



Optimal mode of aortic valve replacement in patients with chronic obstructive pulmonary disease-which helps patients gain more benefit?

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Comment on: Ando T, Adegala O, Akintoye E, *et al.* Is Transcatheter Aortic Valve Replacement Better Than Surgical Aortic Valve Replacement in Patients With Chronic Obstructive Pulmonary Disease? A Nationwide Inpatient Sample Analysis. *J Am Heart Assoc* 2018;7.

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Chronic obstructive pulmonary disease (COPD) is highly prevalent in patients with severe aortic stenosis who are candidates for aortic valve replacement. As patients with COPD is generally characterized as a high-risk population for surgical aortic valve replacement (SAVR), transcatheter aortic valve replacement (TAVR) is preferred for these patients because it is considered less invasive. Therefore, there is often a relatively high proportion of COPD patients in large TAVR registries, ranging from 14% to 43% (1). However, whether COPD patients benefit more from TAVR than SAVR remain to be demonstrated by data from large sample size.

Recently, Ando *et al.* (2) reported a study comparing COPD patients undergoing TAVR and SAVR using propensity-matched analysis method. The authors should be congratulated for elucidating this important issue by using a nationwide database. An important endpoint reported in this study is respiratory-related complications which is of particular interest in patients with COPD. And they found respiratory-related complications were significantly less frequent with TAVR compared to SAVR. Besides, some non-respiratory-related complications (such as in-hospital mortality, bleeding requiring transfusion, acute kidney injury and acute myocardial infarction) were also significantly less frequent with TAVR than SAVR, as in

unselected patients. This was similar to the result of prior large randomized controlled trials in high-risk patients (3,4). Finally, they found cost and hospital stay were also more favorable with TAVR than SAVR. Prior study has suggested that periprocedural complications are associated with increased TAVR cost (5). With the evolvement of TAVR technique since this study, periprocedural complications rate has been decreased. Thus, we have reason to believe TAVR would be a more cost-effective treatment for these patients.

Although there are some limitations in the study, as have been discussed by the author, this study demonstrated that in COPD patients with high surgical risk TAVR should be the first-line choice. However, in COPD patients with intermediate surgical risk, whether TAVR should be a preferable choice is unknown. With the emerging evidence to support the application of TAVR in intermediate-risk patients (6), this problem should be further clarified.

Patients in this study were included from 2011–2014 when TAVR was mainly performed with general anesthesia. Recently, standard TAVR has developed towards a less invasive procedure (minimalist TAVR) which could be performed under local anesthesia without endotracheal intubation. Prior study has suggested that minimalist TAVR is associated with improved 1-year survival compared to standard TAVR in patients with severe COPD (7).

Therefore, minimalist TAVR may be a more favorable treatment for these patients.

Although TAVR was better than SAVR in terms of periprocedural complications, it should be noted that there is still a high in-hospital mortality in TAVR group (3.3%). Prior studies have identified that COPD not only impaired short-term survival but also was associated with increased long-term all-cause mortality after TAVR (1). Therefore, the clinical management for this subset of patients remains an important issue. For example, optimization pulmonary function before TAVR as before cardiac surgery potentially is helpful, but it needs to be further investigated.

In conclusion, as the authors presented, in high-risk patients with COPD, TAVR should be the first-line choice. However, whether it is the same situation for lower surgical risk patients is unknown. As TAVR procedure becomes less invasive, COPD patients may have more benefit from minimalist TAVR. Finally, clinical management for COPD patients undergoing TAVR needs further investigation.

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Footnote

Conflicts of Interest: Dr. Chen is consultant and proctor for Venus MedTech and MicroPort. The other authors have no conflicts of interest to declare.

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