

CORRESPONDENCE

Letters to the Editor

Is it Reasonable to Treat All Calcified Stenotic Valves With a Valve Stent?

Probably Yes If We Get a Full Stent Expansion

We read with interest the article by Zegdi et al. (1) regarding the appropriateness of percutaneous valve implantation in calcified aortic valve stenosis. The study evaluated the behavior of intraoperative valved stent implantation inside human stenotic aortic valves before surgical valve replacement. The investigators reported a stent misdeployment, with an elliptical or triangular stent shape, in a large number of tricuspid (32%) and in all bicuspid valves, accounting for variable gaps at the commissures level between the stent's external surface and the inner surface of native valve (1). This finding represents the proof of concept of perivalvular leak observed early after percutaneous valve implantation in human calcified aortic valves (2,3). In addition, the investigators hypothesized that stent misdeployment and consequent valve distortion, increasing the stress on valve leaflets, may lead to premature leaflets tears or fibrosis and valve dysfunction (1).

In our opinion, some concerns exist about the results of this study. First, the intraoperative model may be not completely representative of the self-expandable valved stent behavior in the beating heart. In this regard, the deployment of the self-expanding stent continues for a long run after the implantation, as the nitinol frames get back to the original shape and dimensions (4). This mechanism may explain the reduction in perivalvular leaks observed over time after self-expandable aortic valve implantation, as recently reported by Grube et al. (2). To the contrary, in the experience reported by Zegdi et al. (1) the stent remained in place for no more than 2 min, so the investigators lacked the opportunity to evaluate the device after full stent expansion. Moreover, the stents were implanted in calcified aortic valves without balloon valvuloplasty (1), which is common practice before percutaneous valve implantation (2,3). Indeed, as acknowledged by Zegdi et al. (1), pre-dilation with appropriate balloons, providing fragmentation of the leaflets calcification (5), may improve the pliability of native valve leaflets and, therefore, favor the circular deployment and stent apposition to the aortic wall. We strongly believe these issues should be addressed to definitely establish the behavior of self-expanding stent-based percutaneous bioprosthesis in the human heart.

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Reply

We thank Dr. Napodano and colleagues for their valuable comments and their efforts to make our study more comprehensible (1). One should remark that the title of their letter implicitly suggests that adequate stent expansion is an important goal to be achieved during percutaneous valve implantation.

A major finding from our study was that stent expansion was inappropriate in all bicuspid aortic valves. From a purely geometric point of view, getting a full stent expansion in this type of anatomy is elusive because the length of the leaflet's margins is always lower than the circumference of the aortic orifice (in tricuspid aortic valves, these 2 lengths are close). The usual elliptical aspect of the stent in this clinical setting is attributable to the high leaflet rigidity in this disease, a fact well-known by surgeons (and typically depicted in Fig. 1 of our article [1]).

We completely agree with Napodano and colleagues on the fact that stent deployment in an arrested heart during 2 min (as in our study) may not reflect stent deployment in a beating heart in the long run. Perivalvular leak may regress, but this needs better characterization. If one assumes that stent expansion is a contin-