23rd CARDIOVASCULAR SUMMIT
TCTAP2018

TCTAP DAILY NEWS

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Sunday, April 29, 2018

Seung-Jung Park, MD

Asan Medical Center, Korea

"Welcome

Inside TCTAP 2018: Building a New Consensus on the Way Forward"

During the major growth period for the field of interventional cardiology, the 1990s, TCTAP meeting was launched for Asian physicians who had very limited opportunities to be exposed to the latest techniques and data, and to present the results of their research. TCTAP has made unceasing changes through various attempts and has become the best platform for medical exchange to represent different perspectives and thoughts in the field of cardiology at the moment. For the years to come and to reinvigorate motivation, TCTAP will try to keep up with the newest innovations and provide high quality research and scientific resources, as well as professional interactions for the advancement of science. We hope that the following highlights will deeply inspire the participants to encourage them to keep pushing toward new goals.

Late-Breaking Research from Asan Medical Center & Spotlight Major Clinical Trials with Expert's Opinion

This session brings together distinguished experts from Asan Medical Center, leading interventional cardiologist and practitioners, to exchange and share their provoking thoughts on recent clinical trials in cardiology. We are certain that the presentations and subsequent debates on these impressive trials will be of great educational value.

Live Case Demonstrations from World Renowned Centers

Live case demonstrations will be streamed from various world-leading international medical centers across the globe.

Continued on page 13

Today's Highlights

Master the CTO 2018
8:30 AM - 6:00 PM
CTO Theater, Level 1

Endovascular Symposium
8:30 AM - 6:00 PM
Endovascular Theater, Level 1

TCTAP Workshops
8:30 AM - 6:00 PM
Room 104, Level 1

Moderated E-Poster Competition
10:00 AM - 11:20 AM
E-Poster Zone, Level 1

Moderated Abstract and Complex Case Competition
2:00 PM - 6:00 PM
Abstract & Case Zone, Level 1

Satellite Symposia: Morning Roundtable Forum
7:00 AM - 8:10 AM*

Lunchtime Activities
12:45 PM - 1:45 PM*

*For details on the locations, please check TCTAP 2018 App

General Information

Shuttle Bus

Free shuttle bus is provided between COEX and several venue hotels.
Visit the **CVRF booth** for more details.

Certificate of Attendance

Certificate of Attendance for TCTAP 2018 will be distributed along with the badge.

Cyber Station / Free Mobile Charging Station

- CVRF Booth, Grand Ballroom Lobby, Level 1
- Registration Lounge, Exhibition (B2) Hall Lobby, Level 1

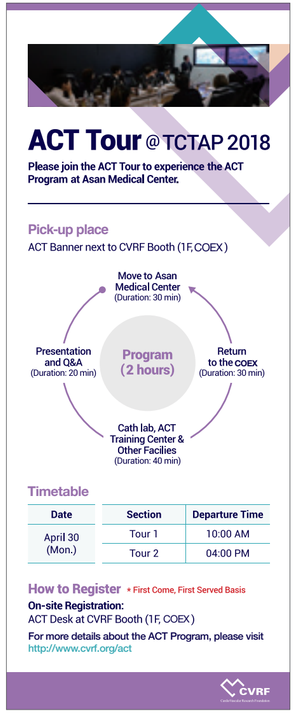
Registration / Lost and Found / Coat Room

- Opening Hours: **6:00 AM ~ 6:10 PM**, Sunday, April 29 ~ Tuesday, May 1
- Registration Booth, Exhibition (B2) Hall Lobby, Level 1

Tour Information

Tour information will be provided by COSMO JIN Tour and Seoul Metropolitan Government.

- Information Booth, Grand Ballroom Lobby, Level 1
- Seoul Promotional Booth, Grand Ballroom Lobby, Level 1



TCTAP Wrap-up Interviews

Here the most debated issues will be discussed in an interactive way. TCTAP 2018 Wrap-up Interviews are 30-minute moderated interview sessions in an open studio.

The purpose of these interviews is to address professional knowledge and experience on selected topics in details with world's leading experts in the field of cardiovascular medicine. Distinguished experts will provide various aspects of the selected topics and exchange lessons learned through open discussions.

Participants at TCTAP 2018 will be able to watch the interviews during the meeting not only at the designated spots but also via TCTAP Webcast (webcast.summitmd.com) and TCTAP mobile application in real-time.

Completed interviews will be broadcasted on our websites at **www.summit-tctap.com, www.youtube.com/CVRFevents, and webcast.summitmd.com,** and **on TCTAP mobile application.**

Sunday, April 29

Left Main & Non-Left Main Bifurcation PCI: Technique or Concept
11:30 AM - 12:00 PM
Moderator: Thierry Lefevre
Interviewees: David E. Kandzari, Yves R. Louvard, Duk-Woo Park

DES & New BRS
2:00 PM - 2:30 PM
Moderator: Patrick W. Serruys
Interviewees: Tullio Palmerini, Takeshi Kimura, Chuck Simonton

Role of Coronary Imaging
4:00 PM - 4:30 PM
Moderator: Gary S. Mintz
Interviewees: Evelyn Regar, Takashi Akasaka, Akiko Maehara

Monday, April 30

CTO: To Open or Not to Open
8:40 AM - 9:10 AM
Moderator: Gerald Werner
Interviewees: Kambis Mashayekhi, Seung-Whan Lee, Paul Hsien-Li Kao

TAVR: Current Status and Future Perspectives
9:30 AM - 10:00 AM
Moderator: Eberhard Grube
Interviewees: John Graydon Webb, Owen Christopher Raffel, Vinayak Bapat

Non-vitamin K antagonist Oral Anticoagulants (NOACs) in Atherosclerotic Cardiovasular Disease
10:30 AM - 11:00 AM
Moderator: David J. Cohen
Interviewees: Dominick J. Angiolillo, Tullio Palmerini

PCI vs. CABG in Left Main and MVD
2:30 PM - 3:00 PM
Moderator: Patrick W. Serruys
Interviewees: Gregg W. Stone, Seung-Jung Park, Marie-Claude Morice

Program at a Glance + Partnership Session Schedule

	CTO Theater *Level 1*	Endovascular Theater *Level 1*	Room 104 *Level 1*	Room 105 *Level 1*	Other Session Rooms	E-Poster Zone *Level 1*	Abstract Zone I, II *Level 1*	Case Zone I, II, III *Level 1*
07:00	Satellite Symposia - Morning Roundtable Forum							
07:30								
08:00								
08:30	Master the CTO 2018	Endovascular Symposium Live Cases & Lectures	TCTAP Workshop Left Main and Bifurcation PCI			Moderated E-Poster Competition		
09:00								
09:30								
10:00								
10:30			DES & New BRS					
11:00								
11:30								
12:00								
12:30	Satellite Symposia - Lunchtime Activities							
13:00								
13:30								
14:00	Master the CTO 2018	Coronary Symposium Live Cases & Lectures	TCTAP Workshop Imaging & Physiology	Partnership Session CIT			Moderated Abstract Competition	Moderated Complex Case Competition
14:30								
15:00								
15:30			ACS & Pharmacotherapy	ACC-i2				
16:00								
16:30			Valves	BIT				
17:00								
17:30								
18:00								

Partnership Sessions with International Societies and Meetings

CIT @ TCTAP 2018
- 2:00 PM - 3:30 PM
  @ Room 105, Level 1

ACC-i2 @ TCTAP 2018
- 3:30 PM - 4:30 PM
  @ Room 105, Level 1

BIT @ TCTAP 2018: Interesting PCI Cases from Bangla Interventional Therapeutics
- 4:30 PM - 6:00 PM
  @ Room 105, Level 1

Live Case Transmission from World-Renowned Medical Centers

Asan Medical Center, Seoul, Korea
- 8:35 AM ~ 10:00 AM @ CTO Theater, Level 1
- Operator(s): (Case #1) Nae Hee Lee, Jon Suh
  (Case #2) Yasushi Asakura, Hyuck Jun Yoon
- 10:50 AM ~ 12:00 PM @ CTO Theater, Level 1
- Operator(s): (Case #3) Seung-Whan Lee, Chang Hoon Lee, Gyung-Min Park
  (Case #4) Toshiya Muramatsu, Yoon Seok Koh
- 2:00 PM ~ 3:00 PM @ Endovascular Theater, Level 1
- Operator(s): (Case #5) Seung-Whan Lee, Young Rak Cho
  (Case #6) Lawrence A. Garcia, Gyung-Min Park
- 4:00 PM ~ 5:00 PM @ Endovascular Theater, Level 1
- Operator(s): (Case # 7) Robert Bersin, Chang Hoon Lee
  (Case # 8) Hiroshi Ando, Pil Hyung Lee

Severance Hospital, Seoul, Korea
- 8:35 AM ~ 9:40 AM @ Endovascular Theater, Level 1
- Operator(s): (Case #1) Ravish Sachar, Chul-Min Ahn
  (Case #2) Jae-Hwan Lee, Sanghoon Shin
- 10:30 AM ~ 11:30 AM @ Endovascular Theater, Level 1
- Operator(s): (Case #3) Young-Guk Ko, Sanghoon Shin
  (Case #4) Kishore Sieunarine, Chul-Min Ahn
- 2:00 PM ~ 3:20 PM @ CTO Theater, Level 1
- Operator(s): (Case #5) Yangsoo Jang, Sung-Jin Hong
  (Case #6) Paul Hsien-Li Kao, Byeong-Keuk Kim
- 4:00 PM ~ 5:20 PM @ CTO Theater, Level 1
- Operator(s): (Case #7) Kenya Nasu, Jung-Hee Lee
  (Case #8) Yasumi Igarashi, Hoyoun Won

Imaging & Physiology

[Vulnerable Plaque Detection: What is New in 2018?] Insight from Pathology

Aloke V. Finn, MD

CVPath Institute, Inc., USA

Vulnerable plaque detection is sometimes referred to as the holy grail of cardiology. After all, locating a plaque before it ruptures and potentially intervening either through pharmacologic or interventional means would save lives and prevent the enormous burden of morbidity that afflicts most patients who have suffered from myocardial infarction. Unfortunately, progress in this area has been slow in coming. Most *in vivo* work trying to identify vulnerable plaque in humans has been based upon the pathologic definition of vulnerable plaque or the thin-cap fibroatheroma (TCFA). The morphologic criteria that supports the pathologic definition of this entity was derived from pathologic analysis of ruptured plaque whereby the lesions that were close in morphology but not yet ruptured were termed vulnerable plaques.

A necrotic core characterizes plaque rupture with an overlying thin-ruptured cap infiltrated by macrophages and lymphocytes. There are few or no smooth muscle cells within the cap. The thickness of the fibrous cap near the rupture site measures 23±19 μm, with 95% of caps measuring <65 μm. Lesions with intact fibrous caps of <65 μm observed at other sites in the coronary vasculature are designated as vulnerable plaques or TCFAs. This, of course, means at the present time the term is exclusive to plaque ruptures and excludes other entities such as plaque erosion that is also responsible for myocardial infarction.

Unfortunately, cause and effect data which provide definitive proof that vulnerable plaques (as defined above) do go on to rupture is missing. Clinical studies relying on detection through plaque morphology alone have been conducted using intravascular imaging modalities such as intravascular ultrasound (IVUS) or optical coherence tomography (OCT). Perhaps the best known study to examine where intravascular imaging could accurately locate vulnerable plaques was the PROSPECT study, in which 697 patients with acute coronary syndromes (ACS) underwent 3-vessel IVUS with virtual histology of non-culprit lesions and were followed for a median of 3.4 years. Unfortunately, the rate of events for IVUS-defined TCFAs was only 4.9%. A major limitation today exists partly because the precise mechanisms of progression from an asymptomatic stable to high-risk plaque (TCFA or vulnerable plaque) that lead to rupture and thrombosis are incompletely understood.

Our lab is focused on increasing our knowledge of the mechanisms of human plaque progression. One area of focus is the role of intraplaque hemorrhage (IPH). We and others have previously shown that IPH is a critical event in atherogenesis, which fundamentally alters plaque microenvironment by increasing content of red cell membrane-derived free cholesterol that causes necrotic core expansion, a hallmark of ruptured plaques and plaque progression. Our more recent work has focused on the inflammatory response to IPH. We and others have described that the intake of hemoglobin:haptoglobin complex, which are formed in areas where hemorrhage occurs by macrophages via the CD163 receptor on their surface, leads to a distinct phenotype of macrophage termed M(Hb) or Mhem found in areas of neoangiogenesis and hemorrhage characterized by high surface expression of CD163, reduced pro-inflammatory cytokine production, and lack of lipid retention, all characteristics which distinguish them from foamy macrophages. Based upon these findings, M(Hb) macrophage has been termed 'atheroprotective'. However, their association with areas of intraplaque angiogenesis and permeability raises the important question of whether these cells are merely bystanders or play an active role in these processes.

Our recent work shows a clear pathogenic role for these cells in plaque progression through mechanisms that promote intraplaque angiogenesis, permeability, inflammatory cell recruitment, and plaque progression in human atherosclerosis (Journal of Clinical Investigation 2018). These results suggest that the macrophage inflammatory response to hemorrhage actually promotes plaque destabilization by initiating a vicious cycle that likely leads to further intraplaque bleeding, inflammatory cell recruitment, and necrotic core expansion.

Further work in the area of vulnerable plaque detection will need to target specific mechanisms thought to be important in plaque progression rather than focus on structure alone.

Our research suggests further work to identify area of IPH using either specific molecular imaging such as near infrared catheters combined with OCT may be a more promising approach to vulnerable plaque detection.

TCTAP Workshops
Imaging & Physiology
›› Sunday, April 29, 2:00 PM – 3:40 PM
›› Room 104, Level 1

Intravascular Imaging of Coronary Calcification and Its Clinical Implications

Gary S. Mintz, MD

Cardiovascular Research Foundation, USA

Angiography is only moderately sensitive for detection of extensive lesion calcium (sensitivity 60% and 85% for three- and four-quadrant calcium). The only predictor of intravascular ultrasound (IVUS) calcium was angiographic calcification elsewhere in the coronary tree.

In general, increasing amounts of IVUS-detected calcium was associated with increasing percutaneous coronary intervention (PCI) dissections and decreased vessel expansion. In 61 patients with stable angina and severe angiographic calcium, a calcium plate thickness <505 μm was the cut-off for predicting calcium fracture caused by PCI with everolimus-eluting stent (EES) (AUC = 0.943, Sensitivity: 87%, Specificity: 86%). An optical coherence tomography (OCT)-based calcium scoring system to predict stent under-expansion was derived from pre- and post-stent OCT in a test cohort of 128 points. Maximum calcium angle >180°, maximum calcium thickness >0.5 mm, Calcium length >5 mm was used in the scoring system and showed good correlation with the degree of stent expansion in a validation cohort of 133.

Sometimes, coronary thrombosis is related to disruptive nodular calcifications protruding into the lumen. Calcific nodules have the greatest amount of calcification relative to plaque area among vulnerable plaque subtypes. Calcific nodules are thought to be associated with a healed fibroatheroma and, potentially, frequent intraplaque hemorrhage. In the PROSPECT trial, at least one calcified nodule was present in 16% of arteries and 30% of patients. Two or more calcified nodules were detected in 48 coronary arteries (3%) of 76 patients (12%).

There were consistently fewer non-culprit lesion major adverse cardiac events in the calcified nodule group compared with the non-calcified nodule group at 3-year follow-up. The 3-year cumulative non-culprit lesion major adverse cardiac evet (MACE) rates were 7.1% versus 14.2%.

TCTAP Workshops
Imaging & Physiology
›› Saturday, April 28, 12:00 PM – 2:00 PM
›› Room 104, Level 1

Microvascular Dysfunction: Evaluation and Its Clinical Implication

Joo Myung Lee, MD

Samsung Medical Center, Korea

The pressure-derived fractional flow reserve (FFR) index has become a standard invasive method to evaluate the functional significance of epicardial coronary artery stenosis, and clinical outcomes of FFR-guided percutaneous coronary intervention (PCI) have proven to be better than those of angiography-guided PCI or medical treatment. However, clinical events occur even in patients with high FFR, therefore, assessment of microvascular disease using coronary flow reserve (CFR) and the index of microcirculatory resistance (IMR) is important in prognostic insights for ischemic heart disease patients.

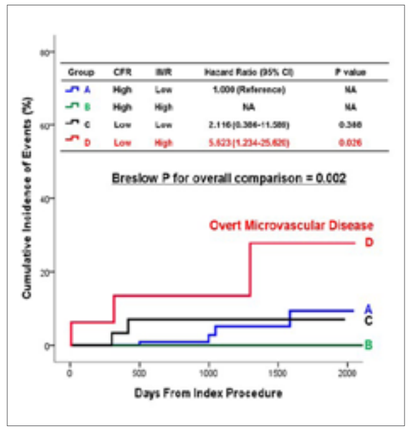


Figure 1. The cumulative risk of patient-oriented composite outcomes among patients with high FFR (a composite of any death, any MI, and any revascularization)

From the international registry data, IMR showed no correlation with FFR and angiographic lesion severity, and the predictors of high IMR value were different from those for ischemic FFR value. Determinants of FFR ≤0.80 were left anterior descending (LAD), angiographic diameter stenosis ≥50%, male, and age. However, high IMR was independently associated with previous myocardial infarction, lesion located in the right coronary artery (RCA), female gender, and obesity (body mass index [BMI] ≥25).

In a recent study, 313 patients (663 vessels of intermediate stenosis) with mean FFR of 0.85 ± 0.09 underwent a comprehensive physiologic assessment using CFR and IMR, and were divided into four groups **(Figure 1)**. Group D (low CFR and high IMR) had a significantly higher risk of patient-oriented composite outcomes (POCO) than Group A (HR, 5.623; 95% CI, 1.234–25.620; p=0.026). The presence of overt microvascular disease (low CFR and high IMR) was an independent prognostic factor in patients with high FFR.

Considering the abovementioned results, integration of microvascular assessment using CFR and IMR with FFR can provide additional information on coronary circulation and improve risk stratification of patients with high FFR.

TCTAP Workshops
Imaging & Physiology
›› Saturday, April 28, 12:00 PM – 2:00 PM
›› Room 104, Level 1

FFR is Still Standard!

The concept of fractional flow reserve (FFR) has been extensively studied and clinically validated. FFR was initially derived as a pressure-derived proxy measure of relative coronary flow reserve; produced by direct measures of flow was performed in a healthy animal model. Up to now, multiple studies performed by numerous different groups in a variety of patient populations, over >1,500, have shown that FFR values below 0.75-0.80 have a very high specificity for identifying ischemia based on a variety of noninvasive imaging studies. This value was accepted even in various lesion subsets including multivessel disease, left main disease, ostial lesions, tandem lesions, diffuse disease, unstable angina pectoris and non-ST-elevation myocardial infarction.

William F. Fearon, MD

Stanford University School of Medicine, USA

From the most recent validation study, FFR showed better discrimination ability than other indices, such as instantaneous wave-free ratio (iFR) or resting distal coronary artery pressure/aortic pressure (Pd/Pa). FFR is extremely reproducible and independent of hemodynamic perturbations. The coefficient of variation of two repeated FFR measurements was 1.6%, and there was no significant difference in FFR after changing the heart rate, the blood pressure, or the left ventricular contractility. Even contrast based FFR (cFFR) provided diagnostic performance superior to that of Pd/Pa or iFR for predicting FFR.

FFR has also provided evidence as a marker of ischemia and as a marker for the event. The usefulness of FFR-guided PCI as compared with PCI guided by angiography alone is supported by robust clinical outcome data. In the FAME 2, FFR-guided PCI plus the best medical therapy, as compared with the medical therapy alone, significantly improved clinical outcomes (4.3% vs. 12.7%; p<0.001), by decreasing the need for urgent revascularization. Even the FFR value itself has a predictive power on the lesion-related outcome; the more severe the FFR, the higher the event rate **(Figure 2)**.

Data like these led the European Society of Cardiology to give FFR its highest recommendation, Class IA, in favor of FFR-guided PCI when objective evidence of ischemia is lacking. FFR has come a long way over the last 20 years. Although recent progress in the field of invasive coronary physiology has expanded the role of pressure-derived invasive physiologic indices, FFR is still commonly proposed as an infallible gold standard for the detection of myocardial ischemia.

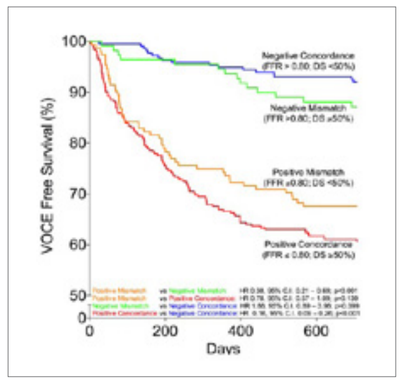


Figure 2. Kaplan-Meier survival curve of 4 groups according to the values of FFR and percent diameter stenosis (DS). Vessel-oriented clinical end point (VOCE)

TCTAP Workshops
Imaging & Physiology
›› Sunday, April 29, 2:00 PM – 3:40 PM
›› Room 104, Level 1

Visit TCTAP 2018 Master the CTO Session

In partnership with Complex Cardiovascular Therapeutics (CCT), Japan and Asian-Pacific CTO club, **learn the best approach to understand recent CTO intervention trend.**

April 29
CTO Theater (Room 103), Level 1

Master the CTO 2018

Algorithm Driven Contemporary Asia-Pacific Multicenter Registry Data

Eugene Brian Wu, MD
Prince of Wales Hospital, China

Last year, a paper introducing a new algorithm for crossing chronic total occlusions (CTO) from the Asia Pacific (AP) CTO Club was published (**Figure 1**). Since the use of the retrograde approach, algorithm-driven CTO-PCI has become widespread with reported good results, and we have examined the outcomes of retrograde versus antegrade in a multicentre CTO registry. Consecutive CTO-PCI performed by eight high volume CTO operators with an agreed CTO algorithm were examined in the registry. 485 patients with 497 CTOs were treated with technical and procedural success rates of 93.8% and 89.9%, respectively (**Figure 2**). Technical success was defined as CTO-PCI with <30% residual diameter stenosis and restoration of thrombolysis in myocardial infarction (TIMI) grade 3 flow. Procedural success was defined as technical success without in hospital major adverse cardiovascular events (MACE) including: death, myocardial infarction, target lesion revascularization, cerebral vascular accident, and tamponade requiring relief. Antegrade (54.1% of CTOs) and retrograde (45.9% of CTOs) technical and procedural success were 95.9% and 91.2% (p=0.03), and 94.4% and 84.6%, respectively (p<0.001). Pure retrograde success rate, as defined by overall technical success rate among all cases with any retrograde attempt, was 80% and pure antegrade success rate was 75%. Technical success divided by J-CTO were 100% (JCTO 0), 96.2% (JCTO 1), 95.3% (JCTO 2), and 92.5% (JCTO 3 or more). Overall in hospital MACE was 3.8% (retrograde group 6.6% vs. antegrade 1.5%) (**Figure 3**). In conclusion, the retrograde approach, when used by experienced operators, can achieve retrograde success of up to 80% in complex CTO lesions. The use of an algorithm approach may improve procedural efficiency, reduce contrast and radiation dosage. These tools remain vital to the development of future CTO-PCI.

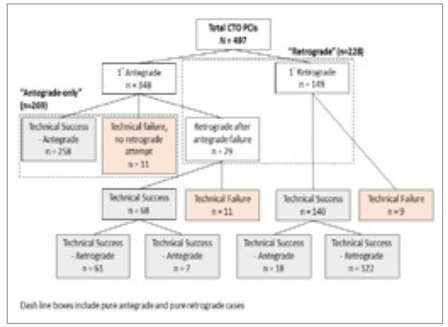


Figure 2. CTO crossing strategies – Flowchart illustrating patient flow

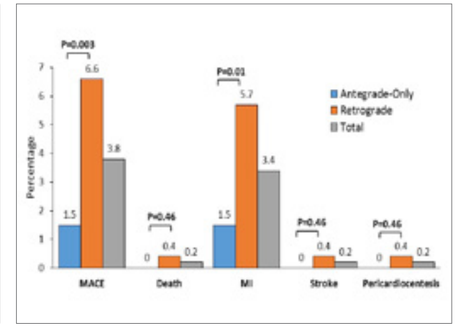


Figure 3. Outcomes – Incidence of in-hospital MACEs

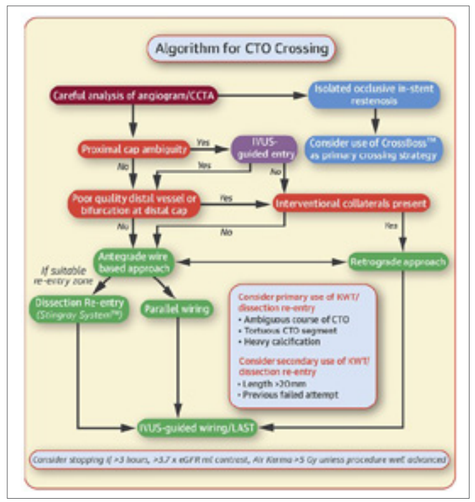


Figure 1. APCTO Club algorithm for CTO crossing

APCTO Algorithm-guided Strategy: Pitfalls and Critics

Gerald Werner, MD
Klinikum Darmstadt GmbH, Germany

Introducing algorithms to manage the ever-growing complexity in today's medical management is a way to structure our knowledge and capabilities, trying to define complex decision-making. But can we define an algorithm for a manual technique such as opening a chronic total occlusion (CTO), the most challenging of coronary procedures, that depends so much on the skill and experience of the operator? For those on a certain level, and for teaching interested operators to join the expert level, it may serve a good purpose.

The Asia Pacific CTO algorithm (APCTO) is an example of a contemporary summary of the available technical modules in a Structured approach to CTO-PCI. It starts with the emphasis of a thorough planning including multislice computed tomography (MSCT), where necessary. It differs from the American hybrid algorithm as it emphasizes wire skills and pays tribute to the advances of wire technology to allow a preservation of anatomy, including the still viable option of parallel wiring with modern high torque response wires. The rather destructive approach by the extensive use of dissection techniques is considered a bailout option. There is also no decision tree based on the apparent length of the occlusion, which is often over-estimated, and intravascular ultrasound (IVUS) is recommended to clarify proximal cap ambiguity. IVUS is also correctly included as an option to reenter from a subintimal wire position. I would, however, disagree with the suggestion of the CrossBoss device for instant reocclusion, as in these lesions, wiring is particularly easy because of the outline of the lumen by the stent struts.

The distal cap morphology and the landing zone determine the use of the retrograde approach as an initial option. There is also a special emphasis on defining the role of the knuckle wire technique in the retrograde approach for a very selective group of lesions, as in some countries the reverse CART of controlled antegrade and retrograde tracking is often confused with the retrograde technique in general. However, retrograde dissection reentry is not CART, which is a wire-based retrograde technique and which should be preferred to preserve anatomy whenever possible. In APCTO, this distinction is present but it should have been more emphasized.

There is also a recommendation on the termination of procedure based on radiation and contrast use, which are important, but I think that time limitations should not be included. If a procedure is advancing progressively in a stable patient, we should not abandon it because of some time limit. The patient deserves our full dedication as well as our time.

Master the CTO 2018
IV. APCTO Club in TCTAP

›› Sunday, April 29, 5:20 PM – 6:00 PM
›› CTO Theater, Level 1

TCTAP Workshops

DES & New BRS

Pathologic Perspective on DES and BRS: Forecasting New Directions

Aloke V. Finn, MD
CVPath Institute, Inc., USA

Problems encountered with 1st generation drug-eluting stents (DES) such as poor healing with uncovered struts and local hypersensitivity reactions, both increasing risk of stent thrombosis, continue to accrue even in 2nd generation durable polymer DES. In the RESOLUTE all-comers trial, the rate of target lesion failure (TLF) at one year was 8.3% and 8.2% for CoCr-EES and Co-Ni ZES, respectively. However, by 5 years, TLF for each stent had more than doubled to 19.1% and 20.0%, respectively. Thus, although short-term outcomes are fairly good with current generation DES, long-term freedom from stented vessel related events continues to decline. The future of DES technologies should aim to provide more durability.

One important finding within DES is the accelerated development of neoatherosclerosis compared to bare-metal stents (BMS), a process which occurs over months to years while native vessel atherosclerosis takes decades. Neoatherosclerosis is a leading cause of late stent events including restenosis and thrombosis due to plaque rupture within the stented segment. While earlier work focused on endothelial coverage as a marker of complete healing after DES, our more recent data suggest that endothelial function is equally as important, and dysfunction of these cells may be the primary cause of neoatherosclerosis. Endothelial cells (EC) control the entry of leukocytes and lipoproteins into the subendothelial space through endothelial adherens junctions. VE-cadherin mediates the integrity of EC cell-cell contacts. We recently identified a mechanism by which sirolimus promotes endothelial permeability, independent of the mTOR signaling pathway. Our experimental results in animals suggest long and continued endothelial dysfunction after DES placement and that animals with endothelial dysfunction within the stented segment are more likely to develop neoatherosclerosis in the setting of mildly elevated cholesterol levels.

Metallic stents, in which the polymers are bioabsorbable, may have an advantage in this regards as once the polymer dissolves, the drug comes out of the artery wall and the function of the endothelial cells may return. Whether this same concept applies to fully bioabsorbable devices remains unknown but may be one important advantage of this technology. As we go forward, next generation products will need to focus on the quality of healing they provide, as well as the durability of vascular responses.

Absorb was the most advanced BRS program to reach the commercial market. Unfortunately, the design limitations of this device lead to poor strut coverage and increased risk of stent thrombosis compared to CoCr-EES. In order for BRS to fulfill their promise, these devices will need to be made with a focus not only on radial strength for temporary scaffolding but also designed in such way, so that healing is not excessively delayed. If BRS are to succeed, its design has to be such that both goals are achieved.

High Bleeding Risk Patients with DES: Insights from SENIOR and LEADER-FREE Trials

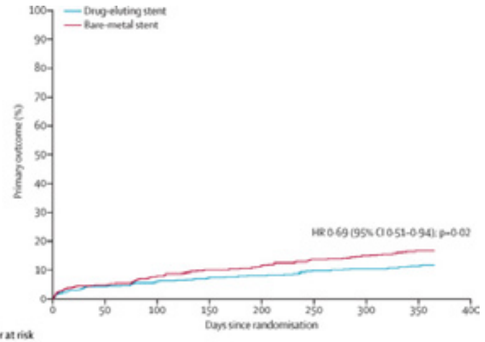
Marie-Claud Morice, MD
Institut Hospitalier Jacques Cartier, France

Patients at high bleeding risk (HBR) who require percutaneous coronary intervention (PCI) are a challenging group who need careful evaluation of both their thrombotic and bleeding risks when selecting a stent and determining the duration and intensity of antithrombotic management. Until recently, the perceived need for a very short course of dual antiplatelet treatment (DAPT) often led operators to prefer a bare-metal stent (BMS) to a drug-eluting stent (DES) for such patients.

In this context, several trials have been performed to investigate the safety and efficacy of short-term DAPT for HBR undergoing PCI. First, the LEADERS FREE trial recently showed that, together with a 1-month DAPT course, a polymer-free metallic drug-coated stent (DCS) was both safer and more effective than a BMS for patients at high risk of bleeding who were followed for 2 years. At 2 years, the primary safety endpoint had occurred in 147 DCS and 180 BMS patients (15.3%) (HR: 0.80; 95% CI: 0.64 to 0.99; p=0.039). Major bleeding occurred in 8.9% of DCS and 9.2% of BMS patients (p=0.95), and a coronary thrombotic event (myocardial infarction and/or stent thrombosis) occurred in 8.2% of DCS and 10.6% of BMS patients (p=0.045).

Very recently, the results of the SENIOR trial came out **(Figure 1)**. A total of 1,200 patients aged more than 75 years-old were randomly assigned (596 [50%] to the DES group and 604 [50%] to the BMS group). The primary endpoint occurred in 68 (12%) patients in the DES group and 98 (16%) in the BMS group (RR 0.71 [95% CI 0.52-0.94]; p=0.02). Bleeding complications (26 [5%] patients in the DES group and 29 [5%] patients in the BMS group; RR 0.90 [0.51-1.54]; p=0.68) and stent thrombosis (3 [1%] in the DES group and 8 [1%] in the BMS group; RR 0.38 [0.00-1.48]; p=0.13) at 1 year were infrequent in both groups. Thus, a strategy of combination of a DES to reduce the risk of subsequent repeat revascularizations with a short BMS-like DAPT regimen to reduce the risk of bleeding event seems like an attractive option for elderly patients who have PCI. In addition, we are waiting for the results of the new ongoing "MASTER DAPT". The major new MASTER DAPT study is set to compare within current guidelines abbreviated versus prolonged DAPT, following implantation with a drug-eluting bioresorbable polymer stent (Ultimater). Patients (n=4,300) with HBR features have been randomly assigned to one of the treatment options in 130 hospitals across 34 countries. The study primary endpoints are noninferiority for net adverse clinical events; superiority for bleeding; and noninferiority for ischemic endpoints of abbreviated versus prolonged DAPT at 1 year.

Time-to-event curves for the primary endpoint



Adapted from Lancet 2018;391:41-50

The cumulative incidence of major adverse cardiac and cerebrovascular events (MACCE) at 365 days, MACCE as a composite of all-cause mortality, myocardial infarction, ischemia-driven target lesion revascularization, or stroke.

Figure 1. Primary endpoint result from SENIOR

TCTAP Workshops
DES & New BRS
›› Sunday, April 29, 10:30 AM – 12:25 PM
›› Room 104, Level 1

TCTAP Workshops

Valves

TAVR vs. SAVR in 2018: Updated Guideline and Appropriate Use Criteria

Eberhard Grube, MD

University Hospital, Germany

In the previous AHA/ACC and ESC valve guidelines, there was recognition for the role of percutaneous interventions for treatment of severe, symptomatic aortic stenosis (AS) in patients who carried significant surgical risks. TAVR was recommended for patients with severe AS who met the indication for aortic valve replacement (AVR) with prohibitive surgical risk (Class I, level of evidence [LOE] B), and as an alternative to surgery for those with high surgical risk (Class IIa, LOE B). In the updated 2017 guidelines, the recommendation for TAVR in both high- and prohibitive-risk patients is now a Class I, LOE A **(Figure 1)**. This change is supported by multiple high-quality RCTs with multiyear follow-up that showed nonsignificant differences in mortality between TAVR and SAVR in these groups. Since the 2014 guidelines, two recent randomized trials using TAVR have also shown noninferiority endpoints in intermediate risk patients. In the PARTNER (Placement of Aortic Transcatheter Valves) IIA trial, 2,032 patients with symptomatic severe AS and intermediate-risk (Society of Thoracic Surgeons Predicted Risk of Mortality score average, 5.8%) were randomized to TAVR or SAVR. At 2 years, no significant difference was found for death (TAVR 19.3% vs. SAVR 21.1%; p=0.33), neurological events (12.7% vs. 11%; p=0.25), or pacemaker implantation (11.8% vs. 10.3%; p=0.22). Major bleeding (17.3% vs. 47%; p<0.001) and new AF (11.3% vs. 27.3%; p<0.001) were both lower in TAVR when compared with SAVR. In a prospective observational study, 1,077 patients at intermediate surgical risk (Society of Thoracic Surgeons score 5.2) were compared with 1,021 patients in the surgical arm of PARTNER 2A (Society of Thoracic Surgeons score 5.4). At 1 year, TAVR was superior to SAVR for the composite primary endpoint (all-cause mortality, stroke, or moderate-to-severe aortic regurgitation at 1 year). Evidence for discussion about TAVR versus SAVR options for those at intermediate surgical risk has changed the patient discussion. As a result, TAVR is now a reasonable alternative to SAVR for symptomatic patients with severe AS (Stage D) and an intermediate surgical risk, depending on patient-specific procedural risks, values, and preferences (Class II, LOE B-R). Studies evaluating TAVR in the low-risk population are currently ongoing. There were insufficient data at the time of publication to include this population in the 2017 updates guidelines. Of note, bicuspid, unicuspid, and noncalcified valves continue to be excluded from general recommendations for TAVR because they have been excluded from earlier trials, though there is ongoing interest in examining the role for percutaneous intervention.

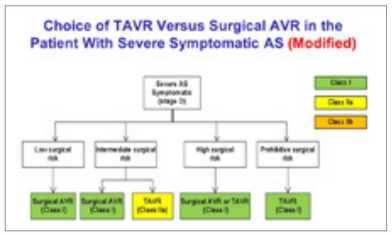


Figure 1. TAVR vs. SAVR in patients with severe symptomatic AS

Severe Secondary MR: Medical Treatment vs. Surgery vs. Intervention

Horst Sievert, MD

CardioVascular Center Frankfurt CVC, Germany

Mitral regurgitation (MR) is the most prevalent form of valve disease in developed countries, affecting ~10% of people older than 75 years of age. MR management is dependent on the cause, pathophysiology, natural history, and expected treatment efficacy. Mitral valve repair or replacement is the gold standard treatment for MR, but some studies have shown that up to one-half of the patients with severe symptomatic MR are not referred for surgery. The mortality rate in such patients reaches 50% at 5 years of follow-up and up to 90% of surviving patients had at least 1 hospitalization for heart failure within the 5 years after the diagnosis of severe MR. Lack of surgical referral is related, in part, to the perceived risk of the procedure, and an alternative, less invasive approach in vulnerable patients would be desirable. It should be noted, however, that a significant proportion of patients with severe MR suffer from secondary MR, and no strong evidence exists yet for the efficacy of any valve intervention

Continued on page 13

Hot Topics

Endovascular Symposium

First Human Results of the SELUTION Sirolimus Drug Coated Balloon in Femoral-Popliteal Disease

Robert Bersin, MD

Swedish Heart and Vascular, USA

In trials using the drug-eluting stents, superior outcomes were achieved with the use of limus (either sirolimus or everolimus). However, due to the lipophobic nature, microsphere are necessary to safety and consistently deliver the embedd-ed drug to the arterial wall. SELUTION contains micro-reservoirs made out of biodegradable polymer intermixed with sirolimus. The micor-reservoirs provide controlled and sustained release of the antiretenotic drug sirolimus, which is expected to provide a therapeutic effect in treating lesions over a prolonged period of time. The first-in-human (FIH) study of SELUTION was designed to assess the safety and efficacy of SELUTION in the treatment of lesion of the superficial femoral artery and popliteal arteries.

The study involved 50 patients enrolled across four German centers. The SELUTION FIH trial is a prospective, controlled, multicenter, open, single-arm conical trial. The primary endpoint of the study was angiographic late lumen loss (LLL) at six months. Secondary endpoints included major adverse events, primary patency, and angiographic binary restenosis.

The primary endpoint was achieved with a median LLL of the target lesion of 0.19 mm (-1.16 to 3.07), as measured by quantitative vascular angiography at 6 months after the index procedure. The target lesion revascularization (TLR) rate was 2.3% and there was no incidences of either death or need for minor and/or major amputations. In a subgroup analysis, patients with long lesion (mean, 112.05±25.31 mm) had similar safety and efficacy outcomes as the overall cohort. In this subgroup, median LLL was 0.23 mm and the TLR rate was 0%.

The results from this FIH trial of SELUTION are encouraging and showing non-inferiority of SELUTION to other FIH studies using paclitaxel balloons. The primary endpoint has been achieved, and excellent clinical outcomes have been reported despite 34% moderate or heavy calcified and diffuse long lesion.

Drug technologies for BTK Intervention: Barriers and Perspectives

Lawrence A. Garcia, MD

St. Elizabeth's Medical Center, USA

The treatment of critical limb ischemia (CLI) is in many ways distinct from the treatments for simple claudication. In one key respect, CLI patients generally have "multi-level" arterial obstructive disease. There are a myriad of technologies available to treat both occlusive and stenotic lesions. However, the use of drug-coated (anti-proliferative) technologies has not become the standard therapy in this anatomic location due to several trials that have returned with negative, and in some cases, trends toward worse outcomes with their use.

The current scientific data set suggests that drug-eluting stent (DES) technology is both safe and effective in the tibial circulation. The three principal trials, Yukon, Destiny and Achilles have shown superiority of the DES to simple percutaneous transluminal angioplasty (PTA) and bail-out bare metal stenting (BMS). The critical part to understanding these trials is that the average lesion length enrolled across these trials was merely 20 mm. So when one gets a 93% primary patency, it must be tempered on the fact that these patients were highly selected and the outcomes should also be highly specific for particular patients and not available to all patients with tibial disease.

Beyond DES technologies, the interest in drug coated balloon (DCB) technologies has been rampant with the roll-out of the above knee versions of these technologies. In the superficial femoral artery (SFA), the outcomes on lesions from 7 to 10 cm have been outstanding with two of the three technologies that we have in the United States. However, when the technology is transferred to the infra-popliteal segment, these devices have been soundly disappointing. From the IN.PACT DEEP data where the trend toward a safety concern was real at 6 months and the 12 month, patency was no different between PTA and DCB, which led to the withdrawing of this balloon from the market in 2016. In the BIOLUX data set, there was no difference in the outcomes in 72 patients randomized 1:1 between the Paseo DCB balloon and simple PTA. We currently are awaiting the outcome of the LUTONIX BTK trial.

Alternative therapies currently undergoing trial are also trying to evaluate the limus style of drug from the taxol currently available on drug coated technologies. One company, MedAlliance (Switzerland) is pursuing this and currently has enrolled its first patient using their SELUTION technology for the above knee space. Other novel technologies that are testing their approach to the tibial circulation include Proteon (USA), which uses the Bullfrog device (Merkator, USA) to infuse elastase to the adventitial wall, thereby dissolving elastin in the arterial wall removing any chance of acute vessel recoil as the artery loses this ability.

All in all the emotion of drug eluting technologies faced with the realities of either shorter lesions or frankly negative trials has placed a premium on any technology vying for the "standard of care" moniker in the tibial circulation that to date remains solely in the purview of simple balloon angioplasty.

Endovascular Therapy Versus Surgical Reconstruction in CLI: First Option Controversy

Osamu Iida, MD

Kansai Rosai Hospital, Japan

Currently, endovascular treatment (EVT) has become a common treatment strategy for critical limb ischemia (CLI) because it achieves clinical outcomes comparable to surgical reconstruction (SR), thanks to the development of recent catheter devices. However, there are a very few prospective multicenter studies especially focused on long-term outcomes directly comparing EVT and SR in this particular field.

The Surgical reconstruction versus Peripheral Intervention in pAtients with critical limb isCHemia (SPINACH) Registry was a prospective, multicenter, observational study that enrolled patients who had CLI due to atherosclerotic arterial disease, either with or without supra-inguinal disease, in 23 participating centers (12 vascular surgery departments and 11 interventional cardiology departments) in Japan. During EVT, a stent was implanted in aorto-iliac or superficial femoral lesion, as commonly as performed in clinical practice. During surgical reconstruction, an autogenous vein graft was preferably used for infra-inguinal bypass surgery, and hybrid therapy with EVT was allowed. The primary endpoint was set to be 3-year amputation-free survival (AFS), i.e., freedom from the primary event. The secondary endpoints included limb salvage, i.e., freedom from major amputation, major adverse limb event (MALE) defined as major amputation or major reintervention, and overall survival.

Between January 2012 and March 2013, a total of 550 CLI patients in whom revascularization was planned were registered. During the follow-up period, 47 patients underwent major amputation, and 230 patients died. Of the 548 registered patients, 197 had surgical reconstruction planned (surgery group), whereas the remaining 351 had EVT alone planned (EVT group). There was no remarkable difference in baseline characteristics between the matched groups. AFS was not significantly different between the two groups; the 3-year rate was 52% (95% CI: 44 to 60%) in the surgery group and 51% (95% CI: 43 to 59%) in the EVT group (p=0.408 by the stratified log rank test). Neither group had a significantly different amputation rate or survival rate. Cardiovascular death accounted for about a half of the deaths.

In conclusion, the SPINACH study, co-operatively performed by vascular surgeons and interventional cardiologists, compared the prognostic impact between current optimal surgical reconstruction and EVT for CLI patients in real-world clinical settings. We found no significant difference in the 3-year AFS between the two treatment strategies in the overall population.

Endovascular Symposium

›› Sunday, April 29, 8:30 AM – 6:00 PM
›› Endovascular Theater, Level 1

Valves

Continued from page 10

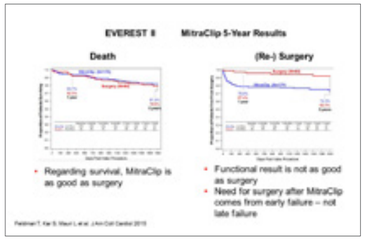


Figure 2. 5 year results of EVEREST II

in terms of survival or improvement in quality of life in such patients. Over the last decade, several transcatheter mitral valve repair technologies adapted from different surgical techniques have emerged for treating MR in patients at high- or prohibitive-surgical risk. The transcatheter mitral valve repair "tool box" is rapidly expanding, with up to 5 devices already approved in Europe, including MitraClip (Abbott Vascular, Inc.), DS1000 (NeoChord, Inc.), Carillon (Cardiac Dimensions, Inc.), CardioBand (Valtech Cardio), and Mitralign (Mitralign, Inc.). In current practice, transcatheter mitral valve repair is mainly limited to the MitraClip device. The outcomes of transcatheter mitral valve repair (TMVR) have been investigated in a number of cohort studies as well as one large randomized trial comparing transcatheter repair with surgical repair (the EVEREST II trial) **(Figure 2)**. The primary composite endpoint for efficacy was freedom from death, from surgery for mitral valve dysfunction, and from grade 3+ or 4+ mitral regurgitation at 12 months. This endpoint was more frequent in the surgery group (73% vs. 55%) due to the higher rate of subsequent surgery for mitral valve dysfunction in the TMVR group (20% vs. 2%). TMVR and mitral valve surgery were associated with similar rates of overall mortality at one year (6% for both). Grade 3+ or 4+ MR was similar in the two groups (21% vs. 20%). At 4-year follow-up, the overall rates of mortality (17.4% vs. 17.8%) and of 3+ or 4+ MR (21.9% vs. 24.7%) remained similar in the TMVR and surgical groups. However, surgery for mitral valve dysfunction was significantly higher in the TMVR group (24.8% vs. 5.5%).

TCTAP Workshops
Valves
›› Sunday, April 29, 4:30 PM – 6:00 PM
›› Room 104, Level 1

Inside TCTAP 2018: Building a New Consensus on the Way Forward

Continued from page 1

Live case transmission will showcase how the diseases are treated by top operators and provide the up-to-date expertise while covering all aspects of current issues in cardiology.

TCTAP's Core Session; Endovascular, Coronary and Valve Symposiums

TCTAP will provide the most valuable opportunities to broaden your horizons about Coronary, Endovascular, and Valve. In each area, distinguished faculties will address their ways of thinking to give in-depth insights. Moreover, they will share technical tips and tricks throughout the lectures and live case demonstrations.

TCTAP 2018 Master the CTO; Partnership with CCT and Asia-Pacific CTO Club

Master the CTO is a one-day course featuring live case demonstrations, hot topic lectures and case presentations by globally renowned experts. It offers the best approach to understand the recent development of CTO interventions and also to share technical tips and tricks.

TCTAP Workshops

This intensive one-day workshop course will take place during TCTAP 2018 to have ample time of lectures and discussions allowing leading experts from all over the world to share the cutting-edge techniques and to address latest issues related to the Imaging & Physiology, CTO, LM & Bifurcation, DES & New BRS, ACS, and Valves.

Complex Intervention Sessions

This session is specially designed for physicians who want to learn various treatment strategies in the complex intervention field. Don't miss this high-quality academic opportunity to review the newest point of view in this field, such as atrial fibrillation, heart failure, mitral valve, tricuspid valve and atrioventricular block.

Main Arena
Opening of TCTAP 2018
›› Monday, April 30, 9:20 AM - 10:00 AM
›› Main Arena, Level 3

SPOTLIGHT ON:

Late-Breaking Research from Asan Medical Center & Spotlight Major Clinical Trials with Expert's Opinion

April 30 / Room 104, Level 1

Spotlights of Major Clinical Studies with Expert Commentary

2:00 PM ~ 3:12 PM

- ABSORB III, IV, Updated Meta
- Future Expectation on Bioabsorbable Scaffolds
- DES
- TAVR
- De-Escalating Strategy
- P2Y12 Inhibitor Monotherapy
- NOAC in PCI/AF, ACS, and Stable ASCVD
- Multivessel PCI in AMI
- Cardiogenic Shock

2018 New Data from AMC; Novel and More with Expert Commentary

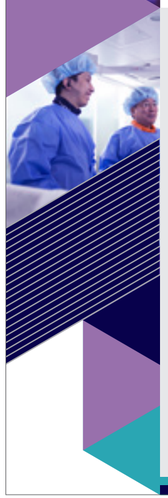
3:12 PM ~ 4:51 PM

- Treatment for Gray Zone FFR(0.76-0.80)
- MAINCOMPARE
- CTO Trial
- Contemporary DES: IRIS-DES Data
- FIMA-DEFER Trial
- Left Main PCI
- OPTIMA Trial
- Delicate CT Algorithm for Complication
- FFR

TCTAP 2018 - Featured Clinical Research from Abstracts

4:51 PM ~ 5:46 PM

- Left Main Bifurcation Intervention
- Treatment of Coronary DES Restenosis
- Transcatheter Aortic Valve Implantation
- Acute Type B Aortic Dissection: A Population-based Cohort Study
- The en-ABL e-registry



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CTO

J-CTO Score: Old-fashioned vs. Endless Updated Value

Kenya Nasu, MD

Toyohashi Heart Center, Japan

Several scoring systems have been developed to determine the likelihood of technical success of chronic total occlusion percutaneous coronary intervention (CTO-PCI) and the potential difficulty of the procedure. Multicenter CTO Registry of Japan (J-CTO) is the first scoring system for CTO-PCI. Although this scoring system is usually considered as a model to predict the difficulty of CTO-PCI in general, it was originally developed to predict the probability of successful guidewire crossing within 30 minutes.

In J-CTO score, prior failure, proximal cap morphology, tortuosity, calcification, and lesion length were used for parameters **(Figure 1)**. After clinical- and lesion-related (CL) score published in 2015, all scoring systems began to use technical success of CTO-PCI as a primary endpoint. The CL score used calcification, previous coronary artery bypass grafting (CABG), lesion length, previous myocardial infarction (MI), proximal cap morphology, and location of occluded vessel with superior performance to J-CTO score in receiver operating characteristic (ROC) curve.

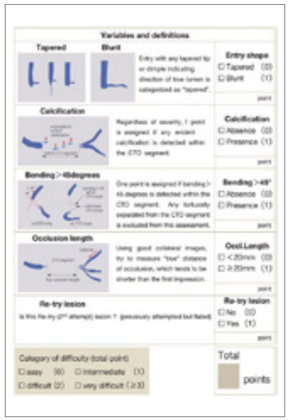

Figure 1. J-CTO score sheet

The PROGRESS CTO (Prospective Global Registry for the Study of Chronic Total Occlusion Intervention) score published in 2016 used proximal cap morphology, tortuosity, left circumflex artery (LCX) CTO, and collateral channel quality. Compared with J-CTO score, it included key valuables of the hybrid algorithm. They explained the differences of parameters that may reflect advances of CTO crossing techniques, including antegrade dissection re-entry and retrograde approach which could allow more efficient and successful crossing complex and long CTOs. Ostial, Rentrop, Age (ORA) score, also published in 2016, used only ostial location, rentrop grade, and age as parameters. However, the prediction model including those three factors was able to satisfactorily predict technical failure.

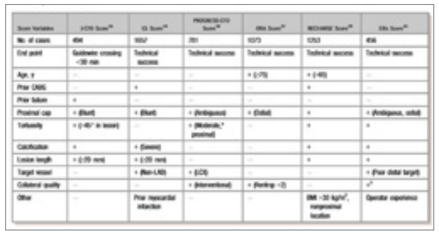

Figure 2. Summary of CTO scoring systems

The latest two scoring systems, Ellis and RECHARGE (Registry of CrossBoss and Hybrid procedures in FrAnce, the NetheRlands, BelGium, and UnitEd Kingdom), used more factors, including history of CABG, operator experience, body mass index (BMI), and so on. In addition, they used the hybrid approach as the basic wire crossing technique **(Figure 2)**.

Higher score in all scoring systems were associated with lower technical success rate of the procedure. It is useful for experienced operators to know the difficulty of CTO lesions and consider the strategy of recanalization. However, low experienced or beginning operators cannot predict their technical success from the information of those scores because the operator's skill is not always considered. In addition, the definite algorithm of CTO crossing technique has not been established yet. Therefore, the comparison between CTO scores based on different CTO crossing algorithms includes significant bias. Thus, educational system of CTO-PCI should be considered in parallel with evolving of those CTO scoring systems. In conclusion, currently available scoring systems use various clinical and angiographic characteristics for analysis and can provide an assessment of the likelihood of success and the difficulty of the cases. CTO scores may be effective for scheduling procedure and preventing complication.

Pitfall of J-CTO Score: Same Score, Different Strategy

Satoru Otsuji, MD

Higashi Takarazuka Satoh Hospital, Japan

Multicenter CTO Registry of Japan (J-CTO) score was advocated in 2011 by the Japanese multicenter CTO registry and has been one of the standard grading systems to assess difficulty of chronic total occlusion percutaneous coronary intervention (CTO-PCI). The investigators extracted five angiographic factors that affect procedural success and established a grading system by adding each factor. The grading system consists of grade 0 (easy) to grade 3 (very difficult) and shows a clear relationship between this scoring system and 30-min wire passage, as well as procedural success **(Figure 1)**.

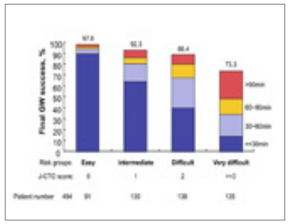

Figure 1. Probability of success of the procedure in each risk category by J-CTO score

The analysis of Retrograde Summit (one of the CTO-PCI registries in Japan) data showed that procedural success gradually decreased as the score increased. They also investigated the ratio of retrograde procedure which was not referred to in the J-CTO score study and found out that the ratio increased as the score increased **(Figure 2)**. Almost half of procedure was done via the retrograde approach in very difficult cases, while retrograde procedure was not done even by a handful in easy cases.

Figures 3, 4 and **5** show two cases of left anterior descending artery (LAD) CTO. These two CTO lesions had identical J-CTO score of 0 (easy group), however, quite different procedures were performed. Antegrade single wire procedure with GAIA second was successful in the first case, and the time for wire passage took 22 minutes. However, in the second case, the antegrade approach failed even via parallel wire technique using GAIA second (same as the first case), and the retrograde approach had to be performed. The total time for wire passage took 107 minutes. The main difference between these cases is the visibility of distal reference lumen during the procedure **(Figure 6)**. Retrograde Summit data showed that significant proportion of CTO lesions had blunt and/or unclear distal CTO exit **(Figure 7)**. Therefore, an algorithm like that from the AP-CTO Club will be useful to build an efficient strategy of CTO-PCI.

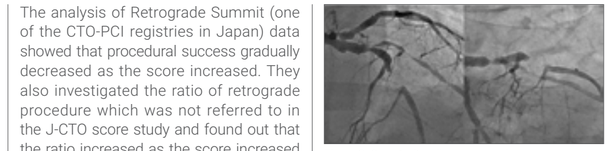

Figure 2. Retrograde Summit: Procedural success based on J-CTO score

Figure 3. Case 1 - Baseline angiography

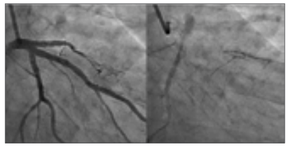

Figure 4. Case 2 - Baseline angiography

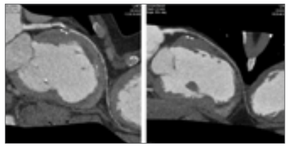

Figure 5. Coronary CTA findings of the two cases of LAD-CTO

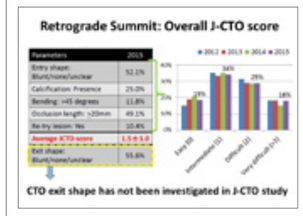

Figure 6. Similarities and difference

Figure 7. Data from the Retrograde Summit

TCTAP Workshops
CTO
›› Saturday, April 28, 12:00 PM – 2:00 PM
›› Room 105, Level 1

Left Main, Bifurcation PCI

PCI vs. CABG for Left Main in 2018 Expert's View on U.S. Future Guideline Change

David R. Holmes, MD

Mayo Clinic, USA

For management of stable angina, the goals for quality of life should be improved. Currently, left main coronary artery (LMCA) disease is the only lesion subset for which revascularization is unequivocally accepted as improving survival over medical therapy. Indeed, LMCA comes in many flavors of lesions and patient subsets. Thus, treatment shall be individualized and optimized.

There have been attempts to compare percutaneous coronary intervention (PCI) and coronary artery bypass graft (CABG). Through pooled analysis of individual patient-level data of LMCA disease in PRECOMBAT and SYNTAX, long-term outcome in specific anatomic group at 5 years was assessed. For this study, a total of 1,305 patients (657 for PCI and 648 for CABG) were enrolled. The 5-year clinical outcomes showed that there was a higher rate of repeat revascularization (p<0.001) and similar rate of death, MI, and stroke in patients with SYNTAX score ≥33.

The EXCEL trial, a large-scale, multinational, randomized controlled trial (RCT), examined PCI versus CABG in patients with LMCA disease and low or intermediate SYNTAX scores. The results revealed that there was no significant difference in the 3-year outcomes, with a reduction in 30-day major adverse events with PCI.

Another large RCT-NOBLE trial showed that there were higher rates of major adverse cardiac and cerebrovascular events (MACCE) in PCI, as well as non-procedural myocardial infarction and any revascularization.

In this session, Dr. David R. Holmes will introduce the general concept of stable angina and LMCA disease management, and detailed findings from the EXCEL and NOBLE trials. He will present advantages of PCI and its potential as a reasonable alternative to CABG, along with updates on current guidelines.

TCTAP Workshops
Left Main and Bifurcation PCI
›› Sunday, April 29, 8:30 AM – 10:30 AM
›› Room 104, Level 1

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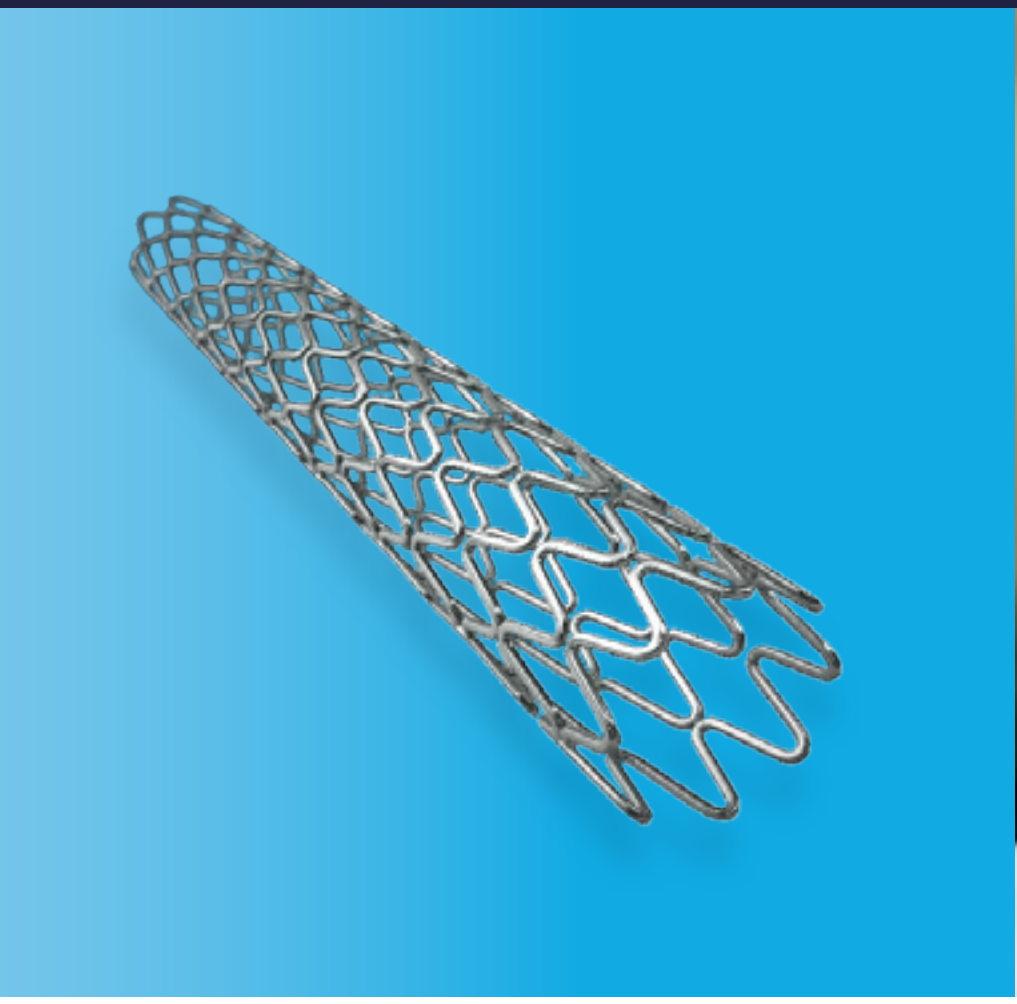

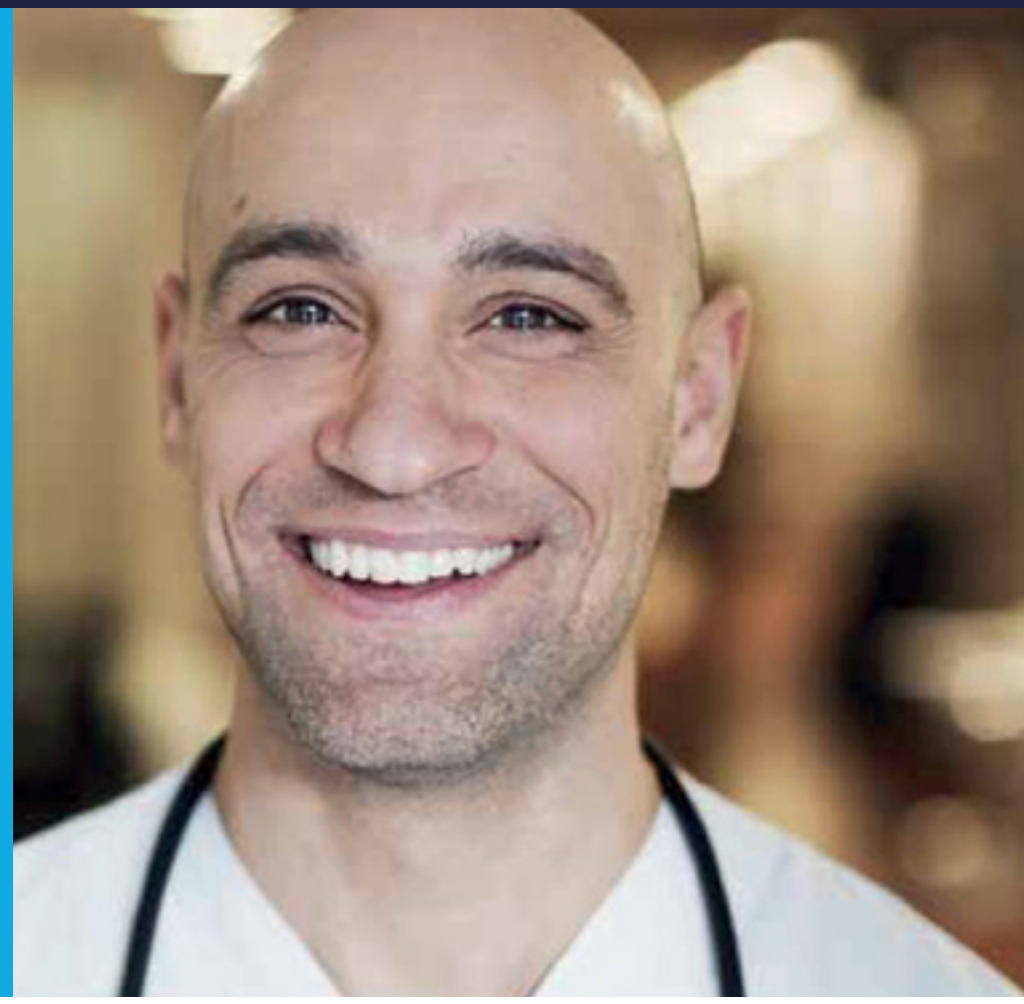

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