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Commentary: You cannot fix what you cannot see

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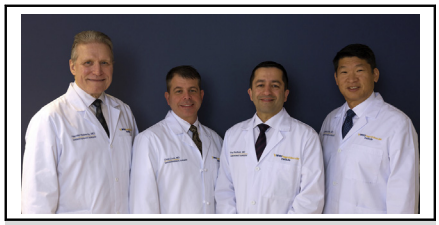

Drs Roberts, Cook, Badhwar, and Wei

CENTRAL MESSAGE

As minimally invasive cardiac surgical platforms continue to expand, the most successful and reproducible will be those that afford the most optimal visualization.

In this issue of JTCVS Techniques, Fukumoto and colleagues[1] have reported a case of endoscopic repair of an aorta to right ventricular fistula arising from a right sinus of Valsalva (SoV) aneurysm. The authors are to be congratulated on the excellent visualization and technical success of the operation and for their expansion of their minimally invasive platform using endoscopic assistance via a right lateral thoracotomy approach.[1]

The anatomic location of the fistula in their report is consistent with historical reports of the right SoV communicating most commonly with the right ventricle.[1,2] In addition to the etiology presented, similar fistulas have occurred as a complication of transcatheter aortic valve replacement.[3] Although percutaneous closure of aortic root fistulas as a complication of transcatheter aortic valve replacement and SoV aneurysms have been attempted,[4] surgical repair will often be warranted. This is especially important for young and otherwise stable patients. Repair is dependent on excellent visualization of the aortic root and an intimate knowledge of the adjacent anatomic relationships.

The principles of clear visualization apply to the platform of techniques used in minimally invasive aortic valve replacement (AVR), regardless of whether the operation is completed under direct vision via ministernotomy (MS) or right anterior thoracotomy (RAT). Miceli and colleagues[5] have further demonstrated lower overall morbidity with RAT than with MS. A recent meta-analysis of 6 studies comparing the MS and RAT approaches found a reduced hospital length of stay for the RAT group but no difference in mortality.[6] Although the RAT and MS approaches are both reproducible approaches for AVR, RAT might often require transection of the second or third rib at the costochondral junction and division of the right internal mammary artery and vein to facilitate appropriate direct visual exposure. This could require rib fixation on closure.

Minimally invasive approaches to the mitral valve (MV) are performed more laterally, usually in the fourth intercostal space and with the incision generally centered just anterior to the mid-axillary line. Exposure via this approach does not require rib transection. Minimally invasive MV surgery has often been facilitated by 3-dimensional endoscopic assistance, with or without robotic telemanipulation. Fukumoto and colleagues[1] have elegantly illustrated how this lateral approach can provide excellent visualization to clearly see the necessary pathology and the aortic valve using endoscopic assistance and shafted instruments. We have completed well over 500 robotic MV operations using the robotic platform. Building on that experience, we have now performed robotic-assisted AVR using exactly the same approach used for MV surgery, the only exception being that the fourth intercostal incision is oriented ~1 to 2 cm more anteriorly for AVR. In our experience, the robotic platform provides superior optics and improved range of motion to clearly visualize pathology.

As experience in minimally invasive cardiac surgery continues to increase, the types of cases that can be accomplished will certainly expand—as long as the visualization remains optimal for safety and efficacy. The excellent technical report by Fukumoto and colleagues[1] is further evidence of that premise.

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