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Commentary: Enlargement of the aortic annulus: Always a technical price to pay

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The relevance of aortic annulus enlargement has evolved in contemporary cardiac surgical practice. In this issue of *Techniques*, Yang¹ describes a modified technique to accomplish implantation of a larger valve prosthesis. The author correctly points out that surgeons must not only be concerned with avoidance of prosthesis–patient mismatch but also with feasibility of future valve-in-valve transcatheter aortic valve implantation (TAVI). Data suggest that valve-in-valve results may be suboptimal in surgical valves smaller than 23 mm.²

The classic Manouguian and modified Nicks techniques call for opening the left atrium and extending the patch onto the anterior leaflet of the mitral valve.^{3,4} These operations increase procedural complexity and may increase morbidity and mortality. In practice, this author has observed that to reduce the risk of mitral regurgitation and operative complexity, many surgeons extend the incision only down onto the aortic valve leaflet insertion. The left atrium and anterior leaflet are not violated. The prosthesis is then sewn onto the mid-height of the patch, resulting in a slightly tilted valve. While this will work in the majority of cases, it may not be sufficient where an increase of 2 full sizes of enlargement is truly required.

In this paper, the author describes an interesting modification of the Manouguian technique for annulus enlargement. The primary intention of the modification is to

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avoid violation of the mitral valve and thus mitigate the risk of induced mitral regurgitation. While it seems this goal will largely be accomplished by this technique, there are technical concerns that remain.

The transition of the fibrous skeleton and aortomitral curtain to the anterior leaflet of the mitral valve can be ill-defined and difficult to recognize in some patients. Deep stitches in this region could still result in inadvertent tension on the anterior leaflet. To mitigate this risk, the author describes an inverted Y-shaped rather than T-shaped incision extending below the nadirs of the non- and left coronary cusps. This leaves extra tissue above the aortomitral curtain and avoids tension on the leaflet. The extension of the incision under the nadirs raises the possibility of another theoretical technical issue. By sewing in a rectangular patch, the left main coronary ostium is displaced, as it will rotate in an arc in a slightly lateral and cephalad direction. This raises the potential for distortion and kinking, causing coronary ischemia. In addition, the location of the left main ostium may be abnormal if subsequent valve-in-valve TAVI is required.

This modified technique appears likely to be quite effective when significant annular enlargement is required. Attention will still need to be paid to the aforementioned issues. A final comment on the relevance of these techniques. There is growing enthusiasm among some to

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advance TAVI as the primary treatment for aortic stenosis in younger, low-risk patients. To provide an accurate counterpoint, it is increasingly important that surgeons safeguard excellent outcomes associated with surgical aortic valve replacement. To the extent that avoidance of prosthesis–patient mismatch increases valve durability and improves freedom from reoperation, annular enlargement techniques will continue to be a critical arrow in our surgical quiver.

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