valve repair in the setting of CABG has been a major source of debate. Although this is a very interesting discussion, it was, however, not the focus of our study. In Table 1 of our article [2] we showed that the frequency of concomitant CABG (or any other concomitant procedure for that matter) did not differ significantly among groups.

Both annuloplasty ring type and frequency of concomitant CABG did not differ significantly among groups, and therefore both parameters cannot be considered predictors of repair failure on the basis of our study results.

Dr Bademci and colleagues argue that our mitral valve repairs may not be considered acceptable because we did not show in our paper whether complete coaptation was achieved. However, neither a clear definition of complete coaptation nor a reference to a clear definition is mentioned in their letter to the editor. Our paper described a three-dimensional geometric study to identify preoperative predictors of mitral valve repair failure. We do not see how intraoperative coaptation depth can aid in preoperative prediction of repair failure. However, in addition to preoperative parameters, we are in need of intraoperative parameters that can predict repair failure (or success). Coaptation length (which is probably what Dr Bademci and associates mean and which should not be confused with coaptation height or coaptation depth) may be an important intraoperative determinant of repair success, as shown by Braun and colleagues [3]. In fact, one of Carpentier's fundamental principles of repair (durability) is to create a large surface of coaptation. In addition, we should not forget that IMR is primarily caused by a disease of the left ventricle and not by a disease of the mitral valve itself. Therefore, in patients with IMR who are at high risk of annuloplasty failure, additional subvalvular repair techniques should be considered to optimize coaptation and durability of repair further.

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References

1. Bademci MS, Aldag M, Kocaaslan C, Oztekin A, Aydin E, Kestelli M. Ischemic mitral regurgitation treatments after mitral annuloplasty (letter). Ann Thorac Surg 2018;106:312–3.
2. Bouma W, Lai EK, Levack MM, et al. Preoperative three-dimensional valve analysis predicts recurrent ischemic mitral regurgitation after mitral annuloplasty. Ann Thorac Surg 2016;101:567–75.
3. Braun J, van de Veire NR, Klautz RJ, et al. Restrictive mitral annuloplasty cures ischemic mitral regurgitation and heart failure. Ann Thorac Surg 2008;85:430–6.