Percutaneous Intervention for Coronary Chronic Total Occlusion

The Hybrid Approach

Stéphane Rinfret
Editor

Springer

Percutaneous Intervention for Coronary Chronic Total Occlusion

Stéphane Rinfret
Editor

Percutaneous Intervention for Coronary Chronic Total Occlusion

The Hybrid Approach

Springer

Editor
Stéphane Rinfret
Multidisciplinary Cardiology Department
Quebec Heart and Lung Institute
Quebec
Canada

ISBN 978-3-319-21562-4 ISBN 978-3-319-21563-1 (eBook)
DOI 10.1007/978-3-319-21563-1

Library of Congress Control Number: 2015952644

Springer Cham Heidelberg New York Dordrecht London

Printed on acid-free paper

Springer International Publishing AG Switzerland is part of Springer Science+Business Media (www.springer.com)

To Marie and Justine, for all their love and support

Foreword

Complete revascularization, i.e., revascularization of all ischemic myocardial regions, is the accepted goal to optimize long-term outcomes including survival and freedom from myocardial infarction. Even the most ardent interventionalist must concede that coronary bypass surgery (CABG) is currently more effective in achieving complete revascularization. This superiority is due to greater efficacy in revascularizing territories supplied by chronic total occlusions (CTOs). Thus, the ability to predictably recanalize the CTO is central for percutaneous intervention (PCI) to achieve the same degree – or greater revascularization relative to CABG. When this equality occurs (and it will), a comparison of PCI vs CABG in multivessel disease may show improved outcomes with PCI relative to the best current comparison (SYNTAX) of these two modalities.

Technical advances, including antegrade wiring approaches and dedicated CTO wires, antegrade dissection and re-entry with a dedicated system, and retrograde approaches have been key to the improved recanalization rates reported in the last decade. We can expect with current techniques a success rate of 90 % or more for lesions that are appropriate to treat for clinical indications. This success rate is particularly impressive by operators whose primary decision point is clinical need, regardless of the technical challenges.

A recent procedural advance is related more to a strategic "state-of-mind" than to a technical advance. The "hybrid approach" provides a plan to succeed. It teaches that one should nimbly move from one approach to another if progress is not being made. A pre-procedure plan is the mandatory first step, utilizing in part the "hybrid algorithm" to prioritize various technical approaches. If Plan A is not going well, then the operator moves to Plan B or based on observations during Plan A modify Plan A accordingly. The hybrid approach implies a level of mastery with each of the known techniques so the operator can move easily from one technique to the other. It also implies that the operator knows when "enough is enough" and this conclusion, in the final analysis, is an intuitive feel conditioned by experience and supported by the operator's commitment to succeed.

This book has admirably addressed the techniques required for mastering CTO recanalization, each chapter written by acknowledged experts. It is an outstanding educational resource for those interventionalists committed to full revascularization in the cath lab.

Barry F. Uretsky, MD

Preface

Chronic total occlusions (CTOs), from a technical point of view, are used to be considered the last frontier of percutaneous coronary intervention (PCI). Because they were difficult to open, many physicians preferred to consider CTOs as a different subset of lesions that for obscure reason would not derive the same benefit if reopened compared to non-occlusive lesions, even considering the same amount of ischemia and symptoms. Ironically, CTOs have been the only lesion subset in interventional cardiology for which interventional cardiologists tried to find good reasons not to open them. On the other hand, bifurcations, multivessel disease, left main PCI found many advocates, despite the same level of evidence, likely because they were much simpler to treat technically.

Fortunately, those pioneer operators, who were considered dangerous "cowboys" by colleagues, have courageously moved the field forward. It was obviously an unjustified accusation. "Cowboys" are operators doing things beyond their skill level, without any respect to the risk to benefit ratio. CTO PCI operators cannot be cowboys; otherwise, they quickly are put out of business. This entire field has moved forward thanks to operators who have pursued their quest for excellence despite criticism, despite superficial judgment from peers, despite the lack of financial incentive, and despite the lack of recognition by the community. They were few at the beginning. With the tremendous input of very innovative and skillful Japanese operators, few American operators made a substantial effort to adapt to the western world practice, with the few and limited available devices early on. It is needless to say how pioneers such as Barry Rutherford and Barry Uretsky have paved the way, followed by the tremendous energy input from William Lombardi, Craig Thompson, Mike Wyman, and Aaron Grantham. They were among this first generation of believers who clearly wanted to share their knowledge they acquired hardly in adversity.

I consider myself one of the fortunate who have benefited from their teaching on a personal basis. I adapted some of their teaching to the Canadian environment, much more prone to work from a transradial approach. But first and foremost, we all became friends, noticing that we were all on the same page, witnessing the birth of "school of thoughts" as a result of free and enthusiastic knowledge dissemination across country borders. We all came to a conclusion that our objective was noble: to open arteries, obviously not the ones supplying non-viable myocardium, but the ones that were causing ischemia and angina, resulting in poor quality of life. We all realized that, with the time restraints that the North-American practice impose to interventional cardiologist, we had to maximize the testing of many potential successful strategies such as antegrade wiring, retrograde approach, and dissection re-entry techniques while reducing the amount of contrast and radiation in the same procedure. We were convinced this novel approach would attract many operators who were skeptical to CTO PCI. And from this seminal work led by Manos Brilakis, we came to this hybrid perspective, which we all refer to in our teaching endeavors. This approach resulted from the rejection of dogmas through a practical perspective. The hybrid approach, a new school of teaching in CTO PCI, has produced more followers than any other approaches of knowledge translation. From a dozen of centers performing high-volume CTO PCI before 2010, we can now count on hundreds of operators who clearly joined the battle.

I consider myself privileged to have learned from all those out-of-the-box thinkers I met over the last few years. This book was the opportunity to give them another platform to reach the community with this infective passion that has moved us forward. With this set of chapters, I am convinced that you will find the most up-to-date knowledge on the hybrid approach to CTO PCI.

Quebec City, QC, Canada Stéphane Rinfret, MD, SM

Contents

Contributors

Khaldoon Alaswad, MD Section of Cardiology, Department of Medicine, Henry Ford Hospital, Detroit, MI, USA

Emmanouil S. Brilakis, MD, PhD Department of Cardiology, VA North Texas Health Care System, Dallas, TX, USA

Christopher E. Buller, MD, FRCPC Division of Cardiology, St. Michael's Hospital, University of Toronto, Toronto, ON, Canada

M. Nicholas Burke, MD Department of Medicine, Minneapolis Heart Institute, Minneapolis, MN, USA

Mauro Carlino, MD Department of Interventional Cardiology, San Raffaele Hospital Milano, Milan, Italy

Tony DeMartini, MD Department of Cardiology, Advocate Heart Institute, Downers Grove, IL, USA

Creighton W. Don, MD Division of Cardiology, University of Washington Medical Center, Seattle, WA, USA

Parag Doshi, MD, FACC, FSCAI Department of Medicine, Chicago Cardiology Institute, Schaumburg, IL, USA

Benjamin Faurie, MD Institut Cardiovasculaire, Groupe Hospitalier Mutualiste de Grenoble, Grenoble, France

John J. Graham, BSc(hons), MB, ChB, MRCP (UK) Division of Cardiology, St. Michael's Hospital, Toronto, ON, Canada

Rolf Graning, MD Department of Cardiology, William Beaumont Hospital, Royal Oak, MI, USA

J. Aaron Grantham, MD, FACC Department of Cardiology, University of Missouri Kansas City, Kansas City, MO, USA

Department of Cardiology, Saint Luke's Health System's Mid America Heart Institute, Kansas City, MO, USA

Dominique Joyal, MD Department of Medicine, Jewish General Hospital/McGill University, Montreal, QC, Canada

Dimitri Karmpaliotis, MD, PhD, FACC Department of Cardiology, NYPH/Columbia University Medical Center, New York, NY, USA

Mohamad Lazkani, MD Department of Interventional Cardiology, Banner University Medical Center - Phoenix, AZ, USA

William L. Lombardi, MD Department of Cardiology, University of Washington Medical Center, Seattle, WA, USA

Samer Mansour, MD Department of Medicine, Centre Hospitalier de l'Université de Montréal, Montreal, QC, Canada

Steven P. Marso, MD Department of Internal Medicine, University of Texas Southwestern Medical Center, Dallas, TX, USA

William J. Nicholson, MD Division of Interventional Cardiology, WellSpan York Hospital, York, PA, USA

Antonis N. Pavlidis, MD, PhD, FACC Department of Cardiology, Barts Health NHS Trust, London, UK

Ashish Pershad, MD, FACC, FSCAI Division of Interventional Cardiology, Banner University Medical Center - Phoenix, AZ, USA

Michael E. Rich, MD Department of Cardiology, Banner Good Samaritan Hospital, Phoenix, AZ, USA

Stéphane Rinfret, MD, SM Multidisciplinary Department of Cardiology, Quebec Heart and Lung Institute, Quebec City, QC, Canada

Laval University, Quebec City, QC, Canada

James Sapontis, BSc, MBBCh, FRACP Department of Medicine, Monash Heart, Cardiology, Monash Medical Center, Melbourne, VIC, Australia

Elliot J. Smith, MD, MRCP Department of Cardiology, London Chest Hospital, Barts Health NHS Trust, London, UK

James C. Spratt, BSc, MD, FRCP, FESC, FACC Department of Cardiology, Forth Valley Royal Hospital, Larbert, UK

Minh N. Vo, MD Department of Cardiology, St. Boniface Hospital, Winnipeg, MB, Canada

Simon Walsh, MD, FRCP, FSCAI Cardiology Department, Belfast Health and Social Care Trust, Belfast City Hospital, Belfast, UK

R. Michael Wyman, MD Department of Medicine, Torrance Memorial Medical Center, Torrance, CA, USA