EDITORIAL COMMENT

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Rapid deployment prosthesis: a powerful tool to be used wisely

Rapid deployment (RD) valves have emerged in the surgical aortic valve replacement (SAVR) spectrum to facilitate the procedure. Traditional advantages attributed to these prostheses include shorter cardiopulmonary bypass (CPB) and cross-clamp times (XCT).[1] In 2019, there are two available: Intuity Elite™ (Edwards Lifesciences, Corp, Irvine, CA USA) RD prosthesis and Perceval™ (LivaNova PLC, London, UK) sutureless prosthesis. A third RD one, 3F Enable™ (Medtronic, Inc, Minneapolis, MN USA) is off the market since 2015.

According to the manufacturers, these devices are approved for aortic stenosis and steno-insufficiency patients. Typically, pure aortic regurgitation, endocarditis, multiple valve surgery and ascending aorta dilatation are contraindications for RD and sutureless valves. However, multiples reports have been published with successful off-label implantation of these devices in patients with concomitant mitral valve replacement,[2] supracoronary ascending aorta replacement,[3] bio-Bentall procedure,[4] and endocarditis.[5]

In fact, RD valves have some other advantages beyond better CPB and XCT times. They are useful in calcified aortic roots and are a valuable tool in minimally invasive procedures, mainly in right anterior minithoracotomy SAVR. Therefore, with increased experience and confidence from the surgical community, these expanding indications for RD valves will probably become even broader.

However, a word of caution must be written about this topic. In fact, the implantation technique for these valves seems to be easier than conventional stented valves. However, there are some particular aspects that require careful attention. For instance, a correct sizing is essential to achieve the best hemodynamic results. In fact, oversize is related to worse hemodynamic outcomes in sutureless valves, and perhaps a combination of CT-scan sizing and intra-operative sizing after native aortic valve removal would be more appropriate.[6] Additionally, these valves seem to be associated with increased pacemaker rate implantation and para-valvular leakage.[7] However, it is demonstrated that these complications can be mitigated by the learning curve overcome, which highlights the importance of dedicated teams with a significant RD valve SAVR caseload to improve the outcomes.[8]

Again, increased experience with these devices culminates into its broader application. Therefore, Santa Maria Hospital group must be congratulated for their expertise with RD valves, which is evident by this new application for them – combined SAVR with supra-coronary aortic replacement.[9] Their initial experience is very promising, showing outstanding CPB and XCT times. However, in this small sample, these reduced times do not appear to be associated with a significant improvement in clinical outcomes. Nonetheless, as this combined procedure with RD valves seems to be safe, it is essential to encourage their group and other Portuguese groups with significant experience with these devices to continuously pursuit innovation. In the end, there is no doubt that this will translate into better outcomes for our patients.

REFERENCES

1. Glauber M, Moten SC, Quaini E, et al. International Expert Consensus on Sutureless and Rapid Deployment Valves in Aortic Valve Replacement Using Minimally Invasive Approaches. Innovations (Phila). 2016 May-Jun;11(3):165-73.
2. Minh TH, Mazine A, Bouhout I, et al. Expanding the indication for sutureless aortic valve replacement to patients with mitral disease. J Thorac Cardiovasc Surg 2014;148:1354-9.
3. Concistrè G, Chiaramonti F, Bianchi G, et al. Aortic Valve Replacement With Perceval Bioprosthesis: Single-Center Experience With 617 Implants. Ann Thorac Surg. 2018 Jan;105(1):40-46.
4. Gennari M, Agrifoglio M, Polvani G. Composite graft using an Edwards Intuity Elite rapid deployment bioprosthesis for aortic root replacement. J Card Surg. 2017 Mar;32(3):193-195.
5. Ruchonnet EP, Roumy A, Rancati V, Kirsch M. Prosthetic Valve Endocarditis after Transcatheter Aortic Valve Implantation Complicated by Paravalvular Abscess and Treated by

Pericardial Patches and Sutureless Valve Replacement. Heart Surg Forum. 2019 Apr 4;22(2):E155-E158.
6. Cerillo AG, Amoretti F, Mariani M. Increased Gradients After Aortic Valve Replacement With the Perceval Valve: The Role of Oversizing. Ann Thorac Surg. 2018 Jul;106(1):121-128.
7. Ensminger S, Fujita B, Bauer T. Rapid Deployment Versus Conventional Bioprosthetic Valve Replacement for Aortic Stenosis. J Am Coll Cardiol. 2018 Apr 3;71(13):1417-1428.
8. Barnhart GR, Shrestha ML. Current Clinical Evidence on Rapid Deployment Aortic Valve Replacement: Sutureless Aortic Bioprostheses. Innovations (Phila). 2016 Jan-Feb; 11(1):7-14.
9. Ferreira R, Junqueira N, Arruda R, Nobre A. Concomitant ascending aortic replacement and aortic valve replacement usingrapid deployment bioprosthesis. Rev Port Cir Cardiotorac Vasc. 2019; 26(3):195-198.