

See Article page 163.

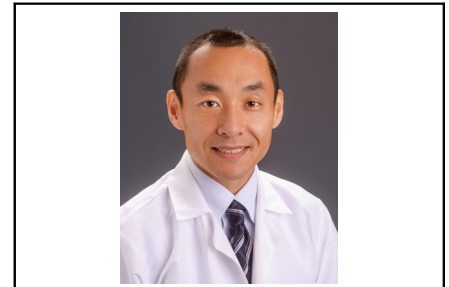


Commentary: Implantable or wearable cardioverter defibrillator after coronary artery bypass grafting in patients with left ventricular dysfunction?

Takashi Murashita, MD

Sudden cardiac death (SCD) is a well-known complication after coronary revascularization in patients with left ventricular dysfunction. Implantable cardioverter-defibrillator (ICD) therapy is associated with a reduction in the rate of death due to life-threatening ventricular arrhythmia (VA). The SCD rate could be greatest in the early period of revascularization. However, previous studies failed to show survival benefit of prophylactic implantation of ICD at the time of coronary artery bypass grafting (CABG)¹ or early after acute myocardial infarction.^{2,3} Therefore, a final decision on ICD implantation is typically deferred for 3 months after coronary revascularization.⁴

In this issue of the *Journal*, Nakae and colleagues⁵ reviewed 498 patients with ejection fraction <40% who underwent CABG and investigated the clinical impact of ICD placement on patients' postoperative survival. Ninety-nine patients (20%) developed postoperative VA; 46 symptomatic ventricular tachycardia (VT), 27 asymptomatic sustained VT, and 26 nonsustained VT. Of 99 patients who had postoperative VA, 55 patients received ICD; 28 received within 3 months of CABG, 27 received after 3 months of CABG, and no patient received concomitant ICD implantation at the time of CABG. Nakae and



Takashi Murashita, MD

CENTRAL MESSAGE

Further studies are needed to identify the optimal strategy for prevention of sudden cardiac death after coronary artery bypass grafting in patients with left ventricular dysfunction.

colleagues⁵ reported a survival benefit for patients with VAs who received ICD implantation.

Nakae and colleagues⁵ provide interesting and potentially useful information for cardiac surgeons and their co-workers who take care of patients with ischemic cardiomyopathy. However, there are still some unanswered questions regarding ICD implantation after CABG.

First, in this paper of Nakae and colleagues,⁵ approximately one-half of the patients underwent ICD within 3 months of the operation, which was more aggressive than guideline recommendations. Currently, a wearable cardioverter defibrillator (WCD) has been widely used to close the gap between coronary revascularization and ICD implantation. WCD could work as a bridge to left ventricular function improvement. Although the survival benefit of WCD after coronary revascularization was reported,^{6,7} there is no established evidence regarding the superiority of WCD over early ICD implantation (within 90 days).

Second, although Nakae and colleagues⁵ reported the clinical benefit of ICD implantation both in life-threatening VA and hemodynamically stable VA, whether the ICD implantation should be indicated to asymptomatic sustained VT or nonsustained VT is debatable. This study was a retrospective, multicenter study; therefore, a decision of ICD implantation was at the discretion of the heart team in each institute.

Third, the leading cause of death in this study was heart failure, which was followed by SCD. Neither ICD nor WCD

From the Department and Institution, Department of Surgery, University of Missouri, Columbia, Mo.

Disclosures: The author reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Nov 17, 2022; accepted for publication Nov 21, 2022; available ahead of print Dec 9, 2022.

Address for reprints: Takashi Murashita, MD, Division of Cardiothoracic Surgery, Department of Surgery, University of Missouri, One Hospital Dr, Columbia, MO 65212 (E-mail: murashitat@health.missouri.edu).

JTCVS Open 2023;13:176-7
2666-2736

Copyright © 2022 The Author(s). Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).
<https://doi.org/10.1016/j.jxjon.2022.11.006>

itself would improve the cardiac function. However, one can assume that cardiac resynchronization therapy defibrillator might provide a positive impact on patients' outcome by both improving cardiac function and preventing SCD. There is no established evidence of early application of cardiac resynchronization therapy defibrillator after coronary revascularization.

The randomized controlled trial that investigated the efficacy of prophylactic ICD at the time of CABG was performed in 1997, and it was before the advent of WCD. Another randomized controlled trial comparing the WCD and early ICD implantation would be warranted.

References

1. Bigger JT Jr. Prophylactic use of implanted cardiac defibrillators in patients at high risk for ventricular arrhythmias after coronary-artery bypass graft surgery. Coronary Artery Bypass Graft (CABG) Patch Trial Investigators. *N Engl J Med.* 1997;337:1569-75.
2. Hohnloser SH, Kuck KH, Dorian P, Roberts RS, Hampton JR, Hatala R, et al; DINAMIT Investigators. Prophylactic use of an implantable cardioverter-defibrillator after acute myocardial infarction. *N Engl J Med.* 2004;351:2481-8.
3. Steinbeck G, Andresen D, Seidl K, Brachmann J, Hoffmann E, Wojciechowski D, et al; IRIS Investigators. Defibrillator implantation early after myocardial infarction. *N Engl J Med.* 2009;361:1427-36.
4. Al-Khatib SM, Stevenson WG, Ackerman MJ, Bryant WJ, Callans DJ, Curtis AB, et al. 2017 AHA/ACC/HRS guideline for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: a report of the American College of Cardiology/American Heart Association task force on clinical practice guidelines and the Heart Rhythm Society. *J Am Coll Cardiol.* 2018;72:91-220.
5. Nakae M, Kainuma S, Toda K, Yoshioka D, Kawamura T, Kawamura A, et al. Ventricular arrhythmias following coronary artery bypass grafting for ischemic cardiomyopathy: when to insert an implanted cardioverter defibrillator? *J Thorac Cardiovasc Surg Open.* 2023;13:163-75.
6. Zishiri ET, Williams S, Cronin EM, Blackstone EH, Ellis SG, Roselli EE, et al. Early risk of mortality after coronary artery revascularization in patients with left ventricular dysfunction and potential role of the wearable cardioverter defibrillator. *Circ Arrhythm Electrophysiol.* 2013;6:117-28.
7. Kuehn C, Ruenke S, Rellecke P, Lichtenberg A, Joskowiak D, Hagl C, et al. Wearable cardioverter defibrillator multicentre experience in a large cardiac surgery cohort at transient risk of sudden cardiac death. *Eur J Cardio Thorac Surg.* 2022;61:1031-40.