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Commentary: Similar rhythm disturbance profiles of rapid-deployment aortic valve bioprostheses

Ahmet Ruchan Akar, MD, FRCS CTh, and Mustafa Bahadır Inan, MD

The goal of heart valve centers in the treatment of valvular heart disease is to deliver optimal quality of care with a patient-centered approach.¹ In terms of a patient-centered approach, rapid deployment and sutureless aortic valve replacement (AVR) have become a focus of interest in the surgical community in the last 2 decades. Excellent safety profiles, ease of implantation, reduced procedural time, hemodynamic performance, and reproducibility made these valves excellent alternatives to both traditional aortic prosthesis and transcatheter aortic valves. However, increased postoperative conduction disturbances and the need for permanent pacemaker (PPM) implantation are significant concerns for transcatheter, sutureless, and rapid-deployment technologies.²⁻⁴

Thuraisingam and Newcomb⁵ performed a case series of 100 consecutive patients who underwent rapid-deployment AVR with Edwards Intuity Elite valve at St Vincent's Hospital Melbourne from 2013 to 2017. They aimed to examine electrocardiogram (ECG) changes, conduction abnormalities, and rates of pacemaker implantation in this cohort. Three patients were excluded from the study for the preoperative pacemaker requirement, leaving 97 patients for final analysis. The authors analyzed 12-lead ECGs at 3 time points: preoperative, 5 days' postoperative, and follow-up at 6 weeks. A total of 14 patients (14.4%) had a PPM

From the Department of Cardiovascular Surgery, Heart Center, Cebeci Hospitals, Ankara University School of Medicine, Ankara, Turkey.

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Address for reprints: Ahmet Ruchan Akar, MD, FRCS CTh, Department of Cardiovascular Surgery, Heart Center, Ankara University School of Medicine, Dikimevi, Ankara, 06340 Turkey (E-mail: akarruchan@gmail.com).

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CENTRAL MESSAGE

RDAVR has been associated with increased rates of PPM compared to conventional AVR. Appropriate matching and careful attention to bioprosthesis-specific technical details may reduce this complication.

implanted at an average of 11.1 ± 2.9 days postoperatively. The authors analyzed heart rate, PR, QRS, and cQT conduction intervals for recipients of PPM ($n = 14$) compared with nonrecipients ($n = 83$). A new-onset (18.6%) but transient left bundle branch block (LBBB) at postoperative day 5 was detected. However, only 4.1% of patients had persistent LBBB at 6-week follow-up. The authors concluded that widened QRS complex might predispose to PPM requirement in the rapid-deployment AVR setting, and new-onset LBBB may resolve over time. The results are consistent with the recently published series.² Changing characteristics of conduction disorders over time is clinically relevant. Potential causes include excessive oversizing, intra-annular placement, expandable property with radial force, inflammation, edema, ischemia of the surrounding tissue, subannular skirt of the prosthesis within the left ventricular outflow tract, and compression to the conduction system should all be taken into account in terms of surgical technique.

Overall strengths of the article are precise aim, justified research question, relevant results, impressive series of this new procedure, well-described surgical technique, and the literature review. Overall weaknesses of the article, as mentioned in the limitations, are retrospective single-center study design, 3-time point ECG methodology, limited follow-up of 6 weeks, and concomitant procedures, which may affect the rhythm status.

In brief, the case series⁵ encourages the use of rapid-deployment and sutureless aortic bioprostheses with careful case selection. The authors must be congratulated for challenging research question, data processing, and efforts to prevent PPM. A large-scale randomized comparison is still warranted.

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