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Commentary: Is the need for permanent pacemaker after aortic valve replacement such a big deal?

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CENTRAL MESSAGE

Permanent pacemaker implantation after aortic valve replacement is associated with significant morbidity. Chronicity of rhythm disturbances and optimal timing of pacemaker insertion remain unclear.

Sutureless and rapid deployment aortic valve replacement (SURD-AVR) has emerged over the past few decades, offering a middle ground between transcatheter AVR (TAVR) and conventional surgical AVR (SAVR). Through a standard surgical approach, these valves are implanted with only 3 guiding sutures, allowing for reduced crossclamp and cardiopulmonary bypass times, while also providing excellent hemodynamic parameters.^{1,2} The Intuity Elite Valve (IEV) (Edwards Lifesciences, Irvine, Calif) is a rapid deployment valve fixed in the subannular region. As such, the risk of conduction abnormalities potentially requiring permanent pacemaker (PPM) implantation is expected to be higher than with SAVR. Yet, some studies have found that risk of PPM is not significantly associated with type of valve prosthesis. Rather, preoperative conduction disturbances were found to be predictive of PPM need. SURD-AVR was, however, associated with a greater incidence of new-onset left bundle branch block (LBBB) when compared with SAVR.^{3,4}

Thuraisingam and Newcomb⁵ evaluate rhythm disturbances and conduction abnormalities following IEV implantation by comparing postoperative electrocardiographs (EKGs) to baseline. Only 60% of patients were in normal

sinus rhythm without conduction abnormalities preoperatively. Roughly 18% of patients had developed new LBBB at postoperative day 5, with only 4% persisting at week 6. Widened QRS complex at postoperative day 5 was found to be associated with PPM need. Of the 97 patients, 14 (14.4%) required a permanent pacemaker, but none were in a paced rhythm at 6 weeks. Only half of the patients requiring PPM had an isolated rapid-deployment AVR (RDAVR), whereas the other half had concomitant procedures.

The topic of this study is highly relevant because interest in pacemaker dependency has resurfaced with the rise of TAVR and SURD-AVR. The need for postoperative PPM is significant because of the associated risks of device malfunction, infection, tricuspid regurgitation, heart failure, and thrombotic events.⁶ Furthermore, the current evidence shows an apparent increase in mortality among TAVR patients who develop a new-onset LBBB and require PPM implantation postoperatively.⁷ The authors review the relevant literature, describe their methods of IEV implantation, and offer an explanation for the rate of conduction abnormalities seen after RDAVR. Their findings raise pertinent questions regarding the transient versus persistent nature of conduction abnormalities after RDAVR, as well as the optimal timing of PPM implantation. However, long-term follow-up data are needed to answer these questions and are unfortunately lacking in this study.

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In fact, follow-up only consisted of spot EKGs at 2 isolated time points, limiting insight on emergence and persistence of rhythm disturbances following SURD-AVR. The study is also limited by its retrospective single-center, single-surgeon design and small sample size. Larger studies with longer follow-up and more frequent evaluation of rhythm over time are warranted. Such studies would provide a clearer understanding of EKG changes in patients undergoing SURD-AVR, along with an understanding of how these changes may intersect with pacemaker need, both in the short- and long-term. PPM after AVR is not without consequences⁸; therefore, we cannot minimize the potential need for PPM after any aortic valve intervention.

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