International Journal of Cardiology 290 (2019) 84–85

Contents lists available at ScienceDirect

International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard

Editorial

Long term TAVI: Only time will tell

César Moris, Pablo Avanzas *

Área del Corazón, Hospital Universitario Central de Asturias, Oviedo, Spain
Instituto de Investigación Sanitaria del Principado de Asturias (ISPA), Oviedo, Spain
Departamento de Medicina, Universidad de Oviedo, Oviedo, Spain

ARTICLE INFO

Article history:
Received 6 May 2019
Accepted 8 May 2019
Available online 11 May 2019

Transcatheter aortic valve implantation (TAVI) has been revolutionary in the treatment of severe symptomatic aortic stenosis. Given the excellent evidence available from randomised trials, we now know that TAVI is superior to medical treatment in patients unsuitable for surgery and is equivalent, or even superior, in patients with high [1,2], intermediate [3,4] and low risk [5,6]. Rarely in medicine have such consistent results been seen across clinical trials. Yet there are still some questions that will only be answered with time, once more implantations have been performed. These areas of uncertainty are the long-term clinical outcomes, the durability of the prostheses and the long-term consequences of intraprocedural complications, such as pacemaker implantation and perivalvular aortic regurgitation. Finally, we must establish if there is a class effect between the different devices, particularly if the long-term results will differ depending on the type of prosthesis used.

The study by Vollenbroich et al. [7] provides data that help to improve our understanding of these issues. The authors present a series of 628 patients followed up for a mean of 5 years (range, 3.4 to 8.3 years) who underwent TAVI with a balloon-expandable Edwards SAPIEN prosthesis (ESV) or a self-expandable Medtronic Corevalve system (MSC). After a mean follow-up of 5 years, the overall mortality in this series was greater than 50%, similar to previously-published studies, due mainly to the risk profile from associated comorbidities [8]. The most noteworthy finding, which must be interpreted with utmost caution, was the higher 5-year cardiovascular mortality rate in patients treated with the ESV compared with those treated with the MSC. The authors did not find significant differences in the preimplantation patient characteristics that could explain this difference in cardiovascular mortality. Could this apparent increased mortality be related to a greater residual gradient with the ESV immediately post-implantation? Going against this theory is the fact that during the follow-up, the authors did not observe a higher rate of degeneration with the ESV. In addition, it is well-known, and was observed in this study, that the MSC has a higher rate of post-implant residual perivalvular aortic regurgitation [9]. Multiple studies have found an association between this finding and mortality at follow-up [3,10], which would also go against the findings reported by Vollenbroich et al. As the authors acknowledge, the observational, non-randomised design of the study means that definitive conclusions cannot be drawn on this point.

One aspect that has generated great debate and has been used as an argument against TAVI is the unknown durability of the prostheses. There is a possibility that, as has occurred with certain surgical prostheses, they could be prone to sudden massive degeneration after a certain period of time. This is reminiscent of the bleak predictions made about the first coronary stents, of which it was said that, over time, fatigue of the materials would lead to their failure.

The definition of valvular degeneration has not been straightforward. Until the emergence of TAVI, a surgical prosthesis was not considered to be degenerative unless it required replacement surgery. Nowadays, due to echocardiographic follow-up, we know that a valve can degenerate without requiring replacement, and key criteria have been established for valvular degeneration and for prosthesis failure, applicable to both transcatheter and surgical prostheses. In this study, the rate of valvular degeneration (5 patients) was exceptionally low, and only one patient required a further intervention (valve-in-valve) for this.

Another aspect of TAVI that warrants great interest are the long-term consequences of intraprocedural complications, such as the development of atrioventricular conduction defects, pacemaker implantation and perivalvular aortic regurgitation. This subject gains relevance given that TAVI patients are increasingly younger with fewer comorbidities, meaning that the life expectancy following implantation is longer than the patients studied by Vollenbroich et al. Again, due to the study design and sample size, we cannot draw firm conclusions, although the authors did not find data to indicate increased mortality in the group of patients treated with the MCS valve, who had a higher rate of these complications.

DOI of original article: https://doi.org/10.1016/j.ijcard.2019.03.050.
* Corresponding author at: Cardiac Catheterization Laboratories, Hospital Universitario Central de Asturias, Avda de Roma S/N, 33011 Oviedo, Spain.
E-mail address: avanzas@secardiologia.es (P. Avanzas).

https://doi.org/10.1016/j.ijcard.2019.05.023

Finally, the study allows a comparison of the results obtained for each type of prosthesis—ESV vs MSC—in a uniform setting of a single centre of excellence. It should be borne in mind that many of the cases analysed involved the first models of both prostheses, so results may not be directly applicable to present day cases. Nonetheless, the findings coincide with those from other studies in which MSC had a higher rate of pacemaker implantation and moderate-to-severe perivalvular aortic regurgitation, without resulting in a higher long-term mortality.

In conclusion, the article by Vollenbroich et al. provides valuable information on aspects of TAVI that are thus far not well-established. More randomised studies are needed to address these gaps in the evidence.

Declaration of Competing Interest

The authors report no relationships that could be construed as a conflict of interest.

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