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## Commentary: Novel and innovative operative techniques continue to evolve

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Novel technology and new techniques are always of interest to cardiac surgeons. Double valve (aortic and mitral valves replacement) remains a complex cardiac operation with significant risks of mortality and morbidity. To date, a reliable minimal access approach has not been developed.

However, balloon-expandable valve prosthesis, hybrid catheterization laboratory/operating room suites, and a less-invasive robotic-assisted valve approach provide the opportunity for new approaches to reduce risks of mortality and morbidity and to shorten the recovery period after multiple valve-replacement procedures.

In this issue of *JTCVS Techniques*, Felmly and colleagues<sup>1</sup> publish their Techniques article titled “Hybrid Double-Valve Replacement.” The patient had calcific aortic stenosis and mitral stenosis with severe mitral annular calcifications (MACs). The patient needed a double valve (aortic and mitral), but the severe MAC presented significant increased technical complexity and mortality/morbidity.

In the case report, this 84-year-old woman was operated on in a hybrid room. The mitral valve was accessed with a robotic-assisted deployment of a balloon-expandable valve in the mitral position during cardioplegic arrest. The valve size was measured by computed tomography scan preoperatively.

The A-2 segment of the anterior leaflet was excised to prevent left ventricular anterior flow obstruction. Felt strips were used to augment the annular landing zone to minimize perivalvular leak. A 26-mm SAPIEN S3 valve was balloon expanded.

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### CENTRAL MESSAGE

Minimally invasive robotic-assisted MV surgery in a hybrid room provides the opportunity to replace the mitral and aortic valve using a technique with the potential to lower risks and complications.

With the patient remaining on cardiopulmonary bypass but with the heart beating, a 26-mm CoreValve Evolut R was delivered via the femoral artery to perform the aortic valve replacement. The clinical and postoperative recovery was uneventful.

This report should stimulate our creative desire to devise new but safe and effective operative procedures with rapidly evolving percutaneous valve technology and delivery systems. The robotic platform for mitral valve surgery provides excellent visualization of the mitral valve, enabling the MAC annulus to be prepared with felt reinforcement and anterior leaflet resection. Three major issues are as follows: (1) perivalvular leak, (2) left ventricular outflow tract obstruction, and (3) secure fixation are solved. Then, taking advantage of the imaging in the hybrid room, aortic valve replacement can be safely performed with the patient on cardiopulmonary bypass. The advantage of a single setting to perform the entire procedure is great.

The heart valve team should identify potential patients. The presence of a hybrid room is essential. The surgical technical capability of transcatheter aortic valve replacement and robotic port access mitral surgery are all essential ingredients to optimize the success of this approach. These patients should be followed closely to ensure we are actually improving surgical care and optimizing outcomes.

### Reference

1. Felmly LM, Johnson SD, Steinberg D, Katz MR. Hybrid double-valve replacement. *J Thorac Cardiovasc Surg Tech.* 2020;2:36-7.