Electrocardiographic Monitoring Following Transcatheter Aortic Valve Replacement
Do We Need to and for How Long?*

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The introduction of transcatheter aortic valve replacement (TAVR) has been a major landmark in the treatment of aortic stenosis. Although current clinical practice guidelines recommend TAVR in patients at high or prohibitive surgical risk, its use is already expanding toward the treatment of lower-risk patients (1). However, concerns have been raised about the cost effectiveness of TAVR in intermediate-risk patients, mainly due to the high costs of transcatheter valve systems (2). Efforts to reduce the overall costs of TAVR have focused on decreasing the length of hospital stay and using minimally invasive procedures. Preliminary studies on early discharge (≤3 days) post-TAVR have suggested the safety of such strategy (3,4), as well as its possible association with an overall reduction of peri-procedural costs (5).

The occurrence of conduction disturbances, which remain the most frequent complication of TAVR (6), may jeopardize the implementation of a minimalist TAVR approach including early discharge post-procedure. Some of these abnormalities occur late (within days) after TAVR and, in fact, up to 72 h of continuous electrocardiography (ECG) monitoring post-procedure is currently recommended in order to detect late arrhythmic events (7). Nonetheless, no strong evidence supports this cutoff value and the minimum duration of continuous ECG monitoring required after TAVR remains largely unknown.

In this issue of JACC: Cardiovascular Interventions, Toggweiler et al. (8) propose a new algorithm to determine the duration ECG monitoring after TAVR. The authors evaluated the incidence and predictors of delayed (post-procedural) high-degree atrioventricular block (AVB) following TAVR in a cohort of 1,064 patients without prior permanent pacemaker. Both balloon and self-expandable devices were used. Delayed high-degree AVB occurred in 71 patients (6.7%) up to 8 days after the procedure, and was more frequently observed in men (adjusted odds ratio: 2.41; 95% confidence interval: 1.3 to 4.5) and in patients with conduction disorders (left or right bundle branch blocks [BBB]) on the ECG immediately post-TAVR (odds ratio: 10.8; 95% confidence interval: 4.6 to 25.5). A total of 250 patients (24% of the study population) were in sinus rhythm with no BBB, first-degree AVB, or bradycardia on the ECG performed immediately post-TAVR, and none of them developed delayed high-degree AVB. One of these patients (0.4%) required permanent pacemaker implantation before hospital discharge for other reason than AVB. In addition, delayed high-degree AVB occurred only in 1 of the 103 patients (1.0%) with atrial fibrillation (AF) and no BBB and no bradycardia post-procedure. Overall, the presence of conduction disorders (BBB, first-degree AVB, or bradycardia in patients with AF) on the ECG post-TAVI had very high sensitivity (99%) and negative predictive value (99.7%) for the occurrence of delayed high-degree AVB. Furthermore, no delayed high-degree AVB occurred in patients with a stable ECG for 2 days.

Based on such results, the authors concluded that: 1) temporary pacemaker wires or continuous ECG monitoring would not be necessary in patients with
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...patterns regarding the evolution of conduction disorders over time. Thus, whether delayed conduction disorders may occur in patients with no conduction abnormalities immediately after TAVR when using such devices remains unknown. Third, the percentage of patients with sinus rhythm, no BBB, and no AVB immediately after the procedure was small (one-fourth of the study population). These results would therefore apply only to a minority of TAVR patients. Also, the results obtained in such a limited study population would need confirmation in a much larger number of patients.

Fourth, while the risk of delayed AVB in patients with AF and no bradycardia or conduction abnormalities post-TAVR was very low in this study, changes in medical treatment in such patients may have an impact on the occurrence of late conduction disorders. Finally, the recommendation of continuous ECG monitoring post-TAVR is not only for detecting bradyarrhythmias but also for diagnosing tachyarrhythmias, particularly AF, which are very frequent post-TAVR and may increase the risk of potentially preventable cardioembolic events (14).

The predictors of AVB and pacemaker implantation after TAVR have been extensively reported in previous studies (15). Nonetheless, most such studies have assessed baseline clinical and ECG factors associated with an increased risk of AVB post-TAVR. The study of Togweiler et al. (8) has the originality of assessing the predictors of delayed AVB (rather than overall procedural and post-procedural AVB), and importantly, have determined the extremely low risk of delayed high-degree AVB in the absence of such predictive variables. This provides the rationale for a new and simplified perspective on the management of rhythm monitoring after TAVR. However, important questions remain unsolved and further research is needed in this field before making definite conclusions. While minimizing the post-procedural care burden and reducing the length of hospital stay are important objectives in TAVR, this should never be at the expense of decreasing safety.

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