

Invited Commentary

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Dealing with concomitant coronary artery disease in TAVI patients—should we treat it all in one go?

Concomitant coronary artery disease (CAD) in patients with severe aortic valve stenosis is not uncommon, and its presence may have a prognostic adverse effect on clinical outcomes of patients undergoing transcatheter aortic valve implantation (TAVI).^{1,2} In line with recommendations on the treatment of concomitant CAD in patients undergoing conventional surgical aortic valve replacement, international guidelines suggest that revascularization of proximal segments should be performed before TAVI.³ This recommendation could be partially ascribed to concerns of the risk of severe periprocedural myocardial injury in patients with unrevascularized concomitant CAD at the time of TAVI.⁴ In addition, some interventionalists prefer percutaneous coronary intervention (PCI) before TAVI, as coronary access may be technically challenging afterwards. Interestingly, to date there are no large-scale randomized clinical trials to inform us about either the necessity for or the optimal timing of PCI.⁵

In this issue of *BUMC Proceedings*, Park and colleagues describe the impact of same-admission PCI on in-hospital outcomes in patients undergoing TAVI.⁶ They analyzed more than 170,000 TAVI hospitalizations using the National Inpatient Sample and estimated that 2.6% of patients undergoing TAVI between 2016 and 2019 underwent PCI during the same hospital admission. Propensity-score matching was performed to overcome important differences in patient and hospital characteristics, resulting in the comparison of 4425 patients undergoing TAVI with and without PCI during the hospital stay. Whereas in-hospital mortality was similar for both groups, the incidence of cardiac arrest, cardiogenic shock, and acute myocardial infarction was higher in patients undergoing PCI during the same admission. As discussed by Park and colleagues, it may well be that patients requiring both PCI and TAVI reflect a high-risk group and prognosis is not determined by the presence of CAD. There are a number of important inherent limitations for the analysis, as the data from the National Inpatient Sample lack granularity regarding coronary anatomy, lesion location, and plaque characteristics. Moreover, it is conceivable that some patients may have undergone PCI as a result of coronary occlusion after valve implantation, rather than PCI for preexistent CAD. Once again, this study exposes two important gaps in current

scientific evidence that are frequently discussed by multidisciplinary heart teams: should we pursue PCI in these patients, and if so, what is the optimal timing of PCI?

First of all, the effect of revascularization in patients undergoing TAVI is still to be elucidated. Concomitant CAD in the elderly TAVI patient is frequently characterized by multivessel disease and highly calcified lesions requiring advanced techniques such as coronary atherectomy and intravascular lithotripsy.² These anatomical features, combined with a plethora of comorbidities among patients planned to undergo TAVI, lead to an increased risk of complications during PCI. Moreover, the inevitable use of dual antiplatelet therapy afterwards is also associated with higher rates of bleeding complications in patients undergoing TAVI, significantly affecting clinical outcomes of the frail TAVI patient as recently shown.⁷ Results from studies such as ISCHEMIA and COURAGE also support a more conservative approach in patients with stable concomitant CAD. Park and colleagues confirmed this to some extent, as they found that same-admission PCI was not associated with an improvement in clinical outcomes among patients undergoing TAVI. Importantly, a recent observational study comparing various revascularization strategies in patients undergoing TAVI concluded that patients undergoing PCI and TAVI in one session had higher rates of mortality compared to patients treated with other revascularization strategies.⁸

Nevertheless, results from studies using propensity-score matching are inherently still affected by treatment bias. Therefore, data from well-organized randomized trials are warranted to help heart teams decide on the optimal strategy in patients with both severe aortic valve stenosis and significant CAD. Results from trials on the necessity of PCI before TAVI (PRO-TAVI NCT05078619 and NOTION-3 NCT03058627) as well as on the optimal timing of PCI (TAVI-PCI NCT04310046) are expected in the next couple of years and will contribute to the continuous improvement of periprocedural and long-term outcomes of patients undergoing TAVI.

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