



## VENTRICULOARTIC JUNCTION REMODELING—HOLY GRAIL OF BICUSPID REPAIR

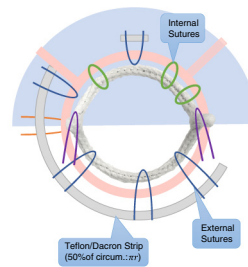
### To the Editor:

A very interesting paper dealing with the biomechanical characteristics of annuloplasty during bicuspid aortic valve (BAV) repair highlighted 2 important

elements of successful BAV repair: 180° symmetrical configuration and dynamic remodeling of the ventriculoaortic junction.<sup>1</sup> The discussion regarding the concept of 180° configuration arose after Aicher and colleagues<sup>2</sup> showed that postoperative commissural asymmetry was the strongest predictor of repair failure. Subsequently, the El-Khoury's group modified their reimplantation technique by tailoring the commissural angle to 180° and proved its reproducibility and effectiveness.<sup>3</sup> Annuloplasty with the HAART ring (ie, hemispherical aortic annuloplasty remodelling technology; BioStable Science and Engineering) is the other method that offers a 180° commissural configuration—2 symmetrically opposite commissural posts ensure an ideal valve configuration.<sup>4,5</sup> The internal geometric ring provides full 3-dimensional annular stability and ensures commissural orientation at 180° while minimizing the dissection of the aortic root, pulmonary artery, and right ventricle and avoids reimplantation of the coronaries. The success of this approach relates to ventricular aortic junction remodeling. Its aim is to achieve a symmetrical 180° orientation of both fused and nonfused leaflet annuli. The fused leaflet annulus often needs significant reduction from 240° down to 180°. As a result, significant mobility increase can be achieved, resulting in a low gradient, as shown by the BAVr Working Group.<sup>6</sup> Interestingly, as shown by Girdauskas and colleagues,<sup>1</sup> annuloplasty techniques are different in addressing dynamical annulus remodeling as a result of the inconsistent nature of muscular and fibrotic annulus. Both external ring annuloplasty and suture annuloplasty do not provide predictable remodeling of stiffer muscular annulus. Therefore, both parts of annulus may require different approaches of stabilization; otherwise, remodeling may not achieve 180° symmetry (Figure 1). The technique of BAV repair with significant attention to ventriculoaortic junction remodeling using both external and internal stabilization has been published as a tutorial by Jasinski<sup>5</sup> (Figure 1). The external annuloplasty covering the basal ring from the left fibrous triangle to the muscular septum provides stabilization of the easily accessed fibrous portion of the annulus, allowing when necessary for easier remodeling of stiffer muscular annulus either by reimplantation or



### 180° (50%) Algorithm : VAJ Remodeling



#### Fused Leaflet Annulus

- Aim- 50% of circumference
- (reduced from 50%-66%)
- 5 sutures remodeling

#### Non-Fused Leaflet Annulus

- Aim- 50% of circumference
- 3 sutures remodeling

**FIGURE 1.** Ventriculoaortic junction (VAJ) remodeling—the same size of fused and non-fused annulus, as well as muscular and fibrotic annulus (180° [50%] paradigm). Gray zone: reduced fused, muscular annulus down to 50% of circumference with internal anatomical remodeling ring.

additional internal stabilization. This combined approach may successfully result in continuous gradient amelioration, as shown by the long-term study by Jasinski and colleagues.<sup>7</sup> Greater gradient resulting from suboptimal fused leaflet mobilization may, in contrast, hamper long-term durability, as shown by Spadacio and colleagues.<sup>8</sup>

The authors should be congratulated for bringing up the yet-unresolved issue of optimal techniques of annulus stabilization due to unique biomechanical characteristics of different annular segments, resulting in different postoperative hemodynamics.<sup>1,9</sup>

Marek J. Jasinski, Professor, MD, PhD, FETCS<sup>a,b</sup>

<sup>a</sup>Clinical Department of Cardiac Surgery  
Institute of Heart Diseases  
Wroclaw Medical University  
Wroclaw, Poland

<sup>b</sup>Department of Cardiothoracic Surgery  
Royal Brompton and Harefield Hospital  
London, United Kingdom

### Conflict of Interest Statement

Dr Jasinski reports Clinical Advisory Board to Medtronic and Consultant to Corcym.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

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