

Intravascular ultrasound is essential for left main coronary artery bifurcation stenting

To the editor We have recently read with great interest the article by Kassimis et al.¹ We appreciate the authors' management of the patient with iatrogenic left main coronary artery (LMCA) dissection and the technical success of LMCA bifurcation stenting. However, we believe that there are some major drawbacks that need to be addressed.

The first and most obvious problem with this case report is the absence of intracoronary imaging during LMCA stenting. In the era of interventional cardiology, intravascular ultrasound (IVUS) has been a useful tool optimizing coronary artery stenting, as currently practiced.² Over the past 2 decades, numerous clinical studies have established many acceptable and appropriate applications of IVUS in the cardiac catheterization laboratory. The 2018 European Society of Cardiology / European Association for Cardio-Thoracic Surgery guidelines on myocardial revascularization recommend the use of IVUS to prevent strut malapposition during LMCA stenting.² We know that a suboptimal stent expansion is the single key factor that has been most strongly associated with stent thrombosis and restenosis after LMCA stenting.³

Second, there has been increasing evidence showing that the double-kissing crush technique is the optimal strategy for LMCA bifurcation stenting.^{4,5} Although there has been no randomized study comparing T and small protrusion and double-kissing crush stenting techniques yet, in a recent meta-analysis, double-kissing crush stenting was associated with fewer major adverse cardiovascular events, driven by lower rates of repeat revascularization.⁴ In the presented case, it might have been more appropriate for the authors to use the double-kissing crush technique for LMCA stenting.

ARTICLE INFORMATION

AUTHOR NAMES AND AFFILIATIONS Ahmet Güner, Ezgi G. Güner, Macit Kalçık, Fatih Uzun, Mehmet Ertürk (AG, EGG, FU, and ME: Department of Cardiology, Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research

Hospital, Istanbul, Turkey; MK: Department of Cardiology, Faculty of Medicine, Hitit University, Corum, Turkey)

CORRESPONDENCE TO Ahmet Güner, MD, Department of Cardiology, Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital, 34303, Kucukcekmece, Istanbul, Turkey, phone: +90 505 6533335, email: ahmetguner488@gmail.com

CONFLICT OF INTEREST None declared.

OPEN ACCESS This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (CC BY-NC-ND 4.0), allowing third parties to download articles and share them with others, provided the original work is properly cited, not changed in any way, distributed under the same license, and used for non-commercial purposes only. For commercial use, please contact the journal office at kardiologiapol@ptkardio.pl.

HOW TO CITE Güner A, Güner EG, Kalçık M, et al. Intravascular ultrasound is essential for left main coronary artery bifurcation stenting. *Kardiol Pol.* 2021; 79: 97. doi:10.33963/KP.15768

REFERENCES

- 1 Kassimis G, Theodoropoulos KC, Kontogiannis N, Raina T. Successful bailout T-stenting for iatrogenic coronary dissection involving left main stem bifurcation: "first, do no harm." *Kardiol Pol.* 2020; 78: 1185-1186.
- 2 Neumann FJ, Sousa-Uva M, Ahlsson A, et al. 2018 ESC/EACTS Guidelines on myocardial revascularization. *Eur Heart J* 2019; 40: 87-165.
- 3 Kang SJ, Ahn JM, Song H, et al. Comprehensive intravascular ultrasound assessment of stent area and its impact on restenosis and adverse cardiac events in 403 patients with unprotected left main disease. *Circ Cardiovasc Interv.* 2011; 4: 562-569.
- 4 Di Gioia G, Sonck J, Ferenc M, et al. Clinical outcomes following coronary bifurcation PCI techniques: a systematic review and network meta-analysis comprising 5,711 patients. *JACC Cardiovasc Interv.* 2020; 13: 1432-1444.
- 5 Lynn BS, Hermiller JB. Treatment of bifurcation lesions: has DK crush "ed" the competition? *Curr Cardiol Rep.* 2018; 20: 101.

Authors' reply The left main stem (LMS) provides perfusion to at least 2/3 of the left ventricular myocardium in patients with right coronary dominance.¹ Potential complications occurring during LMS catheterization or intervention can therefore rapidly progress towards hemodynamic instability.² Intravascular ultrasound (IVUS) represents a valuable supplement for the LMS assessment and treatment, especially in the nonemergency setting.^{1,3} However, data from the largest published registry have shown that, in patients with unprotected LMS obstruction, as in our case, IVUS was used in only 11% of the patients because of hemodynamic instability.⁴ The role of percutaneous coronary intervention (PCI) in the treatment of this potentially

life-threatening complication is the rapid restoration of coronary blood flow to avoid progressive circulatory failure.

The European Bifurcation Club recommends provisional stenting as the first-line bifurcation PCI strategy for most cases of LMS.⁵ Double-kissing crush stenting is a complex and time-consuming technique that involves several procedural steps and would not be recommended in emergency clinical scenarios such as the one encountered in our case.² Of note, patients with unprotected LMS obstruction were excluded from the meta-analysis of various bifurcation PCI techniques by Di Gioia et al.⁶ Finally, no difference was observed in terms of “hard clinical endpoints” such as cardiac death, myocardial infarction, or stent thrombosis among the compared PCI techniques. A reduction in target lesion revascularization rates found in the double-kissing crush group compared with provisional stenting may be explained by the fact that the trials assessing the effectiveness of double-kissing crush stenting were designed with routine angiographic follow-up. This may account for the higher rate of target lesion revascularization in the comparator arm, impacting the primary outcome of interest in the meta-analysis.

6 Di Gioia G, Sonck J, Ferenc M, et al. Clinical outcomes following coronary bifurcation PCI techniques: a systematic review and network meta-analysis comprising 5,711 patients. *JACC Cardiovasc Interv.* 2020; 13: 1432-1444.

ARTICLE INFORMATION

AUTHOR NAMES AND AFFILIATIONS George Kassimis, Konstantinos C. Theodoropoulos, Nestoras Kontogiannis, Tushar Raina (GK: Department of Cardiology, Cheltenham General Hospital, Gloucestershire Hospitals NHS Foundation Trust, Cheltenham, United Kingdom and 2nd Cardiology Department, Hippokratia Hospital, Medical School, Aristotle University of Thessaloniki, Greece; KCT: 2nd Cardiology Department, Hippokratia Hospital, Medical School, Aristotle University of Thessaloniki, Greece; NK and TR: Department of Cardiology, Cheltenham General Hospital, Gloucestershire Hospitals NHS Foundation Trust, Cheltenham, United Kingdom)

CORRESPONDENCE TO Nestoras Kontogiannis, MD, Department of Cardiology, Cheltenham General Hospital, Gloucestershire Hospitals NHS Foundation Trust, Cheltenham, GL53 7AN, United Kingdom, phone: +44 300 422 2222, email: kontonest@gmail.com

CONFLICT OF INTEREST None declared.

OPEN ACCESS This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (CC BY-NC-ND 4.0), allowing third parties to download articles and share them with others, provided the original work is properly cited, not changed in any way, distributed under the same license, and used for non-commercial purposes only. For commercial use, please contact the journal office at kardiologiapolska@ptkardio.pl.

HOW TO CITE Kassimis G, Theodoropoulos KC, Kontogiannis N, Raina T. Intravascular ultrasound is essential for left main coronary artery bifurcation stenting. Authors' reply. *Kardiol Pol.* 2021; 79: 97-98. doi:10.33963/KP.15769

REFERENCES

- 1 Kassimis G, de Maria GL, Patel N, et al. Assessing the left main stem in the cardiac catheterization laboratory. What is “significant”? Function, imaging or both? *Cardiovasc Revasc Med.* 2018; 19: 51-56.
- 2 Kassimis G, Theodoropoulos KC, Kontogiannis N, Raina T. Successful bailout T-stenting for iatrogenic coronary dissection involving left main stem bifurcation: “first, do no harm.” *Kardiol Pol.* 2020; 78: 1185-1186.
- 3 Kassimis G, Raina T, Kontogiannis N, et al. Percutaneous or surgical revascularization for left main stem disease: NOBLE ideas, but do they EXCEL? *Expert Rev Cardiovasc Ther.* 2019; 17: 361-368.
- 4 Patel N, De Maria GL, Kassimis G, et al. Outcomes after emergency percutaneous coronary intervention in patients with unprotected left main stem occlusion: the BCIS national audit of percutaneous coronary intervention 6-year experience. *JACC Cardiovasc Interv.* 2014; 7: 969-980.
- 5 Banning AP, Lassen JF, Burzotta F, et al. Percutaneous coronary intervention for obstructive bifurcation lesions: the 14th consensus document from the European Bifurcation Club. *EuroIntervention.* 2019; 15: 90-98.