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Commentary: How many doctors does it take to change a lightbulb?

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Readers of the *Journal* will find interest in this study by Shivamurthy and colleagues.¹ The study addresses the feasibility of directly inserting a leadless pacemaker during isolated or concomitant tricuspid valve operation. The authors have done a good job describing the technical considerations about device insertion. Using their technique, all leadless pacemakers were successfully inserted in less than 5 minutes. The process seems relatively straightforward.

Marai and colleagues² reported the first case of successful intraoperative implantation of a leadless pacemaker during valve surgery. Shivamurthy and colleagues¹ have now added 15 more cases to the literature. In all patients, there have been no reported procedural complications, and it seems that pacing impedance, sensing amplitudes, and pacemaker function have been normal during short-term follow-up (151 ± 119 days). The literature corroborates a high rate of success implantation and low rate of acute complications.^{3,4}

In my opinion, the issue is not if pacemaker insertion can be done. The authors have demonstrated such. The main issue is whether pacemaker insertion should be done? This is where it becomes quite complex, which may explain why this study had 14 authors.

I note in this study (see their Figure 5) that 73% of the patients had a postoperative pacing burden of 0% to 10%. This raises the question: did those patients even need a pacemaker? Or was the pacemaker just an expensive contingency? The authors recognize the controversy. In the discussion section, they do not advocate for routine implantation of the leadless pacemaker at the time of cardiac surgery in patients without a pre-existing indication for pacing.

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CENTRAL MESSAGE

Leadless pacemaker implantation under direct visualization can be done safely during valve surgery. Further study is needed to determine who benefits from the technique.

I'm supportive of this technique in patients with a clear preoperative indication for pacemaker therapy such as atrial fibrillation with complete heart block. However, this type of patient was a rarity (7%) compared with the larger group of patients who might, but didn't, need pacing after valve surgery. It comes down to risk and benefit. And I would include cost in the risk-side of that analysis. Leadless pacemaker technology is expensive. A superfluous leadless pacemaker doesn't make financial sense, even if it obviates the need for temporary pacemaker wire implantation and early discharge.

Yes, you can safely and easily do leadless pacemaker implantation under direct visualization during valve surgery. Moving forward, the question is, should you do it? This explains my use of the light bulb metaphor in the title. Screwing in the light bulb is easy. Correctly deciding to change the lightbulb is where the apparent difficulty lies. Further study is warranted.

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