JACC: CARDIOVASCULAR INTERVENTIONS VOL. 11, NO. 13, 2018

PUBLISHED BY ELSEVIER

Long-Term Clinical Outcomes and Optimal Stent Strategy in Left Main Coronary Bifurcation Stenting

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CME/MOC Objective for This Article: At the end of the activity the reader should be able to: 1) compare the clinical outcomes of 1- vs. 2-stent strategy for left main coronary artery (LMCA) bifurcation stenting according to stent generation; 2) describe the predictors of major adverse cardiovascular events (MACE) after treating LMCA bifurcation lesions; and 3) appraise the optimal stent strategy and techniques for LMCA bifurcation stenting: which patients need to be treated with a 2-stent strategy?

CME/MOC Editor Disclosure: *JACC: Cardiovascular Interventions* CME/MOC Editor Bill Gogas, MD, PhD, has reported that he has no disclosures.

Author Disclosures: This work was supported by a National Research Foundation of Korea (NRF) grant that was funded by the Korean government (MSIP) (No.2017R1A2B2003191), a grant from the Korea Healthcare Technology Research & Development Project, Ministry for Health & Welfare, Republic of Korea (Nos. A085136 and HI15C1277), and the Cardiovascular Research Center in Seoul, South Korea. The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Medium of Participation: Print (article only); online (article and quiz).

CME/MOC Term of Approval

Issue Date: July 9, 2018
Expiration Date: July 8, 2019

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Manuscript received November 13, 2017; revised manuscript received March 4, 2018, accepted March 6, 2018.

ISSN 1936-8798/$36.00 https://doi.org/10.1016/j.jcin.2018.03.009

JACC: CARDIOVASCULAR INTERVENTIONS VOL. 11, NO. 13, 2018
JULY 9, 2018:1247–58

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ABSTRACT

OBJECTIVES This study sought to investigate the long-term clinical effects of stent generation and stent strategy for left main coronary artery (LMCA) bifurcation lesion treatment.

BACKGROUND Limited data are available to assess long-term clinical outcomes after stenting, including use of current-generation drug-eluting stent (C-DES) for treatment of LMCA bifurcation lesions.

METHODS A total of 1,353 patients who were recorded in 2 multicenter real-world registries were treated by either early-generation drug-eluting stent (E-DES) (n = 889) or C-DES (n = 464). Primary endpoint was major adverse cardiovascular events (MACE). MACE was defined as a composite of cardiac death or myocardial infarction, stent thrombosis, and target lesion revascularization rates during 3-year follow-up. The authors further performed propensity-score adjustment for clinical outcomes.

RESULTS During 3-year follow-up, the overall MACE rate was 8.7%. Use of a 1-stent strategy resulted in better clinical outcomes than use of a 2-stent strategy (4.7% vs. 18.6%, hazard ratio [HR]: 3.71; 95% confidence interval [CI]: 2.55 to 5.39; $p < 0.001$). Use of C-DES resulted in a lower MACE rate compared with using E-DES (4.6% vs. 10.9%, HR: 0.55; 95% CI: 0.34 to 0.89; $p = 0.014$), especially for the 2-stent strategy. For patients with C-DES, the presence of chronic kidney disease and pre-intervention side branch diameter stenosis ≥50% were significant independent predictors of MACE.

CONCLUSIONS Intervention of LMCA bifurcation lesions using DES implantation demonstrated acceptable long-term clinical outcomes, especially in C-DES patients. Use of a 1-stent strategy resulted in better clinical benefits than using a 2-stent strategy. (J Am Coll Cardiol Intv 2018;11:1247–58) © 2018 by the American College of Cardiology Foundation.

Coronary artery bypass graft (CABG) surgery has been the standard treatment for left main coronary artery (LMCA) disease for approximately 30 years, and percutaneous coronary intervention (PCI) has become an emerging alternative treatment option (1,2). However, along with the rapid development of medical technology, current guidelines indicate that PCI with drug-eluting stent (DES) is an optimal revascularization strategy for treatment of LMCA disease (3). Randomized clinical trials (RCTs) revealed that PCI using DES might be a reasonable treatment strategy for LMCA disease (4–7). However, most studies on LMCA bifurcation lesion stenting have examined early-generation DES (E-DES), whereas only a few existing studies have explored the optimal stent strategy for LMCA bifurcation lesion treatment using real-world practice data (8,9). In addition, limited data are available to be used in treatment guidelines for PCI outcomes of LMCA bifurcation lesion, compared with those for LMCA ostial or trunk lesion (10).

We investigated the long-term clinical effects of applying stent strategy and current-generation DES (C-DES) in LMCA bifurcation stenting, using large sample size datasets from 2 multicenter real-world registries.

METHODS

STUDY POPULATION. The KOMATE (Korean Multicenter Angioplasty Team) multicenter registry of DES implantation comprises data from 8 major coronary intervention centers. The COBIS (Coronary Bifurcation Stenting) II registry is a retrospective multicenter