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Commentary: Standardized adaptation of aortic valve reimplantation to cusp geometry

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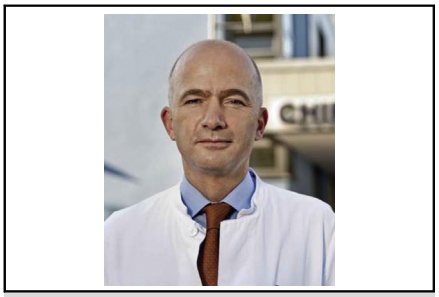

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CENTRAL MESSAGE

Aortic valve reimplantation can be adapted to given cusp sizes by calculated reduction of annular diameter.

The goal of valve-preserving root replacement is the restoration of normal aortic valve form, coaptation, and thus function to achieve the best valve durability. To achieve this, the operation must accommodate the geometry of the cusps, which may differ in size. Several studies have shown that effective cusp height[1] is a good indicator of valve configuration. In normal aortic valves, it has a close correlation with geometric cusp height.[2,3] To achieve normal aortic configuration with adequate coaptation through valve-preserving surgery, modification of annular and sinotubular dimensions may be helpful.[4] In particular, reduction of annular size can improve coaptation.

Aortic valve reimplantation is probably the most popular form of valve-preserving aortic replacement; it stabilizes the aortic root at annular and sinotubular level. Different graft-sizing methods are employed,[5,6] even though many surgeons simply use a 30-mm graft. Both annular and sinotubular dimensions will be more or less identical if a tubular graft is used. The given cusp sizes, however, may require size adaptation, ie, further reduction of annular size to improve valve coaptation. As yet, this is done based on subjective surgical judgment or involuntarily on tying the basal sutures.

The current proposition[7] takes a controlled approach to annular size adaptation, using a simple formula with geometric cusp height as the determinant. Effective height is set at 45% of geometric height, as found in normal aortic valves.[3] Annular size is predicted and controlled by tying the lower suture line around a Hegar dilator of the desired size.

Using their formula, the colleagues could achieve normal aortic valve form and function in a reproducible fashion.[7] While the results are early and need to be confirmed by more experience and other surgeons, this approach appears as an interesting modification of the standard operation toward a geometry-based reconstruction of the aortic valve. It may help others to improve the results of aortic valve reimplantation, even in the absence of extensive personal experience.

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