



## Editorial

## Prophylactic Pacemaker Implant in Patients Undergoing Transaortic Valve Replacement: Is Right Bundle Branch Block Enough?\*

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Transcatheter aortic valve replacement (TAVR) has evolved to become the mainstay therapy for patients with severe aortic stenosis, and its utility is no longer limited to high-surgical-risk patients.<sup>1,2</sup> Procedural safety and duration have improved such that TAVR requires significantly shorter duration of hospitalization, and in the postpandemic era, TAVR can be safely performed with same-day discharge.<sup>3</sup>

A common complication of TAVR that can prolong hospital stay and increase mortality risk is high-grade or complete atrioventricular (AV) block that requires a permanent pacemaker implant. Patients with baseline right bundle branch block (RBBB) are known to be at higher risk of high-grade or complete AV block and have associated increased mortality. The mechanism seems intuitive based on dependency on the left bundle, which is at risk for injury during the TAVR procedure, but there is no consensus on preprocedural management approach for patients with baseline RBBB undergoing TAVR.

In this issue, Zorman et al. retrospectively studied the outcomes of 170 patients with baseline RBBB undergoing TAVR across two high-volume centers in the United Kingdom. They evaluated the safety and efficacy of prophylactic pacemaker implants in 106 of these patients and compared outcomes with the 64 patients who did not receive a prophylactic pacemaker. Patients who received a prophylactic pacemaker had a significantly shorter hospital stay compared to patients who did not receive a prophylactic pacemaker. Of the 64 patients who did not receive a prophylactic pacemaker implant, 43 underwent urgent pacemaker insertion. Prophylactic pacemaker implant was not associated with an increase in pacing-related complication rate compared to the group requiring urgent pacemaker implant.

The authors also evaluated long-term pacing need over a period of 12 months and found that high pacing burden, which they defined as ventricular pacing greater than 10%, was observed in 63% of patients who had a prophylactic pacemaker. The authors identified that predictors of high pacing included peripheral vascular disease, atrial fibrillation, first-degree AV block, and QRS duration. Of these features, first-degree AV

block and QRS duration >140 ms were found to be independent predictors of high ventricular pacing.

This report by Zorman et al. adds to a growing body of literature that recognizes baseline RBBB as an independent strong predictor of post-TAVR pacemaker implant.<sup>4-6</sup> The study demonstrates that prophylactic pacemaker implantation in this clinical scenario is acutely safe and reduces hospital stay. Nonetheless, over 35% of patients who received a prophylactic pacemaker had <10% pacing in the first year after TAVR, highlighting that RBBB alone pre-TAVR may not have enough specificity to predict chronic pacing requirement.

Despite the significant association between baseline RBBB and post-TAVR complications, prophylactic pacemaker implantation in this patient population has not been shown to improve long-term survival,<sup>7</sup> possibly because the benefit of avoiding sudden cardiac death by AV block is offset by the deleterious effects of chronic right ventricular pacing. In addition, prior data from the Japanese OCEAN-TAVI (Optimized trans-Catheter aValvular iNtervention) registry showed that while patients with RBBB and without pacemakers had higher risk for early mortality after TAVR, those with RBBB and pacemakers had increased cardiovascular mortality at mid-term follow-up, defined as after 1 year.<sup>8</sup> As such, the 2020 ACC Expert Consensus document for managing conduction disorders in patients undergoing TAVR did not support prophylactic pacemaker implants, deferring the decision for pacemaker to the post-TAVR setting.<sup>9</sup>

While the present study does not provide survival data and long-term outcomes beyond 1 year, it is the largest retrospective cohort to date and offers a number of suggestions for future prospective randomized studies, such as risk stratification among patients with baseline RBBB, using for instance, PR and QRS intervals, and evaluating the timing of prophylactic pacemaker implant. Long-term considerations, such as lead complications, infection risk, heart failure, and mortality, will also need to be explored. Novel pacing strategies, like leadless pacing and conduction system pacing, provide additional opportunities to treat patients undergoing TAVR who may be candidates for a prophylactic pacemaker implant.

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\* Due to administrative issues, both editorials invited and submitted and felt both worthy of publication.

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