Management of severe mitral annular calcification: “Cutting the Gordian knot”

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Management of mitral annular calcification (MAC) can be a formidable undertaking. Simple solutions to allow us to cut the Gordian knot of this surgical problem are not available, and each current therapy is fraught with significant risks and complications.

The Gordian knot is a legend of Phrygian Gordium, associated with Alexander the Great. It is often used as a metaphor for an intractable problem (disentangling an “impossible” knot) solved easily by finding a loophole or thinking creatively (“cutting the Gordian knot”). Alexander the Great gave a simple solution to the problem by cutting the knot with his sword. A similar Gordian knot in the field of cardiac surgery is management of MAC. MAC is a chronic process affecting the fibrous skeleton of the mitral valve. Mitral valve surgery in patients with MAC can be a formidable undertaking even in the most experienced hands and may result in higher mortality rates.¹ The study by Bedeir and colleagues¹ is essential and highlights some harsh truths about the challenges in patients with MAC. First, there is no ideal solution for these patients, and any strategy is fraught with unique risks and complications. Second, the 2 main surgical approaches include (1) the complete decalcification strategy, in which all the mitral annular calcium is removed and the mitral valve annulus is reconstructed with sutures or a patch; and (2) the “respect” technique, in which the MAC is left alone and the surgeon tries to work around it. A third option of transcatheter mitral valves in patients with MAC is in the primary stages. Initial reports show high operative mortality rates and risks of left ventricular outflow tract obstruction. Careful planning and selection of patients for these novel techniques will improve the results overtime.

Regarding the different surgical approaches for the management of MAC, the authors provide a useful and important algorithm that stratifies patients by surgical and anatomic risk, which can be a valuable tool for the management of these patients. In patients with high or prohibitive surgical risk, medical therapy or transcatheter

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Central Message

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valves are indicated. For those with lower risk, if mitral repair is feasible, an approach would be a supersized annuloplasty or unconventional annuloplasty. No annuloplasty is also an option because in patients with MAC the annulus will most likely not dilate.² For severe MAC, complete decalcification and reconstruction are required. For patients who require mitral valve replacement with a large annulus, intra-annular implantation needs to be considered, whereas for a small annulus, complete decalcification and reconstruction is a better option. However, each of the options is associated with risks (atrioventricular disassociation for the decalcification and perivalvular leak for the “respect” strategy) that are sometimes significant. Newer technologies and improvement of the percutaneous mitral valve design may allow us to cut the Gordian knot of this difficult surgical problem. In the interim, careful planning and application of each strategy to a specific subset of patients with MAC may prevent complications.

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