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## Commentary: Pacemaker dependency after transcatheter aortic valve implantation: Only half as bad?

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### CENTRAL MESSAGE

Long-term pacemaker dependency after TAVI is lower than at discharge. More precise information needs to be generated.

Disturbance of atrioventricular conduction with atrioventricular block (AVB) is a known complication of aortic valve replacement. AVB requires permanent pacemaker implantation (PPI). Chronic ventricular stimulation has been associated with impairment of left ventricular function and increased mortality.<sup>1</sup> With the introduction of TAVI, it became obvious that the incidence of AVB after TAVI is higher compared with surgical valve replacement. Not surprisingly, the need for PPI has been associated with decreased survival also after TAVI.<sup>2,3</sup>

Thus, in differential decision making between TAVI and conventional surgery, the need for PPI should be taken into consideration. This requires precise information; for example, whether all patients who require PPI after TAVI will automatically be exposed to chronic ventricular stimulation.

In this new meta-analysis,<sup>4</sup> the authors screened 801 publications and analyzed 23 to determine the incidence of pacemaker dependency at 1 year after TAVI. They confirmed previous reports that found self-expanding TAVIs and preinterventional right bundle branch block were associated with an increased risk of AVB. Only 50% of patients who had undergone PPI after TAVI were not pacemaker-dependent at 1 year after implantation.

The obvious conclusion is that truly persistent AVB after TAVI may not be as common as generally assumed. As

such, the results echo early findings regarding reversibility of AVB after TAVI.<sup>5</sup> The article raises questions that should be considered before accepting the evidence as clear:

- Less than 3% of the existing reports were included in the analysis for methodological reasons, so it is unclear whether the results can be generalized;
- Studies were excluded if there was evidence of congenital pathology and it is unclear whether this included bicuspid aortic valves;
- Pacemaker dependency was not uniformly defined in the studies and determined at inconsistent time intervals;
- Intermittent pacemaker dependency may have evaded the search and analysis; and
- The indication for PPI was heterogeneous and included second-degree AVB, sick sinus syndrome, or bradycardic atrial fibrillation (ie, conditions that are known to be reversible).

Although the results are similar to earlier observations,<sup>5</sup> the true incidence of complete AVB and its subsequent course and potential recovery could not be determined. Finally, information on heart rhythm was apparently only available for the surviving patients. It remains unknown how many individuals with pacemaker dependency died before the determination of heart rhythm, thus leading to systematic underestimation of pacemaker dependency and its prognostic effect. In addition, the induction of a left bundle branch block with its prognostic implications was not included in the study.<sup>6</sup>

The positive message of this article is that atrioventricular conduction can recover after TAVI. This parallels observations in which even complete AVB can recover after

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surgical aortic valve replacement.<sup>7</sup> This fact should stimulate research into the time course of atrioventricular conduction disturbance after both interventional and surgical aortic valve interventions. The information will help to improve results and better individualize the indication for PPI and minimize pacemaker-associated morbidity and mortality.

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