Author has nothing to disclose with regard to commercial support.

we are moving rapidly toward less-invasive means to replace aortic valves.

We have not had experience with the Cor-Knot (LSI solutions, Victor, NY). Because the Enable required a guiding suture that some surgeons preferred to tie, I believe that the Cor-Knot might be advantageous, especially in patients with narrow sinotubular junctions with little room for a surgeon's fingers between the nitinol cage and the aortic wall. This would be applicable for the other sutureless bioprostheses such as the Perceval (Sorin, Saluggio, Italy) or Intuity (Edwards Lifesciences, Irvine, Calif) that do require tying of the guiding sutures.

We have used the Enable valve in redo aortic valve replacements but we have always completely excised the old prostheses. In theory, one could contemplate valve-in-valve implantation after removing the degenerated prosthetic leaflets, but this would be considered off-label use.

We have not performed double-valve replacement using the Enable valve in the aortic position but would not have hesitated to do so if a patient required it. The very low subannular protrusion of the Enable prosthesis would unlikely have interfered with the mitral prosthesis. We certainly would recommend implanting the mitral valve first and positioning it in a supra-annular position.

The use of the Enable prosthesis within a Gelweave Valsalva graft (Vascutek, Inchinan, United Kingdom) is an interesting idea that we have not tried and would have to be tested in vitro before human use. I am not certain the landing zone provided by the narrow junction between the sinus of Valsava and lower tubular portions of the graft would be broad enough to offer secure stabilization of the prosthesis.

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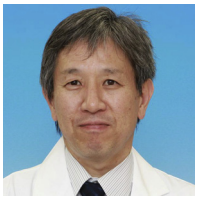

AORTIC ROOT ENDOSCOPY FOR AORTIC VALVE–SPARING OPERATIONS

Author have nothing to disclose with regard to commercial support.

To the Editor:

We read with great interest the article by Tsagakis and colleagues[1] on the intraoperative evaluation of repaired aortic valve geometry by angioscopy. We have been using aortic root endoscopy in valve-sparing aortic root replacement operations at our institutions since 1995.[2,3] We would like to comment on the efficacy of intraoperative endoscopy to evaluate repaired aortic valves.

Intraoperative macroscopic evaluation of a repaired aortic valve is not always accurate because the aortic cusps are released from the perfusion pressure and the root loses its tension once the root is opened. The natural configuration of the root is thus altered, and recognizing any malcoaptation or overstretching becomes difficult.[2] Experience is required to predict the result of repair and to avoid secondary aortic clamping for additional valve repair or replacement.[1] Prolapse of the repaired aortic valve could be among the factors that cause suboptimal long-term results.[4] However, detection of prolapse during cardiac arrest is difficult. Recently, effective height has been used for detection of prolapse of repaired aortic valves.[5] The effective height is an excellent parameter for detection of minor valve prolapse. However, the result would be influenced by the retraction tension on the commissures and the amount of force on the free margin of the valve by the caliper bar. Therefore, an error could occur because of these factors. Thus, we evaluate the aortic valve before and after repair using intraoperative endoscopy combined with macroscopic findings and the measurement of effective height.

After crossclamp of the ascending aorta, crystalloid cardioplegic solution is infused into the root, and this allows visualization of the pressure-loaded valve in the closed position. A videoscope (Olympus LTF type VH; Olympus, Tokyo, Japan) is inserted into the aortic root and the aortic valve is investigated. The final indication for valve sparing is determined based on the endoscopic findings. Then, aortic root remodeling is performed. First, the effective height of the repaired aortic valve after aortic root replacement is measured. Next, a videoscope is placed within the lumen in the clamped prosthetic graft with perfusion of normal saline under physiologic pressure (50-80 mm Hg). The measurement of effective height along with the endoscopy findings could result in the need for an additional procedure before weaning from cardiopulmonary bypass if there is prolapse of the cusps. If necessary, additional central plications are performed to the prolapsed cusps and endoscopy is repeated. Finally, the optimal configuration of the valve is confirmed with endoscopy (Figure 1). After confirmation, bleeding is evaluated by perfusion of blood into the graft, and some additional

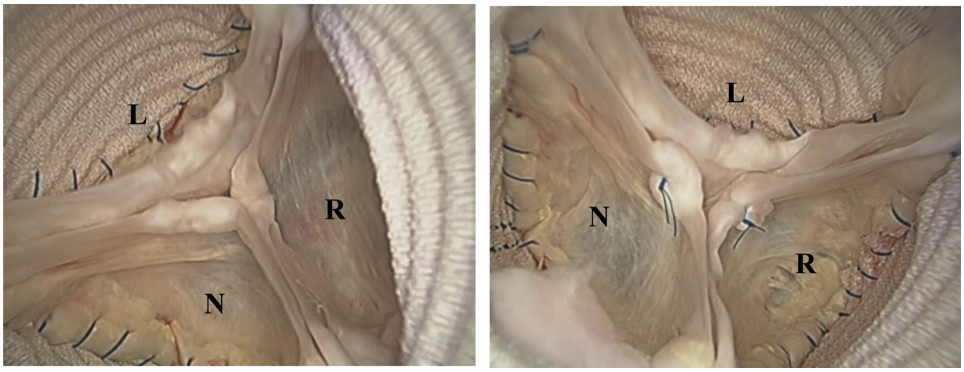

FIGURE 1. Intraoperative aortic root endoscopic findings. *Left*, Left and noncoronary cusps were prolapsed after remodeling. *Right*, Optimal configuration of central plicated left and noncoronary cusps was confirmed. *L*, Left coronary cusp; *N*, noncoronary cusp; *R*, right coronary cusp.

hemostatic sutures are placed if necessary. Then, both coronary arteries are reconstructed and the distal graft anastomosis is completed.

Although determination of the actual degree of aortic regurgitation might be difficult and the image is only 2-dimensional, the endoscopic method is simple and reproducible. This method allows the opportunity to correct a minor prolapse and leak before aortic declamping.

In conclusion, with the combination of effective height measurement and the aortic root endoscopy, more detailed information on the repaired valve can be obtained. As a consequence, improved results of the aortic valve-sparing operation may be obtained.

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AORTIC ROOT ENDOSCOPY

Reply to the Editor:

We thank and give credit to Furukawa and colleagues[1] and Itoh and colleagues[2] for the introduction of aortic root and valve endoscopy during aortic valve (AV)-sparing surgery in 1995. The fact that the accuracy of on-clamp AV evaluation in the diastolic position under pressure was demonstrated by Itoh and colleagues, and confirmed by us, thus encouraging our policy to control the AV endoscopically after repair and to proceed to additional valve corrections immediately without echocardiographic examination. Meanwhile and after experience with AV endoscopy in more than 100 elective and emergency cases, this technique improved our knowledge about "how to do and choose" valve-sparing repair techniques respecting the anatomic configuration of the AV components to achieve a symmetric and functionally accurate configuration of the valve apparatus.

The complexity of the AV apparatus requires extensive experience to deal with sizing, commissures, remnant aortic wall fixation, and free margin reconstruction. Techniques to standardize parameters, such as an effective height of leaflets and commissures, facilitate the decision making intraoperatively but do not reduce the complexity of the procedure and technical failure. Malas and colleagues[3] estimated a learning curve of approximately 40 to 60 AV-sparing surgeries to reproduce the safety and efficiency of the technique. Thus, in our opinion, the surgeon's experience remains the most important factor for durable AV and root repair.

Echocardiography is the only instrument to evaluate the AV result after repair. Residual regurgitation, coaptation length, and prolapse are detected accurately. However, echocardiography does not differentiate directly the reason for residual valve