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## Mid-term haemodynamic is important after implantation of a tissue valve but long-term durability is what makes the difference

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The authors of this paper have to be congratulated for providing us with a comparison of the mid-term clinical and haemodynamic results following implantation of the Sorin Freedom Solo stentless bioprosthesis and the Carpentier Edwards Perimount stented tissue valve, in the form of a single-centre retrospective study [1]. This is because there are only few papers focusing on haemodynamics of the Freedom Solo valve when compared with reports on that with the Perimount valve.

I remember that in the mid-1990s, referring cardiologists insisted on implanting stentless valves because they expected better haemodynamics with postoperative transvalvular gradients similar to those of native valves and more rapid regression of left ventricular hypertrophy than stented valves [2, 3]. And this was true since gradients at rest and during exercise, as well as at the rise, were usually found to be lower in patients with stentless prostheses compared with patients with stented valves, indicating that the stentless valve may perform better under physiological stress [4, 5].

Although the information contained in this paper are interesting, there are still a few additional points that have to be emphasized:

- (i) The mean follow-up of 3.6 years is quite short since the expected durability of a tissue valve should be close to 18–20 years.
- (ii) The method of sizing a valve is quite different from one model to the other and the templates provided by the industry generally do not correspond perfectly to the definitive valve size.
- (iii) The suturing technique is quite different between a stented and a stentless valve and in addition, the Freedom Solo valve can be fixed to the aortic root in a simplified and unique manner with one single running suture.
- (iv) In contrast to that, the Perimount valve was implanted in a supra-annular position with everted sutures. This technique unfortunately narrows the aortic annulus by pushing the sewing cuff of the valve into the annular area.

In terms of methodological weaknesses,

- (a) The Solo stentless valve was implanted by the most experienced surgeons only whereas the Perimount valve was used by 10 different surgeons. This is due to the fact that stentless valve implantation is less reproducible and standardizable than implantation of a stented valve, and
- (b) The Solo stentless valve was used less frequently during combined valve and CABG procedures compared with the Perimount valve.

In that sense, comparing the duration of extracorporeal circulation time and cross-clamping time between the two groups of patients could somewhat be biased.

Finally, I would like to add that although the design of the Solo valve mimics that of the native healthy valve through unrestricted adaption to the patient's anatomy and haemodynamic performance may be superior to that of stented valves [6], our group has reported some critical observations regarding its durability [7, 8]. We believe that optimal performance and freedom from structural valve deterioration depend on correct sizing and perfect symmetric implantation of the Solo valve, to ensure low leaflet stress. One particularity during implantation of the Solo valve is that the three leaflets are of equal size whereas the native sinuses are rarely perfectly symmetric. Any excessive tension may lead to tissue fatigue over time.

In the future, more reports will be welcome to assess the long-term performance of the Solo stentless valve and allow a comparison with 'older' stented valves.

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