

EDITORIAL COMMENT

Up-to-Date Clinical Practice of Transcatheter Edge-to-Edge Repair in Asia



Challenges and Opportunities*

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Valvular heart disease (VHD) is a rapidly escalating and significant public health concern. Among VHD types, mitral regurgitation (MR) stands as the most prevalent one, and its incidence rises notably with age.¹ Untreated severe MR is strongly associated with a heightened risk of cardiovascular mortality and hospitalization due to heart failure. Various clinical trials have shown that intervention can significantly improve the survival and functional capacity of patients with MR. However, the global intervention rate for MR has not experienced the same explosive growth as transcatheter aortic valve replacement.² Asia may exhibit an even lower rate of MR interventions. In the China-DVD (China Elderly Valve Disease) study, conducted by Xu et al,³ it was found that only 32% of symptomatic patients with severe MR underwent valve interventions. The primary reasons for denial were attributed to the high operative risk, concerns surrounding thoracotomy complications, cultural reservations towards open-heart surgery, and economic factors.

Severe degenerative MR is traditionally managed through surgical means. However, this approach presents formidable challenges for patients at high or prohibitive risk due to advanced age and multiple comorbidities. Transcatheter edge-to-edge repair (TEER) has emerged as a viable option for patients

with degenerative MR who are considered high surgical risk or who have functional mitral regurgitation despite guideline-directed medical therapy. As of now, TEER with the MitraClip system (Abbott) has been performed in more than 180,000 patients worldwide,⁴ and several large registries in the United States and Europe have validated its efficacy and safety.

In this issue of *JACC: Asia*, Saji et al⁵ present their findings on the Japanese experience with TEER from the OCEAN (Optimized CathETER vAlvular iNtervention)-Mitral registry. A total of 2,150 patients were enrolled between April 2018 and June 2021, of whom 1,605 patients (75.0%) presented with secondary MR. Patients treated with the TEER G4 system (n = 618) experienced significantly shorter procedure times compared to those treated with the TEER G2 system (n = 1,532). Most patients (95.2%) achieved MR reduction to 2+ or less, and 71.7% attained an MR severity rating of 1+ or less at the 30-day follow-up across all patient subgroups. Interestingly, the acute procedural success rate of the G2 system (94.7%) was greater than that previously reported in large international registries, whereas that of the G4 system (94.6%) was slightly lower compared with previous data (98.3%).⁶ Matsumoto et al⁷ tentatively demonstrated the safety and efficacy of TEER in Asia; however, the data for TEER with the G4 system were limited.^{8,9} The findings from this study confirm previously published TEER data from Western countries, implying an excellent acute procedural success rate in the TEER system especially G4 system in Asian patients.

The TEER G4 device offers several notable improvements over the G2 model, including wider clip sizes, independent leaflet grasping, improved arm designs to reduce leaflets stress, and real-time left atrial pressure monitoring during the procedure.

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These advancements empower operators to address challenging anatomies and broaden the scope of TEER. However, in the study conducted by Saji et al,⁵ the rate of MR severity of 2+ or less on discharge echocardiograms was slightly lower compared to previous data, possibly attributed to the smaller annulus diameters and left atria of Asian individuals, which pose unique challenges for repairs, especially in complex cases.¹⁰ This can be flanked by the device selection. Chakravarty et al⁶ reported that more than 80% of the cases used the wide clip (NTW or XTW), whereas only 56.0% of patients received a wide clip in Japan. Additionally, the use of XTW clips in Japan was significantly lower than in previous studies (7.4% vs 25%).¹¹

Another novelty of Saji et al⁵ study was that 419 (26.1%) patients with atrial functional mitral regurgitation (AFMR). Because of differences across studies in patient selection, methods, and definition of AFMR, the prevalence, pathophysiology, prognostic implications, and potential therapy of AFMR are less clear.¹² However, it is indisputable that AFMR constitutes an under-recognized high-risk group, with significant comorbidities, limited therapeutic options, and poor outcomes.¹³ Surprisingly, the prevalence of AFMR in Japan seems to be significantly higher than previously reported, reflecting the specific epidemiological characteristics of MR populations in Asia.¹⁴ Consequently, the Asian population has distinct mitral valve anatomy and a high burden of secondary MR. Long-term follow-up results

and further subgroup analyses of the OCEAN-Mitral registry are eagerly anticipated.

In summary, Saji et al⁵ present the most extensive experience to date of TEER in Asia and provide preliminary validation of the safety and efficacy of the G4 device. As the largest continent with a population exceeding 4 billion people, Asia's population may have unique and complex valve anatomy, as well as specific epidemiological characteristics. Additionally, Asia has unique cultural reservations towards invasive procedures. Despite being at intermediate or low surgical risk, many Asian patients strongly resist open-heart surgery, preferring to endure a suboptimal quality of life. This preference poses challenges in managing their conditions. As TEER indications continue to expand and clinical research explores its potential, TEER is poised to break new boundaries and emerge as a mainstream approach to treating MR in Asia, but it will also bring forth more complex challenges.

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