Reduction of severe intraprocedural complications during transcatheter aortic valve implantation with an interdisciplinary heart team approach

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We read with great interest the study by Seiffert et al. [1] reporting on their experience of managing severe intraprocedural complications during transcatheter aortic valve implantation (TAVI). In their TAVI experience comprising a total of 458 patients, 7.6% of patients had severe complications [1]. Of these, 2.8% of patients (less than half) required emergent surgical conversion (ECS), including sternotomy [1]. As their TAVI experience grew, their procedural complications fell to as low as 0.9% in recent years. They report a 30-day mortality of those needing ECS to be 38.5% [1]. The results show that TAVI is far from optimal and still has significant technical shortcomings (i.e. valve embolization) as well as the risk of severe complications (i.e. annular rupture), both ultimately requiring ECS.

Some features of the study by Seiffert et al. [1] merit discussion. First, the rate of ECS in their series was somewhat higher than the 1.1% among a large cohort of 9,251 patients that we and others have previously reported in a meta-analysis of all published TAVI literature [2, 3]. This may be because of the relatively smaller number of patients in their study. Alternatively, more than half of their patients underwent TAVI using a transapical approach, a strategy shown in our study to be associated with higher rates of surgical conversion (1.9 vs 0.8% with the transfemoral approach) [2]. Secondly, although the in-hospital mortality in their small study was lower (38.5%) than in our meta-analysis (67.1 ± 37.9%) [2] among patients requiring ECS, so was the EuroSCORE (14.4 ± 7.9 vs 24.4 ± 5.9%) a factor associated directly with mortality [4, 5].

Thus, we would like to caution with regard to their notion that their outcomes after ECS were ‘acceptable’ and attributable largely due to their interdisciplinary heart team approach. It is quite possible that the lower mortality in the series by Seiffert et al. may not be explained by the presence of an interdisciplinary heart team alone (which was also present in the 46 included studies of our meta-analysis), but rather by differences in the baseline demographics and to some extent by the selection of lower-risk patients (EuroSCORE 14.4 ± 7.9%) to undergo ECS, whereas the higher-risk patients (EuroSCORE 22.4 ± 13.6%) with similar complications (i.e. valve embolization) were treated by other modalities (e.g. valve-in-valve implantation). Most importantly, they do not provide any comparison of patients in whom TAVI was performed with and without a heart team approach to support their conclusion.

As TAVI continues to evolve, refinements in patient selection, technology and operator experience are likely to reduce many complications and the need for ECS. We concur with the authors that the heart team approach is key for good outcomes and the successful further development of TAVI as a valuable treatment alternative for select high-risk patients with symptomatic aortic stenosis. However, we would like to caution against the authors’ use of the heart team approach as synonymous with an on-site cardiac surgical programme (authors stress on the ‘prerequisite of institutionalized departments of cardiology and cardiac surgery at sites performing TAVI’). Some centres have adopted a similar ‘heart team’ approach by collaborating with an off-site cardiac surgery team that participates not only in the procedure, but also in patient selection. Preliminary data on the small number of patients enrolled in the German TAVI registry have suggested comparable mortality among patients undergoing TAVI at sites without on-site surgery, but which used this approach compared with sites with the on-site surgical programme (3.8 vs 8.8%, P = 0.12) [6]. We submit that more data are needed on this issue, but until the time that such information is available on larger numbers of patients, we caution against the implicit use of the phrase ‘an interdisciplinary heart team approach’ as synonymous with the on-site cardiac surgery programme.

REFERENCES


LETTER TO THE EDITOR RESPONSE

Reply to Eggebrecht et al.

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We appreciate the discussion raised by Eggebrecht et al. [1] concerning our study on severe complications during transcatheter aortic valve implantation (TAVI) and a heart team approach [2].

The authors allude to the rate of conversion to surgical therapy in patients undergoing TAVI, which was higher in our series (2.8%) than what they had found in a meta-analysis (1.1 ± 1.1%) [3]—possibly an effect of the limited patient numbers. A relationship to the high rate of transapical procedures seems unlikely since we did not find an increased conversion rate in patients undergoing transapical vs transfemoral TAVI [2]. A part of these conflicting numbers may also be related to different strategies of patient selection, execution of procedures and framework conditions. Active participation of cardiac surgeons and cardiologists mutually performing TAVI in a hybrid operating room may lower the threshold for surgical conversion due to the opportunity for surgical bailout manoeuvres. This notion is supported by our findings that after a hybrid operating room became available in our institution in Quartile 2, the surgical conversion rate increased at first (Quartile 1: 1.7 vs Quartile 2 and 3: 5.2 and 3.5%, respectively), before decreasing with growing operator experience and technical refinements (Quartile 4: 0.9%) [2].

We would like to challenge the assumption that the decision to convert patients to surgical therapy was based on baseline demographics, yielding a lower risk profile and improved survival in these patients. A trend towards lower logistic EuroSCOREs was observed in the overall cohort of patients suffering from infra-procedural complications (18.2 ± 11.2 vs 22.5 ± 13.7% in uncomplicated TAVI, P = 0.07), and patients requiring conversion were a subset of this group [2]. Even more, indication for surgical therapy was based on the complication encountered: for instance, while a valve migration towards the aorta can be treated sufficiently by valve-in-valve implantation, embolization into the left ventricle usually requires surgical therapy. One major limitation of our study is the small number of patients, and the mentioned effect may well be attributed to this shortcoming.

We agree with Eggebrecht et al. that our hypothesis attributing a comparatively low 30-day mortality rate (38.5 [2] vs 67.1 ± 37.9% [3]) to a multidisciplinary heart team with equal contribution of cardiologists and cardiac surgeons can be challenged due to the lack of a control group. However, we feel confident that, with the results achieved, a dedicated heart team approach with mutual involvement of both disciplines constitutes an ideal approach to TAVI. Even more, current guidelines acknowledge on-site cardiac surgery as an essential prerequisite for TAVI [4]. At this early stage of the TAVI evolution, we would interpret data implying comparable results using different setups (hospitals with on-site cardiac surgery vs hospitals without on-site cardiac surgery) [5] with caution. As Eggebrecht et al. [1] state, larger datasets are required to draw definite conclusions in this regard and we would like to urge all centres performing TAVI to convey their outcomes to registries, e.g. the German Aortic Valve Registry (GARY) [6], to allow for sufficient data analysis and improvement in patient outcomes after TAVI.

REFERENCES