



## EDITORIAL COMMENT

# The place of a stentless aortic bioprosthetic valve

## O lugar de uma bioprótese aórtica sem *stent*

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Despite progress in prosthetic valve manufacturing and the different types of valves that have appeared in the last two decades, the ideal replacement valve is yet to be found. Stentless aortic bioprosthetic valves were introduced to overcome some of the disadvantages of stented valves, particularly to improve hemodynamics, by increasing the effective orifice area, and to increase durability. Despite some enthusiasm, the greater technical demands of implanting stentless aortic valves have favored the widespread use of stented valves, leaving stentless valves with advantages in patients with a small aortic root or impaired left ventricular function, in whom the better hemodynamics of the stentless valve may result in better long-term results.<sup>1</sup>

The study by Andrade et al.<sup>2</sup> published in this issue of the *Journal* describes the short- and medium-term outcomes of Freedom Solo and Solo Smart stentless aortic valves in a single-center experience. The authors present a retrospective cohort involving 345 patients regardless of primary indication for surgery or concomitant procedures. The perioperative results were good, as was the hemodynamic performance of the valve at six months, as demonstrated by the low mean gradient and large effective orifice area, and also reflected in the low incidence of patient-prosthesis mismatch. Concerning long-term follow-up, the high survival and low rate of structural valve degeneration and endocarditis are encouraging, although a period longer than six years is warranted to confirm these expectations. As pointed

out by the authors, the results are similar to previously published findings,<sup>3,4</sup> and may suffer from selection bias that could affect comparisons with stented bioprostheses.

The way to change the paradigm of surgical options and bring about more widespread use of stentless valves is to prove that the more technically demanding, and thus potentially riskier, procedure is more beneficial to patients. In fact, current stentless valves are less demanding to implant, due to the simplified single suture line. Data comparing the Freedom Solo with stented valves have been recently published. Wollersheim et al.<sup>5</sup> compared outcomes of the Freedom Solo and the Mitroflow bioprosthetic valve in patients with a small aortic root. Cross-clamp times for isolated replacement procedures were similar, around 80 min, and eight-year survival did not differ between groups, although the stentless valve had an impressive 0% cumulative incidence of aortic valve reoperation at seven years compared to 7.1% for the stented valve. Christ et al.<sup>6</sup> compared the hemodynamic performance of the Freedom Solo to that of a stented valve (Labcor Dokimos Plus) and found no significant difference in effective orifice area. Finally, from the same group as the present paper, Cerqueira et al.<sup>7</sup> compared the stentless Freedom Solo to the stented Trifecta. In a propensity-matched population, the stented valve showed a better hemodynamic profile, although reverse remodeling and six-year survival were comparable between the groups.

Dealing with small aortic roots, the potential for patient-prosthesis mismatch, and the desire to improve the

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hemodynamics of bioprostheses have long been concerns of surgeons. Aortic root enlargement to enable placement of a larger prosthesis has also proved to be feasible and effective.<sup>8</sup> The sutureless aortic prosthesis recently appeared as an option with apparently excellent hemodynamics, reducing cross-clamp and cardiopulmonary bypass times and facilitating minimally invasive surgery and complex cardiac interventions.<sup>9</sup> The exponential growth of transcatheter aortic valve implantation has added this technique to an already complex equation.<sup>10</sup> While the data presented by the authors enrich the literature, it is likely that only randomized trials and longer follow-up times can give a clear view of the place of the Freedom Solo stentless aortic bioprosthetic valve in valve replacement surgery.

### Conflicts of interest

The author has no conflicts of interest to declare.

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