

Contemporary issues of percutaneous coronary intervention in heavily calcified chronic total occlusions: an expert review from the European CTO Club

Kambis Mashayekhi^{1,2*}, MD, PhD; Stylianos A. Pyxaras³, MD, PhD; Gerald S. Werner⁴, MD, PhD; Alfredo R. Galassi⁵, MD, PhD; Roberto Garbo⁶, MD; Nicolas Boudou⁷, MD; Gregor Leibundgut⁸, MD, PhD; Alexandre Avran⁹, MD; Leszek Bryniarski^{10,11}, MD, PhD; Alexander Bufe¹², MD; Georgios Sianos¹³, MD, PhD; Carlo Di Mario¹⁴, MD, PhD

1. MediClin Heart Center Lahr, Lahr, Germany; 2. Division of Cardiology and Angiology II, University Heart Center Freiburg, Bad Krozingen, Germany; 3. Medizinische Klinik I, Klinikum Fürth, Fürth, Germany; 4. Medizinische Klinik I (Cardiology & Intensive Care), Klinikum Darmstadt GmbH, Darmstadt, Germany; 5. U.O.C. Cardiologia, Dipartimento di Promozione della Salute, Materno-Infantile, di Medicina Interna e Specialistica di Eccellenza (ProMISE) "G. D'Alessandro", A.O.U. Policlinico Paolo Giaccone, Università degli Studi, Palermo, Italy; 6. Department of Cardiology, San Giovanni Bosco Hospital, ASL Città di Torino, Turin, Italy; 7. Interventional Cardiology, Clinique Saint Augustin, Bordeaux, France; 8. Department of Cardiology, University Hospital Basel, Basel, Switzerland; 9. Department of Interventional Cardiology, Clinique Louis Pasteur, Essey-lès-Nancy, France; 10. Department of Cardiology and Cardiovascular Interventions, Institute of Cardiology, Jagiellonian University Medical College, Kraków, Poland; 11. Department of Cardiology and Cardiovascular Interventions, University Hospital, Kraków, Poland; 12. Department of Cardiology, Heart Centre Niederrhein, Helios Clinics Krefeld, Krefeld, Germany; 13. 1st Cardiology Department, AHEPA University General Hospital of Thessaloniki, Thessaloniki, Greece; 14. Structural Interventional Cardiology, Department of Experimental and Clinical Medicine, Careggi University Hospital, Florence, Italy

KEYWORDS

- calcified stenosis
- chronic coronary total occlusion
- rotablator

Abstract

Severe calcification is frequent in coronary chronic total occlusions (CTO), and its presence has been associated with increased procedural complexity and poor long-term outcomes following percutaneous coronary intervention (PCI) in an already challenging anatomical setting. The diagnostic characterisation of heavily calcified CTOs using non-invasive and invasive imaging tools can lead to the application of different therapeutic options during CTO PCI, in order to achieve adequate lesion preparation and optimal stent implantation. In this expert review, the European Chronic Total Occlusion Club provides a contemporary, methodological approach, specifically addressing heavily calcified CTOs, suggesting an integration of evidence-based diagnostic methods to tailored, up-to-date percutaneous therapeutic options.

*Corresponding author: Internal Medicine and Cardiology, MediClin Heart Center Lahr, Hohbergweg 2, 77933 Lahr, Germany. E-mail: kambis.mashayekhi@mediclin.de

