EDITORIAL

Transcatheter aortic valve replacement: The future is here

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Transcatheter aortic valve replacement (TAVR) represents a great step forward in cardiology in the last 50 years. Not only because it represents a non surgical option for the treatment of heart valve disease which is treated more frequently with interventions in those developed countries, (19) but because the degenerative aetiology of this heart valve disease makes an increase in the population to be treated and because elderly patients represent strong fragility and associated comorbidities that increase the surgical risk.

The treatment of choice of symptomatic severe aortic stenosis or with affectation of left ventricular function is valve replacement surgery. (2) However, due to the excellent results of this technique, up to one third of the patients with severe aortic stenosis are not operated. (3) The main reason is the high surgical risk, sometimes as a result of objective estimation through validated scales (Euroscore and STS score), but some others times based on subjective perception of the patient's doctor. Whatever the case, transcatheter treatment opens new possibilities in those patients with ominous prognosis if they are not operated. (4, 5)

There are two approved prostheses for transcatheter implantation for clinical use (Medtronic Core Valve System®, Medtronic Inc, Minneapolis, MN, USA and Edwards-SAPIEN®/XT, Edwards Lifesciences, Irvine, CA, USA), with which more than 30000 patients had been treated. Multiple series have demonstrated the viability of these techniques.

The obtained hemodynamic outcomes with both of them are excellent and show a notable clinical improvement, with no evidence of deterioration of the prosthetic function at the end of two years. (6) PARTNER B, (5) a randomized study which compares the TAVR of Edwards-SAPIEN valve with the standard treatment in those inoperable patients, shows excellent outcomes: in the group of TAVR there was a significant decrease in the global and cardiovascular mortality and the hospitalizations in comparison with the medical treatment. These outcomes support the role of TAVR as a treatment of choice in those patients considered inoperable. The preliminary outcomes of PARTNER A, recently presented, show that in those patients with high surgical risk TAVR is not lower than a conventional surgery concerning global mortality at one year, what makes this technique an alternative to surgery in selected patients. Lastly, SURTAVI, a randomized study of surgery versus CoreValve, tries to give information about the usefulness of this technique in groups of lower risk.

Cura et al. present in this issue of the Argentine Journal of Cardiology the initial experience with the transcatheter replacement of CoreValve in four Argentine highly specialized centers (21 patients). (7) The rate of success of the procedure is elevated and the observed risk is lower than the estimated theoretic risk. This series analyzes the complications that are more frequently seen after the implantation of the CoreValve valve. First, the necessity of a permanent pacemaker. Disorders of conduction after the TAVR are related to the depth of the implantation in the outflow tract of the left ventricle. This determines that nowadays implantations should be performed as high as possible. Post-implantation aortic regurgitation is a factor of bad prognostic; in the case of CoreValve, it can be treated by post-dilatation with balloon or with the implantation of a second prosthesis inside the first one, depending on the mechanism of the prosthesis. Lastly, the procedure may present serious complications, as the two cases of ring rupture in Cura et al. series. Nowadays, the previous implantation valvuloplasty is performed with balloons of smaller diameters than when initiating the technique, to avoid this complication. There are some facts to improve, which need the help of the medical community as well as the companies implied in the developing of these devices:

1. The peculiar characteristics of this group of patients makes important a multidisciplinary treatment which involves clinical and interventionist cardiologists, cardiac surgeons, imaging specialists and anaesthetists, in order to assess each patient in a comprehensive way and define the most adequate treatment and the strategy.
2. Technological improvements in order to decrease the profile of the devices, minimizing vascular traumatism in the access point, are necessary. Release systems allow more accurate implantations and the capacity to remove the prosthesis if the implantation is not adequate.
3. As there is no objective scientific evidence establishing which characteristics better describe the right patient , we base the choice of patients on the criteria of the most expert operators. (8) Although

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it is clear that the characteristics of the vascular access and the aortic valve complex are related to the success of the procedure and the rate of complications, we do not know which technique is the appropriate to characterize these structures and which cohort points are associated with the best outcomes. Nor do we know which benefit could provide this technique in patients with coronary or associated significant valve disease.

4. The design of the available prostheses (and their release systems) differs substantially. It is important to know the details of each design and procedure in order to avoid and solve complications.
5. It is important to know that the procedure does not finish with a successful implantation. Patients are fragile and vulnerable. They may feel sick in hospital settings and need a careful handling of bougies, vias and even drug dosing.

In conclusion, the treatment of transcatheter aortic stenosis is a great step forward in cardiology in recent years. Time will demonstrate if this technique is also good in those patients with lower surgical risk and how society is able to afford the additional cost that TAVR implies in an increasing population, as the elderly one. What we can assure is that we have a novel treatment that decreases mortality and improves the quality of life in a selected group of patients who until now had no therapeutic option.

If we consider that these techniques are in early stages of development, with experiences based on the use of first-generation devices and with most of the centers and operators learning, we are sure outcomes will improve in the following years.

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