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Commentary: MAC attack

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Mitral surgery with mitral annular calcification (MAC) is an ordeal for cardiac surgeons. Various techniques, including extensive or minimal decalcification, partial preservation of MAC, or extra-anatomical bypass, have been described, although the results have shown consistently high operative mortality.¹ A report from the Society of Thoracic Surgeons Adult Cardiac Database study showed that the presence of MAC was associated with greater operative mortality with an odds ratio of 1.28.² In this edition of the *Journal*, Smith and his group³ reported a 2-institution series of transatrial balloon-expandable-valve (BEV) in MAC as a new approach for improved outcomes.

A total of 51 patients were treated with transatrial BEV-in-MAC from 2015 to 2020. These were high-risk patients with a mean age of 73.9 years and a mean Society of Thoracic Surgeons score of 6.8%. Nearly 75% were treated using a minimally invasive approach; 41.2% had concomitant septal myectomy with high technical success (94.1%). The authors should be congratulated for their pioneering work in this field.

As the authors state in the discussion, transatrial BEV-in-MAC can overcome the most significant limitations of the percutaneous transseptal approach, namely left ventricular outflow tract (LVOT) obstruction, by resecting the anterior leaflet and interventricular septum. The LAMPOON (laceration of the anterior mitral leaflet to prevent left ventricular outflow tract obstruction) technique or pre-emptive alcohol septal ablation may be used as an adjunct to the transseptal approach, although these are for advanced operators/centers and the risk of LVOT

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CENTRAL MESSAGE

Mitral annular calcification imposes high risk for open mitral valve surgery. Transatrial BEV-MAC provides a new alternative solution to otherwise prohibitive-risk patients.

obstruction is not nullified. Furthermore, transatrial BEV-in-MAC allows treating large annulus or incomplete MAC with suture anchoring that cannot be treated with a transseptal approach.

In contrast, 30-day and 1-year mortality in this series remained relatively high (13.7%, 33.3%, respectively), although improving compared with the earlier series.⁴ Moreover, there was no improvement in the quality-of-life measures, and the capacity of 6-minute walk test diminished postoperatively. These results are partly due to the inherent risk of these patients with MAC and show the importance of careful patient selection. The patient must tolerate not only cardiopulmonary bypass but also be non-rail to recover from the surgical invasiveness, and there must be continued effort to identify the right population to offer this surgery. In addition, the question of operator qualification exists, given the learning curve and the small number of cases. Should these procedures be accumulated to a center of excellence, or could the technique be disseminated to all cardiac surgeons?

New technology provides new solutions. Transatrial BEV-in-MAC provides an elegant solution using a true hybrid technique to what is known as a difficult problem. There are currently clinical trials enrolling patients with MAC for transapical/septal transcatheter mitral valve replacement devices, but the LVOT obstruction risk remains. With careful patient selection and technique, this procedure will continue to have a role and should be in the surgeon and heart team's armamentarium.

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References

1. Bedeir K, Kaneko T, Aranki S. Current and evolving strategies in the management of severe mitral annular calcification. *J Thorac Cardiovasc Surg.* 2019;157:555-66.
2. Kaneko T, Hirji S, Percy E, Aranki S, McGurk S, Body S, et al. Characterizing risks associated with mitral annular calcification in mitral valve replacement. *Ann Thorac Surg.* 2019;108:1761-7.
3. Smith R, Hamandi M, Ailawadi G, George T, Mack M, DiMaio J, et al. Surgical implantation of balloon-expandable heart valves for the treatment of mitral annular calcification. *J Thorac Cardiovasc Surg.* August 25, 2021 [Epub ahead of print].
4. Praz F, Khaliq OK, Lee R, Veeragandham R, Russell H, Guerrero M, et al. Transcatheter implantation of a transcatheter heart valve for severe mitral annular calcification. *J Thorac Cardiovasc Surg.* 2018;156:132-42.