CardioVascular Summit
TCTAP Daily

Wednesday, April 29, 2015

1

Today's Highlights

Live Case Session - USA
8:15 AM - 9:25 AM
Main Arena, Level 3

Opening of TCTAP 2015
9:25 AM - 10:00 AM
Main Arena, Level 3

Endovascular Symposium
10:00 AM - 6:00 PM
Endovascular & Structural Heart Theater, Level 1

TCT@TCTAP 2015
10:15 AM - 12:30 PM
Main Arena, Level 3

Coronary Session
2:00 PM - 6:00 PM
Coronary Theater, Level 1

Imaging & Physiology Summit
2:00 PM - 4:30 PM
Coronary Theater, Level 1

QICC@TCTAP 2015
2:00 PM - 4:30 PM
Room 105, Level 1

Moderated Competition Session
2:00 PM - 6:00 PM
Exhibition Hall, Level 1

DES & BVS
4:30 PM - 6:00 PM
Room 104, Level 1

Masters' Video Live Session I
4:30 PM - 6:00 PM
Room 105, Level 1

Inside this Issue

Interview: Founder and Course Director, Seung-Jung Park, on the 20th Anniversary of TCTAP

Seung-Jung Park, MD, is the founder of CVRF and course director of TCTAP. CVRF is a professional organization consisting of medical professionals and administrators who are focusing on research and education.

Q. What brought you to start this conference? And what were the top things you set out to accomplish? How did it go?

Since the first percutaneous transluminal angioplasty was performed in 1977, interventional cardiology has experienced a lot of advances and achievements. The 1990s were a major growth period for the field of interventional cardiology when I worked as an assistant professor of medicine in Korea. At that time, however, there were very limited options available for Asian physicians to be exposed to the latest techniques and data and to present their research outcomes compared to developed countries, such as the US and Europe. However, the world of medical science in Asia has experienced many changes and substantial growth, and in response to the increasing needs of education and advanced clinical and research training opportunities in specialized areas, I've decided to launch this meeting for Asian physicians with Seung-Wook Park, MD, who is currently serving as president and CEO of the Asan Medical Center. When I first started this meeting, I set the bar high: I wanted to make the most desirable and effective place for everyone, especially Asians involved in the field of interventional cardiology, and to provide the best learning and global networking opportunity.

Q. How do you think the conference has changed over the years?

One obvious change is size. For last two decades, TCTAP has grown both in size and in academic quality of education. In 1995, the first year of this meeting, we had less than three hundred attendees, mostly Koreans. But now it has become one of the must-attend conferences which attracts about four thousand attendees from more than 50 countries. There has also been a surge in collaboration between TCTAP and other medical centers and groups across the world. Partnering with those different countries allows attendees to expose themselves to a higher level of education opportunities and to experience multiple perspectives. Another change is faculty. Now, more than one thousand faculty members have contributed in various ways. They have played a vital role in this meeting and helped make this meeting the best educational meeting in Asia Pacific by sharing their expertise and experience openly.

Q. In the last 20 years, which year/person was your favorite and most memorable? Why?

I have grown up with this meeting for the last 20 years so each year and every single person I ever met here were so memorable and meaningful to me. From the beginning, there has been a lot of help and support from colleagues, partners and teachers, including all CRF members, especially Gary S. Mintz, MD, who has joined this meeting since 1997, Spencer B. King, III, MD, and Alan C. Yeung, MD. Of course the staff of the Asan Heart Institute and CVRF team has inspired me a lot to keep pushing toward my goals. I must say that without them, this meeting would never achieve such success. I would like to take this opportunity to thank the many individuals for their contributions and willingness to share.

Q. What do you hope to accomplish with TCTAP?

I hope to reinvigorate motivation. My team and I realized that we've come a long way, but there is still more to go. For the last few years, the field of interventional cardiology has experienced dramatic innovation in terms of medical treatment for patients. Even in some fields, Asia leads the way. The intent of this meeting is to lead in innovation by our unceasing efforts to provide exceptional education and training opportunities, and by encouraging scientists and practitioners from around the globe to perform and share their best practices and clinical outcomes and summing up their experiences. I hope the diversity and commitment to education and training provides a snapshot of approaching the goal.

Meeting Information

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

Certificate of Attendance
- **Level 1, Registration Booth**
  Certificate of Attendance for TCTAP 2015 will be distributed along with badges.

Conference Bag Pick-up
- **Level 1, Exhibition Hall**
  Wednesday, April 29 7:00 AM – 7:00 PM
  Thursday, April 30 7:00 AM – 7:00 PM
- **Level 1, Registration Booth**
  Friday, May 1 6:00 AM – 12:30 PM

CVRF Booth (Organizing Secretariat)
- **Level 1, Grand Ballroom Lobby, CVRF Booth**
  Wednesday, April 29 6:00 AM – 7:00 PM
  Thursday, April 30 6:00 AM – 7:00 PM
  Friday, May 1 6:00 AM – 12:30 PM

Cyber Station
- Level 1, Grand Ballroom Lobby, CVRF Booth
- Level 1, B2 Hall, Exhibition Lounge

Exhibition
- **Level 1, B2 Hall, Exhibition Hall**
  Wednesday, April 29 9:00 AM - 6:00 PM
  Thursday, April 30 9:00 AM - 6:00 PM

Faculty Lounge
- **Invited Faculty Lounge: Level 2**
- **Faculty of the Year Lounge: Level 1, B2 Hall Lobby**
  Wednesday, April 29 6:00 AM - 7:00 PM
  Thursday, April 30 6:00 AM - 7:00 PM
  Friday, May 1 6:00 AM - 12:30 PM

Free Mobile Recharge
- Level 1, Grand Ballroom Lobby, CVRF Booth
- Level 1, B2 Hall, Exhibition Lounge
- Level 1, B2 Hall Lobby, Registration Lounge

Happy Hour
- Level 1, B2 Hall, Exhibition Lounge
- Wednesday, April 29 3:00 PM
- Thursday, April 30 10:00 AM & 3:00 PM

Information Desk
- Level 1, Grand Ballroom Lobby, CVRF Booth
- Level 3, Main Arena Lobby

Learning Center
- Level 1, B2 Hall, Exhibition Lounge
- Level 2, Room 209 & 210

Lost and Found / Coat Room
- Level 1, B2 Hall Lobby, Coat Room (Next to the Registration Booth)

Prayer Room
- **Level 2, Room 202A**
  Wednesday, April 29 - Thursday, April 30
  8:00 AM - 6:00 PM

Preview Room (Slide Upload)
- **Level 2, Room 208**
  Wednesday, April 29 6:00 AM - 7:00 PM
  Thursday, April 30 6:00 AM - 7:00 PM
  Friday, May 1 6:00 AM - 12:30 PM

Registration
- **Level 1, B2 Hall Lobby, Registration Booth**
  Wednesday, April 29 6:00 AM - 7:00 PM
  Thursday, April 30 6:00 AM - 7:00 PM
  Friday, May 1 6:00 AM - 12:30 PM

Wi-Fi Zone
- Level 1 - Coronary Theater, Endovascular & Structural Heart Theater, Room 104 & 105, CVRF Lounge, Exhibition Hall, Faculty of the Year Lounge, Registration Booth
- Level 2 - Invited Faculty Lounge, Preview Room
- Level 3 - Main Arena

Celebratory Messages from Participants

Congratulations on the 20th anniversary of one of the most useful & practical PCI imaging meetings! You have truly helped advance my practical knowledge.

Fantastic event, excellent audiovisual. Great Speakers. Overall, what an event!

All the best for TCTAP 2015. Gradually, the TCTAP programs are showing the highest level of performance in the field of interventional cardiology.

TCTAP will be the best interventional cardiology conference in the Asia Pacific region.

Bigger and bigger, better and better. I appreciate coming every year.

Wish you good luck on helping make the world's cardiologists more updated.

Congratulations and I hope this will be a great meeting forever.

We cordially invite you to

ACT Tour @ Asan Medical Center

» Program
- Live Case Demonstration, Presentation and Q&A
- Tour of Cath lab, CCU and Other Facilities

» Schedule
- Tour 1 : April 29 (Wed) at 4 PM
- Tour 2 : April 30 (Thu) at 10 AM
- Tour 3 : April 30 (Thu) at 4 PM

* Each tour will be limited up to 12 people.

» Onsite registration & Pick-up Place
ACT Desk at CVRF Booth
(Level 1 Lobby, COEX)

For more information, visit www.cvrf.org/act

TCTAP Wrap-up Interview

30-minute moderated interview sessions in an open studio at Level 2 on selected key topics in the field of vascular medicine with world's leading experts.

More specific information continued on page 16

Today's Programs: Wednesday, April 29

Main Arena

8:15 AM - 12:30 PM

Main Arena, Level 3

Live Case Session - USA

Transmitted from Columbia University Medical Center, New York, USA

8:15 AM - 9:25 AM

Opening of TCTAP 2015

9:25 AM - 10:00 AM

TCTAP Award 2015

"Master of the Masters"

10:00 AM - 10:15 AM

TCT @ TCTAP 2015:

Controversies and Hot Topics

10:15 AM - 12:30 PM

Coronary Theater

2:00 PM - 6:00 PM

Coronary Theater, Level 1

Live Case Session I

2:00 PM - 3:00 PM

Coronary Session I

3:00 PM - 3:36 PM

Live Case Session II

3:36 PM - 4:36 PM

Coronary Session II

4:36 PM - 5:00 PM

Live Case Session III

5:00 PM - 6:00 PM

Endovascular Symposium

10:00 AM - 12:30 AM / 2:00 PM - 6:00 PM

Endovascular & Structural Heart Theater, Level 1

Live Case Session I.

Complex Cases Intervention: SFA

10:00 AM - 11:30 AM

I. Featured Lectures

11:30 AM - 12:30 PM

II. SFA Intervention

2:00 PM - 3:00 PM

Live Case Session II. SFA Intervention

3:00 PM - 4:00 PM

III. Below the Knee Intervention

4:00 PM - 5:00 PM

Live Case Session III.

Below the Knee Intervention

5:00 PM - 6:00 PM

Focused Workshops

2:00 PM - 6:00 PM

Room 104, Level 1

Imaging & Physiology Summit

2:00 PM - 4:30 PM

DES & BVS

4:30 PM - 6:00 PM

Masters' Video Live Session I: Case-Based Learning

Complex Lesion PCI I

4:30 PM - 6:00 PM

Room 105, Level 1

Partnership Session with International Society

QICC @ TCTAP 2015

Co-organized by QICC

2:00 PM - 4:30 PM

Room 105, Level 1

Morning Roundtable Forum: Meet the Experts Over Breakfast

7:00 AM - 8:10 AM

Chronic Total Occlusion

Organized by CVRF

Endovascular & Structural Heart Theater, Level 1

Bioresorbable Vascular Scaffolds

Organized by CVRF and Supported by Educational Grant from Abbott Vascular

Coronary Theater, Level 1

Issues and Debates in ACS

Organized by CVRF

Room 104, Level 1

Bifurcation PCI

Organized by CVRF

Room 105, Level 1

Devices, Techniques, and Clinical Data: LAA and MV Clip

Organized by CVRF and Supported by Educational Grant from Boston Scientific

Room 203, Level 2

Lunchtime Activities

12:45 PM - 1:45 PM

Advancing Cardiology with Innovative Technologies

Organized by CVRF and Supported by Educational Grant from Boston Scientific

Endovascular & Structural Heart Theater, Level 1

The 4th Revolution in PCI (Bioresorbable Vascular Scaffolds)

Organized by CVRF and Supported by Educational Grant from Abbott Vascular

Coronary Theater, Level 1

Leaving Nothing Behind: From Bioabsorbable Polymer DES to a Fully Absorbable Metallic Scaffolds

Organized by CVRF and Supported by Educational Grant from BIOTRONIK

Room 104, Level 1

New Generation EVT Stent

Organized by CVRF and Supported by Educational Grant from Terumo Korea Corporation

Room 105, Level 1

MSD Satellite Symposium

Organized by CVRF and Supported by Educational Grant from MSD Korea

Room 203, Level 2

Proven Long-term SFA Results

Organized by CVRF and Supported by Educational Grant from Cook Medical

Room 1A, Level 3

Plavix Luncheon Symposium

Organized by CVRF and Supported by Educational Grant from SANOFI Korea

Room 2A, Level 3

Evening Symposium

Risk Awareness of Secondary Events in Post MI Patients and Secondary Prevention

Organized by CVRF and Supported by Educational Grant from Astrazeneca Korea

6:00 PM - 8:00 PM

Room 104, Level 1

Moderated Oral Abstract Competition I, II

2:00 PM - 6:00 PM

Abstract Zone I & II, Level 1

Moderated Complex Case Competition I, II, III

2:00 PM - 6:00 PM

Case Zone I & II & III, Level 1

Live Case Transmission from World-renowned Medical Centers

Asan Medical Center, Seoul, South Korea

- April 29 - 30, Coronary Theater, Level 1

Columbia University Medical Center, New York, USA

- April 29, 8:15 AM – 9:25 AM, Main Arena, Level 3
- Operators: Dimitrios Karmpaliotis, Jeffrey W. · Moses, Martin B. Leon, Tamim Nazif

Fu Wai Hospital, Beijing, China

- April 30, 11:00 AM – 12:00 PM, Coronary Theater, Level 1
- Operators: Runlin Gao, Jie Qian, Shubin Qiao, Yongjian Wu, Yuejin Yang

University Hospital Bonn, Bonn, Germany

- April 30, 3:30 PM – 4:30 PM, Coronary Theater, Level 1
- Operators: Christoph Hammerstingl, Fritz Mellert, Georg Nickenig, Jan-Malte Sinning, Mariuca Vasa-Nicotera, Armin Welz, Nikos Werner

Imaging and Physiology Summit

"The integrated use of physiology and imaging" is an important topic of TCTAP 2015. Globally distinguished researchers presented many interesting lectures.

Diagnosis and Treatment of Vulnerable Plaque: What Is New in 2015?

Renu Virmani, MD
CVPath Institute, Inc.

Dr. Renu Virmani from CVPath Institute discussed the pathologic perspective of vulnerable plaque and emphasized risk stratification. Patients with acute coronary syndromes classically present with unstable angina, acute myocardial infarction, or sudden coronary death. In approximately 50-60% of sudden coronary deaths, the culprit lesion exhibits an acute coronary thrombus, whereas the remainder of these cases includes stable coronary plaques with greater than 75% cross-sectional area luminal narrowing. The thin cap fibroatheroma (TCFA) (vulnerable plaque) is originally developed from observations of ruptured coronary lesions where the sole distinguishing morphological feature relative to rupture is the absence of a luminal thrombus. TCFA generally exhibits relatively large necrotic cores with an overlying thin, intact fibrous cap. The onset of symptoms and life-threatening complications therefore depend not only on the severity of narrowing in stable chronic anatomic disease, but also on critical dynamic morphological changes in coronary plaque in the arterial wall. In pathological studies, more than two-thirds of acute coronary events were related to the rupture of lipid-rich, voluminous, and outwardly remodeled plaques covered by attenuated and inflamed (macrophage rich) fibrous caps. Plaque erosion is responsible for most of the remaining events; the eroded plaques usually do not demonstrate much lipid burden, do not have thin fibrous caps, are not positively remodeled, and are not critically narrowed. Invasive and non-invasive imaging studies have demonstrated that plaque characteristics of low density plaque (MCT angiography), which corresponds with a large area of the necrotic core, are predictive of ACS. Both IVS and MCT can be used to define positive remodeling and only optical coherence tomography (OCT) with high resolution can be used to identify fibrous cap thinning and macrophage infiltration, which collectively define high risk plaques that are likely to rupture (Figure 1).

Gary S. Mintz, MD
Cardiovascular Research Foundation

Subsequently, Dr. Gary Mintz spoke about the intracoronary imaging of vulnerable plaque based on the PROSPECT, ATHEROREMO, and VIVA study. The PROSPECT trial evaluated the natural history of coronary atherosclerosis using VH-IVUS to identify the clinical and lesion-related factors that place patients presenting with acute coronary syndrome at risk for adverse cardiac events. In this study, they found that nonculprit lesions associated with recurrent events were more likely than those not associated with recurrent events to be characterized by a plaque burden of 70% or greater (hazard ratio, 5.03; 95% confidence interval [CI], 2.51 to 10.11; $p<0.001$) or a minimal luminal area of 4.0 mm^2 or less (hazard ratio, 3.21; 95% CI, 1.61 to 6.42; $p=0.001$) or to be classified on the basis of radiofrequency intravascular ultrasonography as thin-cap fibroatheromas (hazard ratio, 3.35; 95% CI, 1.77 to 6.36; $p<0.001$). In contrast to the PROSPECT study, the ATHEROMO study evaluated the prognostic value of *in vivo* detection of high-risk plaques by IVUS in patients undergoing coronary angiography for ACS or stable angina. Between November 2008 and January 2011, IVUS of a non-culprit coronary artery was performed in 581 patients who underwent coronary angiography for ACS (n=318) or stable angina (n=263). In this study, the presence of IVUS virtual histology-derived

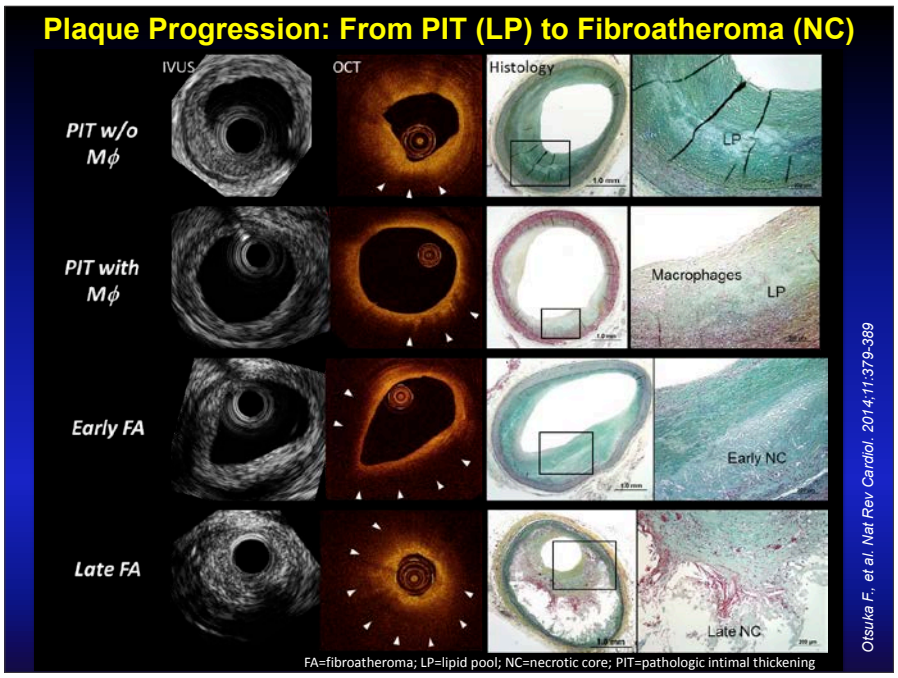


Figure 1. Plaque progression from pathologic intimal thickening to fibroatheroma.

thin-cap fibroatheroma (TCFA) lesions (present 10.8% vs. absent 5.6%; adjusted HR: 1.98, 95% CI: 1.09-3.60; *p*=0.026) and lesions with a plaque burden of ≥70% (present 16.2% vs. absent 5.5%; adjusted HR: 2.90, 95% CI: 1.60-5.25; *p*<0.001) were independently associated with a higher MACE rate. Thin-cap fibroatheroma lesions were also independently associated with the composite of death or ACS only (present 7.5% vs. absent 3.0%; adjusted HR: 2.51, 95% CI: 1.15-5.49; *p*=0.021). Thin-cap fibroatheroma lesions with a plaque burden of ≥70% were associated with a higher MACE rate within (*p*=0.011) and after (*p*<0.001) 6 months of follow-up, while smaller TCFA lesions were only associated with a higher MACE rate after 6 months (*p*=0.033). Similarly, the VIVA study also demonstrated that VH-IVUS TCFA was associated with nonrestenotic and total MACE on individual plaque analysis, and noncalcified VHTCFA was associated with nonrestenotic and total MACE on whole-patient analysis. This demonstrates that VH-IVUS can identify plaques at increased risk of subsequent events.

Ik-Kyung Jang, MD
Massachusetts General Hospital

Dr. Ik-Kyung Jang presented the importance of plaque erosion as a cause of coronary thrombosis using optical coherence tomography. OCT is a promising new intracoronary imaging modality which has been safely and effectively integrated into coronary procedures in the modern cardiac catheterization laboratory. The high resolution imaging afforded by OCT has provided valuable insights into the plaque characteristics underlying vulnerable plaques and acute coronary syndromes (ACS) pathophysiology. Recently, OCT has made it possible to differentiate three different underlying mechanisms of ACS *in vivo:* plaque rupture, plaque erosion, and protruding calcific nodule. This new discovery may lead to individualized therapy for over two million patients with ACS around the world. In his recent study, Dr. Jang characterized the morphological features of plaque erosion and its clinical importance. In 126 ACS patients, he found that OCT-erosion is a frequent finding in patients with ACS, especially in those with NSTE-ACS and younger patients. OCT-CN is the least common etiology for ACS and is more common in older patients. (Figure 2).

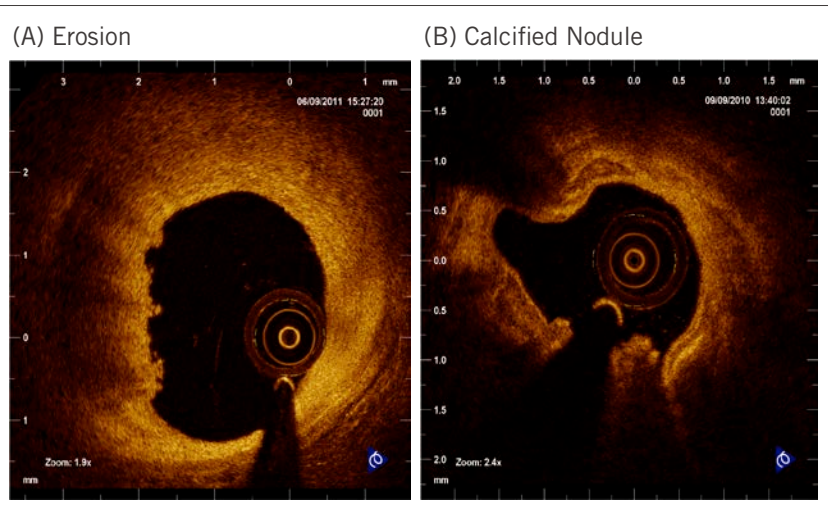


Figure 2. OCT findings of plaque erosion and calcified nodule

James E. Muller, MD
Infraredx, Inc.

Dr. James E. Muller introduced a new promising modality to detect vulnerable plaque. Near-infrared spectroscopy (NIRS) has been used for atherosclerotic plaque imaging and has been found to accurately detect the lipid content of human atherosclerotic plaques. NIRS received US Food and Drug Administration approval for the detection of lipid core coronary plaques in 2008. NIRS provides a "chemogram" of the wall of the coronary artery and aims to detect lipid-rich plaques. Target lesions responsible for acute coronary syndromes are frequently composed of lipid core plaque with a high lipid core burden index (LCBI). Therefore, NIRS is likely to become a sensitive modality for coronary plaque characterization. NIRS could be an interesting tool to investigate novel lipid-modulating and other cardiovascular therapies aiming to prevent adverse coronary events (Figure 3).

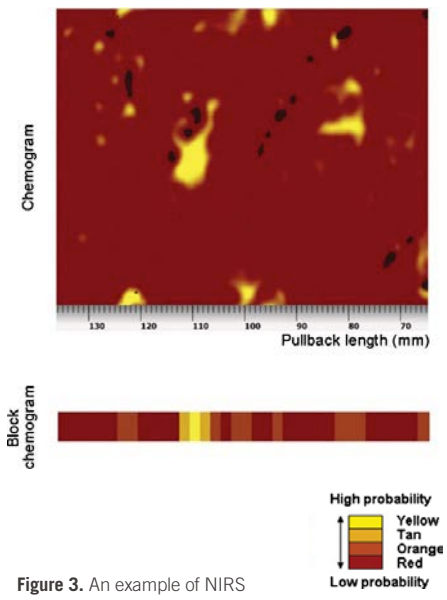
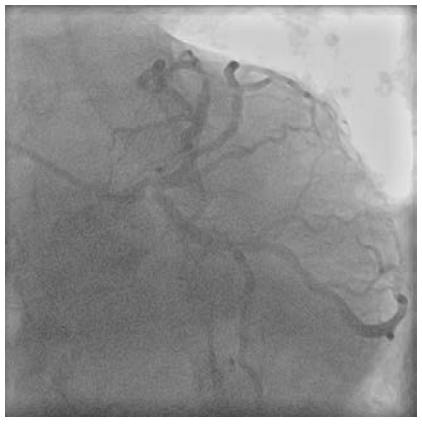


Figure 3. An example of NIRS

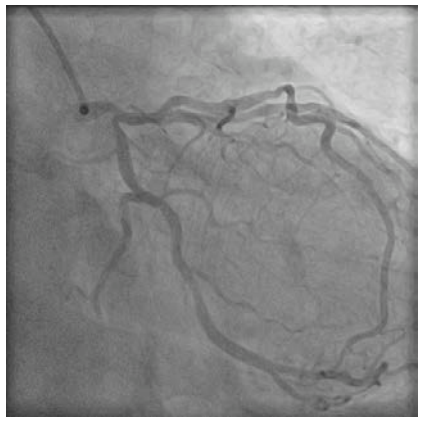
Dr. Seung-Jung Park introduced a very interesting study called the PREVENT study. Current guidelines recommend ischemia guided revascularization, which requires the presence of objective evidence of ischemia prior to revascularization. The non-ischemia producing lesion is usually treated by optimal medical treatment. However, half of clinical events occur at

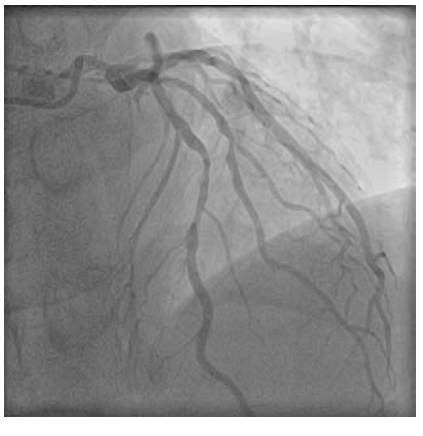
Continued on page 6

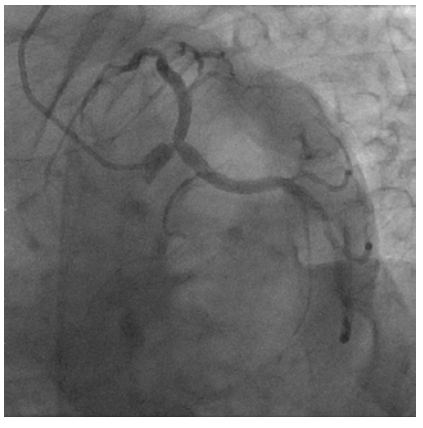
Today's Hot Lives



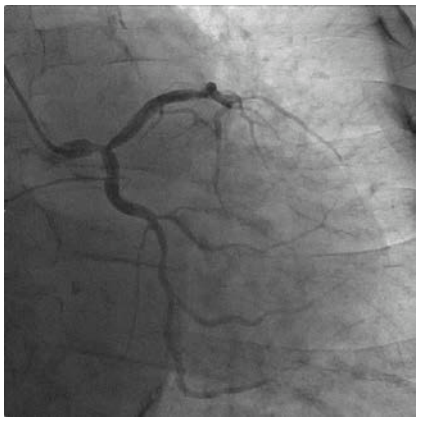
Q A 71-year-old male was referred for an effort related angina and shortness of breath for 4 months. Echocardiography showed normal LV systolic function without regional wall motion abnormality. Thallium-201 SPECT imaging detected a reversible perfusion defect in the LCX territory. How would you treat this LM bifurcation lesion which includes tight stenosis of LCX ostium? What would you do with the remaining lesion in LAD?

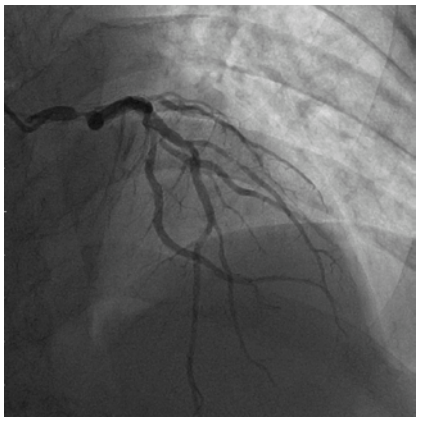






Q A 64-year-old male underwent PCI for LCX and RCA stenosis at a local medical center 1 year ago. His chest pain recurred recently and was referred to our hospital for proper management of the critical LM disease involving bifurcation. So, what would be the 'proper' treatment for this lesion?





Answers on next issue

Xience

Xpedition

Everolimus Eluting
Coronary Stent System

The Only **3.25mm** Xience Xpedition

20th CARDIOVASCULAR SUMMIT
TCTAP 2015

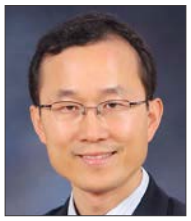
CVRF
CardioVascular Research Foundation

Abbott Vascular

KR CP0008-EN 04/15

Seung-Jung Park, MD
Asan Medical Center

sites with functionally non-significant stenoses prior to becoming a culprit lesion. Several anatomical features detected by intracoronary imaging modalities have been identified as high risk characteristics. Therefore, there was no data about appropriate treatment for functionally insignificant stenosis with vulnerable characteristics. Since the absorption and vascular remodeling of bioresorbable vascular scaffold (BVS) appear to seal coronary plaques, the implantation of BVS in functionally insignificant but vulnerable plaques could be a means to prevent future events. Dr. Park hypothesized that BVS implantation in non-flow-limiting lesions that show signs of vulnerability could prevent future coronary events from arising in suspected vulnerable plaque. Therefore, he planned a prospective, randomized trial to determine whether BVS implantation on functionally insignificant coronary stenoses with vulnerable plaque characteristics plus optimal medical therapy reduces the incidence of composite cardiovascular death, nonfatal myocardial infarction, or unplanned rehospitalization due to unstable angina compared with optimal medical therapy alone (Figure 4).



Bon-Kwon Koo, MD
Seoul National University Hospital

possesses unique anatomic and physiologic characteristics. The amount of myocardium supplied by side branch is relatively small and variable; eccentric distribution of plaque usually accompanies side branch narrowing and negative remodeling. The mechanism of luminal narrowing of jailed side branch is very heterogeneous and the coronary flow patterns through the main vessel and side branch is dynamically changed during intervention. Previous studies have shown that angiographic evaluation is relatively inaccurate and overestimates the functional significance of bifurcation lesions. Fractional flow reserve (FFR) is an epicardial stenosis-specific physiologic index and can be used in a catheterization laboratory to assess the presence of myocardial ischemia. FFR can simplify the complex procedure for the bifurcation lesion, especially for the jailed side branch after main vessel stenting. Several studies have consistently shown that the limitations of angiographic % diameter stenosis in identifying functionally significant jailed side branches can be overcome by FFR interrogation. FFR-guided treatment for bifurcation lesions has consistently shown comparable outcomes to angiography-guided treatment with less intervention. However, clinical application of FFR in bifurcation lesions needs comprehensive understanding of coronary physiology and its pitfalls. In addition, FFR should be interpreted as an integrated unit of each component of bifurcation lesions along with consideration of dynamically changing parameters rather than simple constant. Finally, it should be kept in mind that the most important thing is the ischemic burden rather than the presence of ischemia itself and the benefit of revascularization over the risk of intervention process. Dr. Koo concluded that we should be more physiologic than FFR.

William F. Fearon, MD
Stanford University Medicine Center

Dr. William F. Fearon introduced the ongoing clinical trial, FAME 3. Clinical guideline recommends coronary artery bypass graft surgery (CABG) over percutaneous coronary intervention (PCI) for patients with multivessel coronary artery disease (MVD), defined as angiographically significant disease involving all three major epicardial vessels. This recommendation is based primarily on the SYNTAX study. In addition, the FREEDOM trial and the more recent BEST trial support these guidelines. However, the lack of FFR-guided PCI should be the limitation of these studies. Therefore, Dr. Fearon planned the ultimate comparison between FFR-guided PCI with the Resolute stent and CABG in patients with multivessel coronary disease.

Non-Invasive Imaging

Manesh Patel, MD
Duke University Medical Center

Dr. Manesh Patel presented the critical role of CT coronary angiography based on the results of the PROMISE trial. The PROMISE trial was a prospective randomized study to compare health outcomes in patients who presented with new symptoms suggestive of CAD that required further evaluation and those who were randomly assigned to an initial strategy of anatomical testing with the use of CT coronary angiography or to functional testing. The primary hypothesis of the study was that the clinical outcomes in patients assigned to anatomical testing with the use of CT coronary angiography would be superior to those in patients assigned to functional testing. They found that over a median follow-up period of 25 months, a primary endpoint event occurred in 164 of 4996 patients in the CTA group (3.3%) and in 151 of 5,007 patients (3.0%) in the functional testing group (adjusted hazard ratio, 1.04; 95% confidence interval, 0.83 to 1.29; *p*=0.75, Figure 6). CT coronary angiography was associated with fewer catheterizations, showing no obstructive CAD than functional testing (3.4% vs. 4.3%, *p*=0.02), although more patients in the CT coronary angiography group underwent catheterization within 90 days after randomization (12.2% vs. 8.1%). Therefore, they concluded that in symptomatic patients with suspected CAD who required noninvasive testing, a strategy of initial CT coronary angiography, as compared with functional testing, did not improve clinical outcomes over a median follow-up of 2 years.

Wednesday, April 29, 2:00 PM - 4:30 PM, Room 104, Level 1

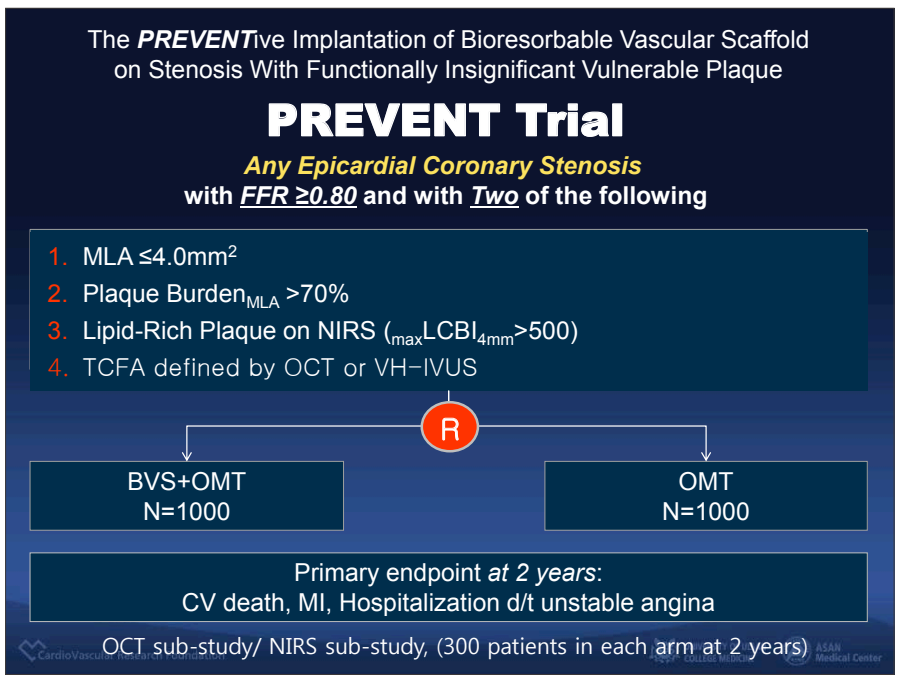


Figure 4. Study flow of the PREVENT study

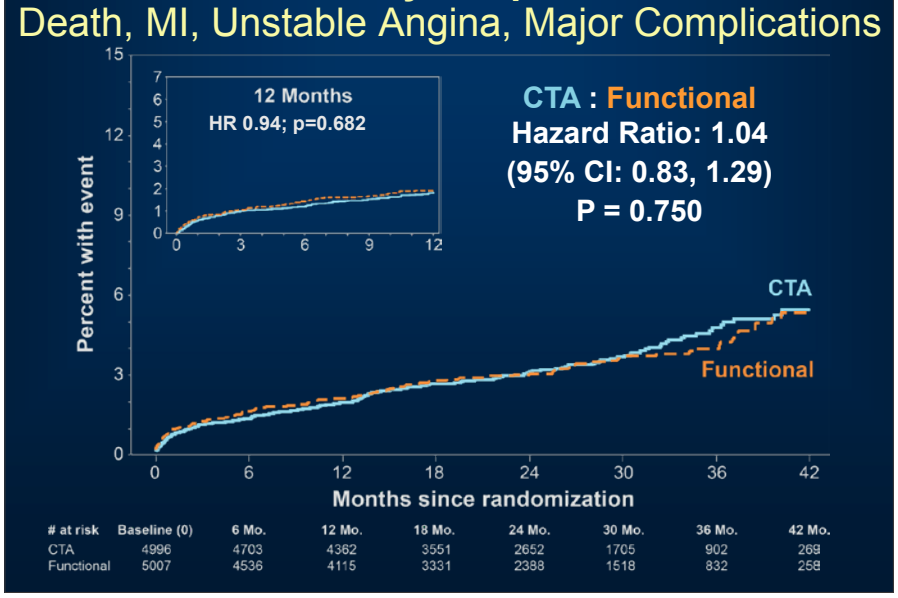


Figure 6. The primary endpoint of the PROMISE study

Physiology

The IRIS-FFR registry is a prospective registry to evaluate FFR-evaluated stenosis. Dr. Seung-Jung Park presented the results of the preliminary analysis. Currently, about 5,000 patients are enrolled. Of those, about 3,000 patients were followed up to at least 6 months. He founded that the event rate at 2 years were similar or higher in stented lesions with FFR of >0.80 than in deferred lesion with FFR of >0.80. In contrast, in lesions with FFR of <0.75, the event rate at 2 years were higher in the deferred lesions than in the stented lesions. Therefore, he concluded that that the diagnostic value of FFR was also prognostic (Figure 5).

Dr. Bon-Kwon Koo spoke about FFR in bifurcation lesions. The bifurcation lesion

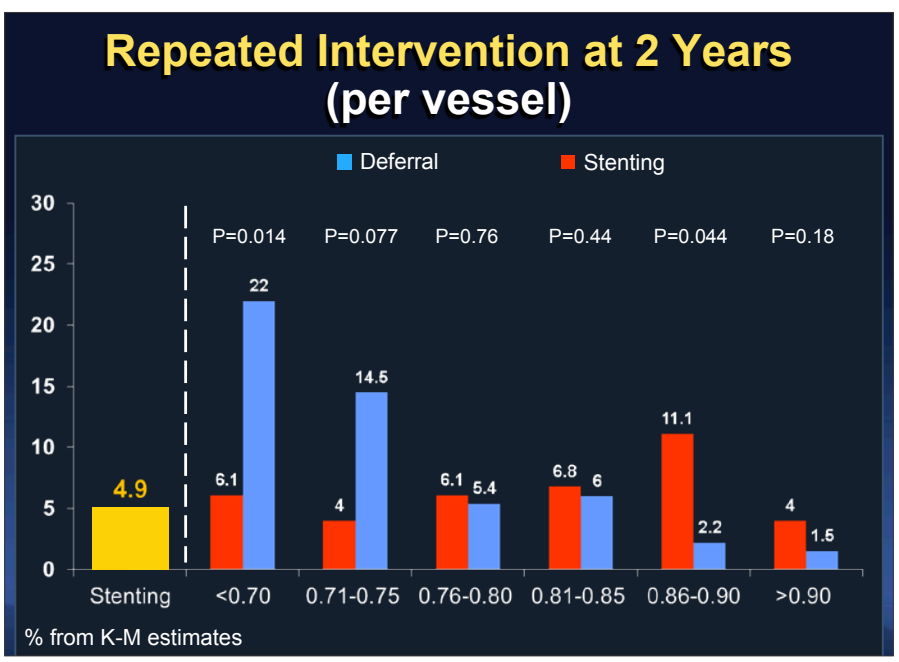


Figure 5. The event rate at 2 years in stented or deferred lesion according to the FFR value

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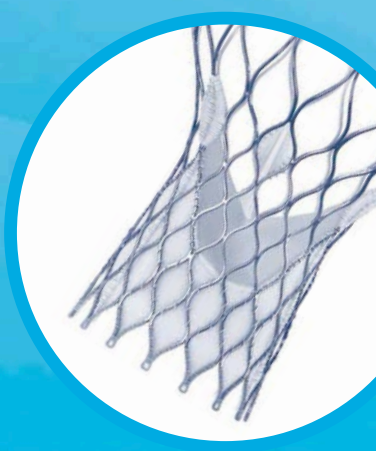

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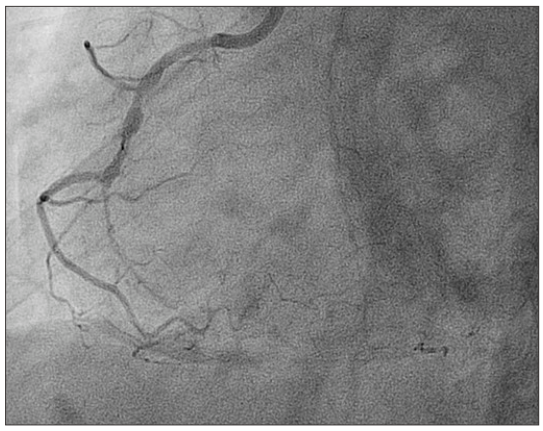
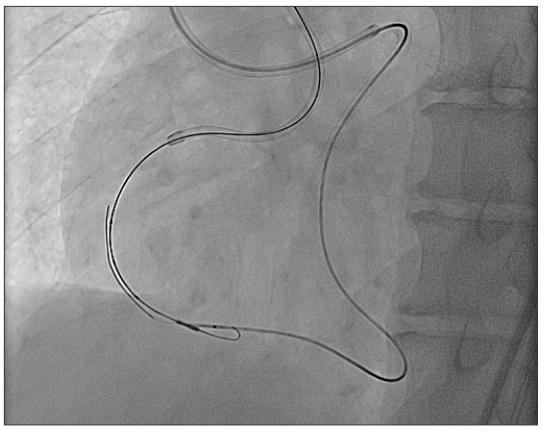
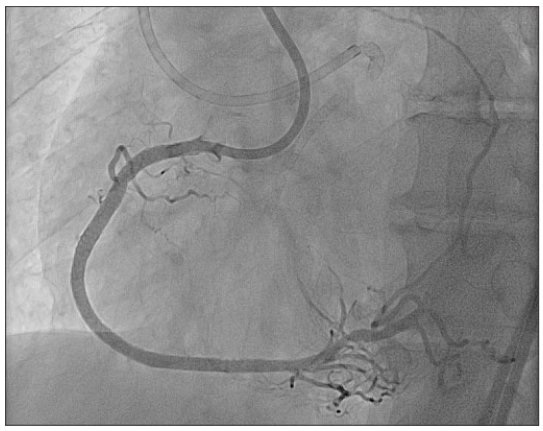
9th CTO LIVE 2015







Reverse CART technique

Microcatheter : ASAHI Corsair

Guidewire : retrograde Conquest Pro

Stent : Xience Xpedition
2.5 x 38 + 3.0 x 38 + 3.5 x 38 mm

*CART: controlled antegrade and retrograde subintimal tracking

Yesterday, 9TH CTO LIVE was successfully held with more than 300 attendees. CTO LIVE is primarily based on live cases and lectures as well as interactive sessions on experts' cases from many of the world's leading experts in CTO PCI. This year, 8 live cases were successfully performed with intensive discussions with operators, panels, and audiences through interactive communication. From 2007, we have performed 74 CTO cases with an average success rate of 96 percent - far exceeding any other CTO conference around the globe.

Back to the Fundamentals: Techniques and Selection of Antegrade Guidewires

Satoru Otsuji, MD
Higashi Takarazuka Satoh Hospital

Several intrinsic characteristics of guidewires can affect the control of movement; torque, penetration force, coating, and tip profile are important factors. When advancing straight-shaped guidewires into the homogeneous tissue, guidewires advance straight via longitudinal force (Figure 1). However, when advancing a tip-shaped guidewire into the homogeneous tissue, the direction was affected by the force from lesion rigidity and then affected by reaction force. Tip deflection occurs (Figure 2). Tip curve length and tip curve angle can affect the degree of tip deflection; also tip diameter and stiffness can have similar effects (Figure 3). It is favorable to use a softer tip guidewire to display controlled deflection because stiffer wires tend to advance linearly into the lesion and the degree of deflection will be small. However, a softer wire has disadvantages when entering the hard tissue. Considering the degree of tip deflection, it is easy to recognize that a small length and proper angled guidewire has advantages in controlling deflection. An important factor from the lesion that influences tip deflection is different compliance of tissue in the occluded segment. Deflection occurs when the wire contacts harder tissue and then the guidewire tends to advance along the boundary of hard tissue (Figure 4); therefore, it is necessary to change the tip direction and enter the lesion via different angle by using deflection control (Figure 5). Another important lesion factor is dissection lumen. Once dissection occurs and expands, it is difficult to make a deflection within the dissection lumen. Making the second curve is one possible way to manage the situation, however the second curve loses controllability and can expand dissection further. Therefore, flexible and tapering tip-shaped wire is recommended as a first line for chronic total occlusions.

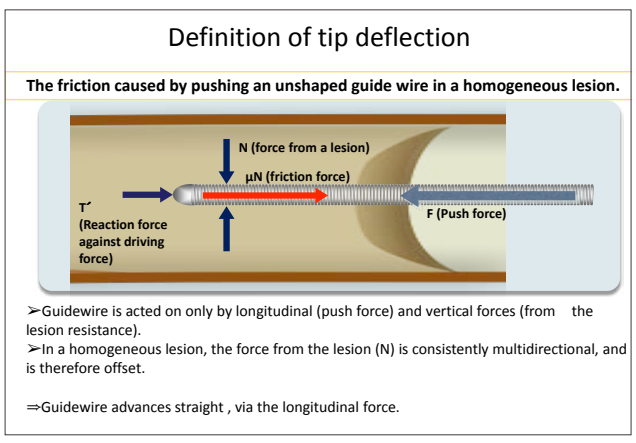
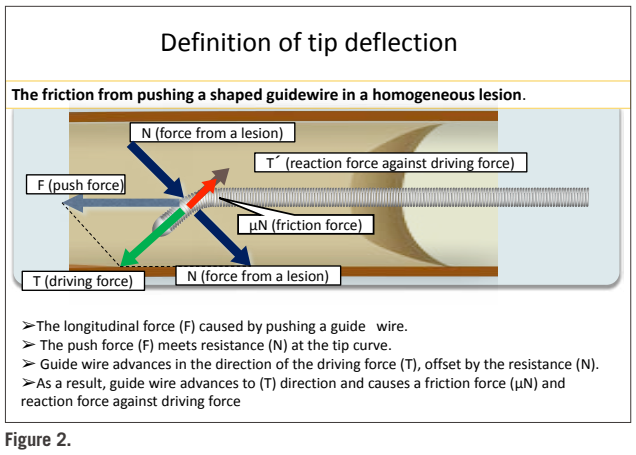


Figure 1.



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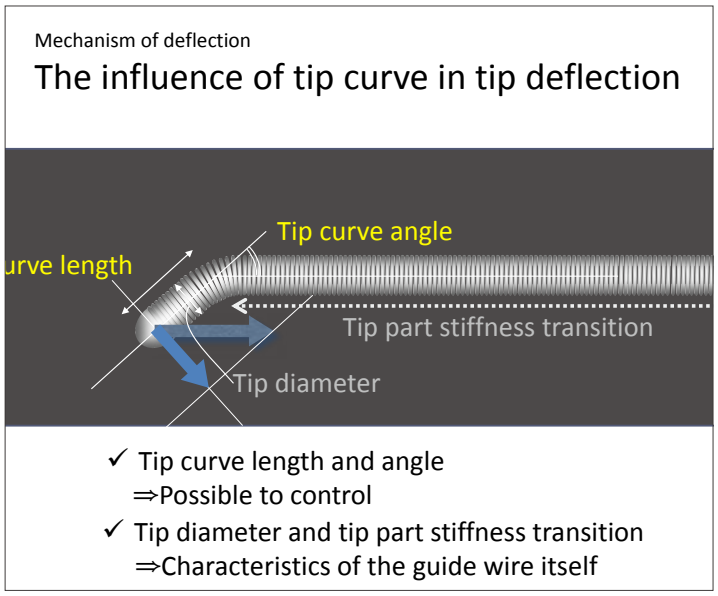

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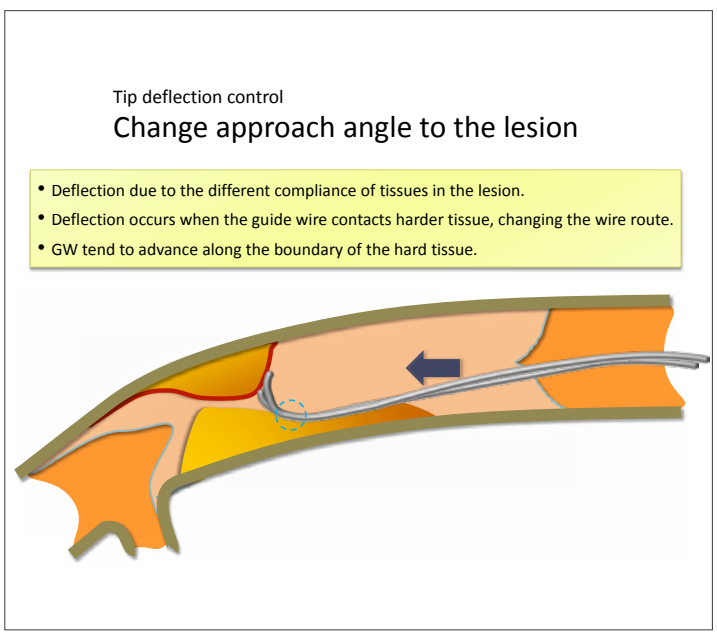


Figure 4.

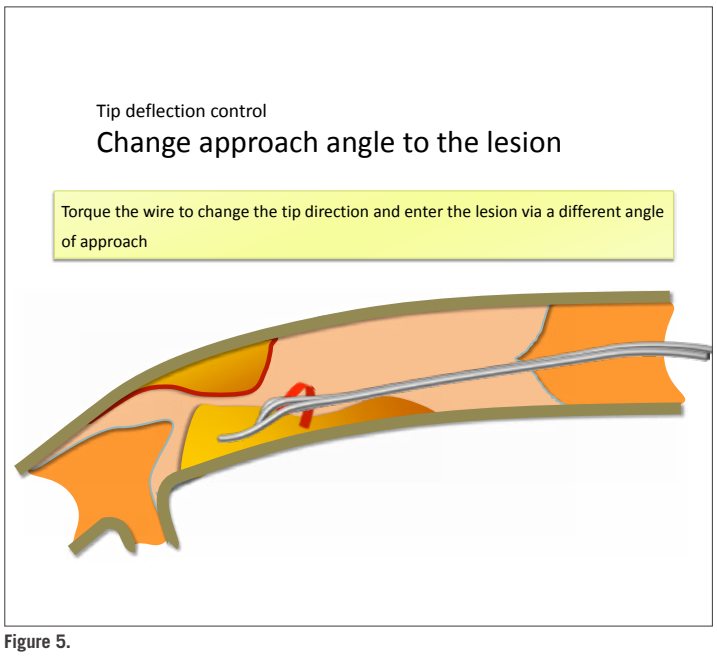


Figure 5.

Rendezvous Technique in Retrograde CTO-PCI: Keys to Success

The bi-directional approach is considered one of the most important strategies for

Kenya Nasu, MD
Toyohashi Heart Center

crossing a guidewire in a long chronic total occlusion (CTO). In a retrograde approach, direct wire crossing, contemporary, and classic reverse CART techniques are the major strategies to recanalize CTO lesions. The rendezvous technique is another option for crossing a guidewire and is defined as a technique in which the guidewire is intentionally advanced into the inner lumen of the microcatheter advanced from the opposite side. This unique technique is useful in certain specific circumstances.

1) Rendezvous Technique at CTO Site

If a very diffuse or calcified lesion is observed at the proximal site of the CTO, the guidewire can be crossed smoothly between rendezvous of both Corsairs in the CTO lesion (Figure 6). If the retrograde Corsair cannot be advanced while using balloon trapping in the antegrade guiding catheter, RG3 can be used directly for externalization. In some cases, the system can be exchanged to the antegrade approach after rendezvous technique at the CTO site. However, this procedure is not typically recommended given the lower back-up force of the system than with externalization.

2) Rendezvous Technique in Guiding Catheter

In certain situations a retrograde microcatheter cannot be advanced to the antegrade guiding catheter after the retrograde guidewire has crossed the CTO site. Rendezvous between the retrograde guidewire and an antegrade microcatheter is useful to exchange to the antegrade system (Figure 7). The retrograde guidewire can be advanced into an antegrade Corsair at the top of the aortic arch in the antegrade guiding catheter. Insertion into the microcatheter can be problematic with a damaged retrograde guidewire tip.

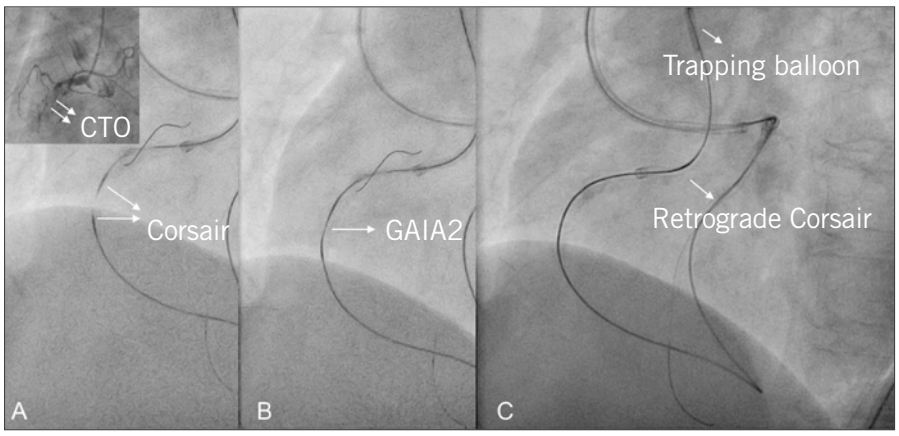


Figure 6. (A)BilateralapproachforRCACTO.Rendez-Vousof both Corsair in the CTO lesion because anything could not be crossed without Corsair. (B) GAIA2 was advanced into antegrade Corsair. (C) Retrograde Corsair is advanced to the guiding using by balloon trapping.

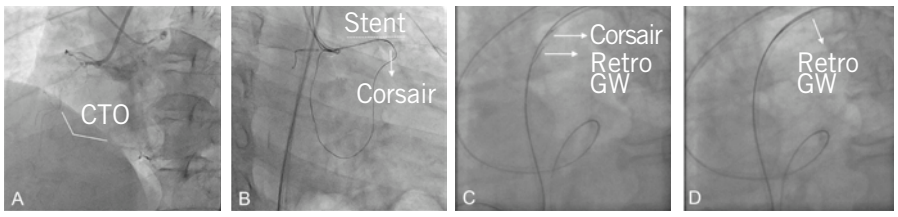


Figure 7. (A) RCA distal CTO.(B) Retrograde Corsair could not pass jailed stent strut. (C) Rendezvous between antegrade Corsair and retrograde GW at top of the aortic arch in antegrade GC. (D) Retrograde GW was advanced into antegrade Corsair.

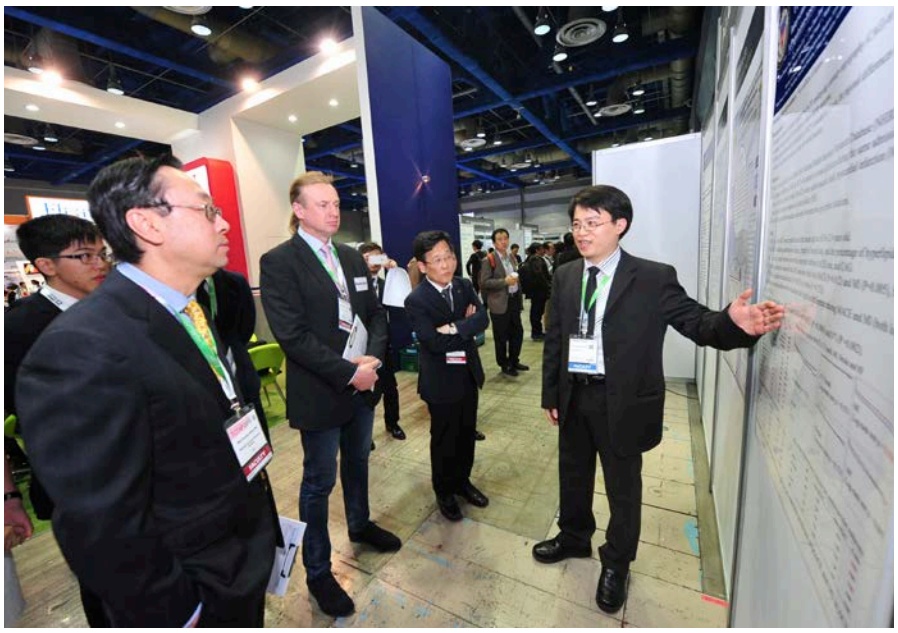
Highlights from Yesterday

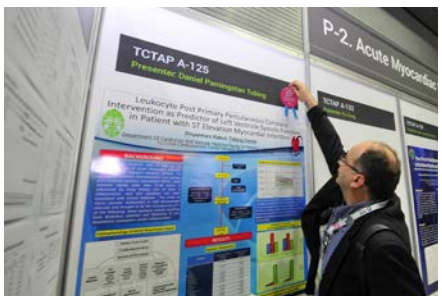
Moderated Poster Abstract Competition Session

A number of interesting abstracts were submitted from all over the world to TCTAP 2015 this year. A few abstracts were selected as poster abstracts to be presented at the Moderated Poster Abstract Competition after being strictly reviewed by the scientific committee. Yesterday, the first day of TCTAP 2015, the Moderated Poster Abstract Competition was held as a half-day program and was specially moderated by distinguished experts in this field. Approximately 50 abstract presenters presented orally and interactive discussions from nine poster sessions took place. A total of 9 best poster abstract presenters from each session were chosen by evaluation. Here are the winners and the best posters are being displayed in the Exhibition Hall, Level 1. Please take the time to view them.

Best Poster Presenter

P-1. **Deuk-Young Nah, MD** (Korea, Republic of)
P-2. **Daniel Parningotan Tobing, MD** (Indonesia)
P-3. **Hao Lu, MD** (China)
P-4. **Seung-Woon Rha, MD** (Korea, Republic of)
P-5. **Se Hun Kang, MD** (Korea, Republic of)
P-6. **Hitoshi Anzai, MD** (Japan)
P-7. **AKM Monwarul Islam, MD** (Bangladesh)
P-8. **Kentaro Jujo, MD** (Japan)
P-9. **Yosuke Katayama, MD** (Japan)





Moderated Abstract & Case Competition
is held from 2:00 PM to 6:00 PM today
in Exhibition hall, Level 1.

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July 20(Mon) - November 20 (Fri), 2015
*Only online submission is available via submission website,
for more information kindly contact abstract@summitmd.com.

All accepted abstracts and cases of TCTAP 2015 are published in the online JACC supplement.
Visit JACC online at http://content.onlinejacc.org or
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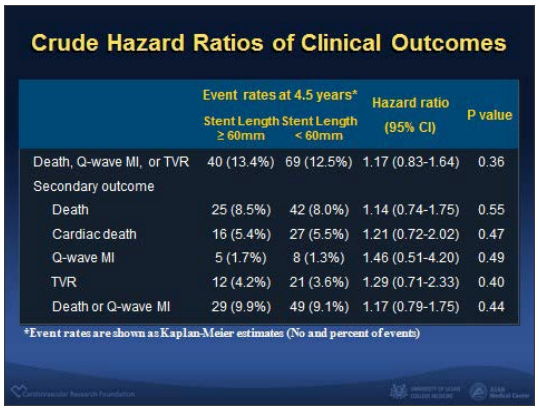
Full Metal Jacket in CTO-PCI from AMC Registry: Safe or Not? Insights from the Asan Medical Center CTO Registry

Seung-Whan Lee, MD
Asan Medical Center

Since the adoption of drug-eluting stents (DES), the full metal jacket (FMJ) stenting has often been used to treat long coronary artery disease (CAD). Previous studies have shown acceptable short- and long-term outcomes from the FMJ procedure. However, there is controversy on the efficacy and safety of this approach. Recently, development of dedicated devices and operator experience for chronic total occlusion (CTO) percutaneous coronary intervention (PCI) has improved the success rate. CTO usually had a diffuse long segment disease, which commonly required FMJ in daily practice, but its clinical outcome data are limited. In the present study, we compared clinical outcomes of the FMJ procedure (stent length ≥60 mm) with those of shorter stent (SS) procedure (stent length <60 mm) with CTO. We compared clinical outcomes (death, MI, TVR) of the FMJ procedure (stent length ≥60 mm, 384 patients) with those of shorter stent (SS) procedure (stent length <60 mm, 700 patients) with CTO. Mean stent length was 76.6±14.5 mm in FMJ group and 36.1±12.2 mm in SS group (p<0.001). FMJ group showed higher incidence of diabetes mellitus, previous intervention, right coronary artery stenting, multivessel disease, and higher use of contrast than the SS group. During a median follow-up of 4.4 years (interquartile range 2.1-7.1), events rate of composite outcomes were statistically not different between the FMJ and SS groups (13.4% vs. 12.5%, log-rank p=0.36). After adjustment, multivariate adjusted (hazard ratio [HR], 1.14; 95% confidence interval [CI], 0.67 to 1.94, p=0.63) and propensity score adjusted composite outcomes (HR, 1.18; 95% CI, 0.82 to 1.70; p=0.85) were statistically not different between the two groups. As well as composite endpoint, the relative risk of individual death, MI, and TVR were not different. The Asan Medical registry showed that patients with CTO lesions who successfully underwent FMJ procedure with DES implantation showed acceptable long-term clinical outcomes compared with patients who received shorter stent implantation.



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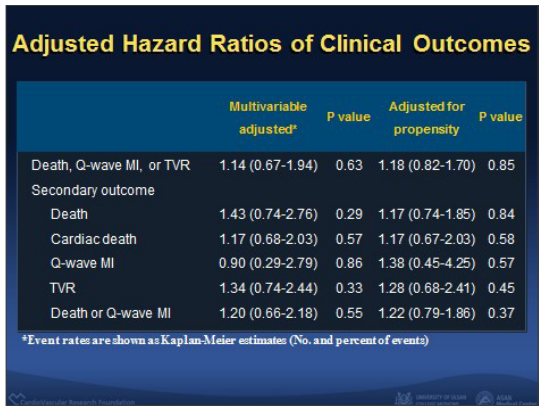


Figure 2.

Tuesday, April 28, 9:00 PM - 5:30 PM, CTO Theater, Level 1

DES & BVS

Current Status of Bioabsorbable Vascular Scaffolds

Currently, drug-eluting stents (DES) are the gold standard for the interventional treatment of significant coronary artery disease (CAD). Although disadvantages and limitations of balloon angioplasty and bare-metal stents were markedly overcome by DES, some concerns regarding a chronic local inflammatory reaction due to permanent implantation of a foreign body, restriction of vascular vasomotion due to a metal cage, and the risk of late and very late stent thrombosis still remains.

The next advancement in the interventional cardiology field may be the introduction of bioabsorbable vascular scaffolds (BVS). The "scaffold' platform refers to the temporary nature of a BRS, distinct from a stent associated with a permanent implant. The idea of dissolvable scaffolds was invented two decades ago, but this concept was nearly forgotten due to the success of metal stents. However, due to potential risks and limitations of current DES system, the BVS platform was reinitiated, resulting in a variety of newer BVS.

Potential Merits and Benefits

Clinically, current BVS achieved successful acute scaffolding of coronary lesions and showed favorable low rates of repeat revascularization and major adverse cardiac events (MACE). Several imaging studies showed beneficial plaque stabilization and sealing. Incomplete endothelialization was observed for DES for several years after implantation. There is also reduced neointimal tissue growth and neoatherosclerosis and chronic inflammation risks as reactions to a permanent metal implant, all well-known late and very late stent thrombosis. After implantation of BVS, no foreign body remained in the vessel long-term. Thus, late and very late stent thrombosis risks are potentially reduced or eliminated, depending on resorption duration. Due to degradation of stent struts, uncovered stent struts are unlikely to factor in stent thrombosis. Incomplete stent apposition, as observed with DES after thrombus resolution, is also unlikely. After DES implantation, paradoxical vasoconstriction was observed, most likely due to impaired endothelial function. Because there is no long-term vessel caging, abnormal shear stress may be reduced as revealed by restored vasomotion. In addition, for patients with complex, multiple lesions who sometimes require multiple intervention, BVS implantation might allow cardiac surgeons to carry out anastomosis of coronary artery bypass grafts at distal segments.

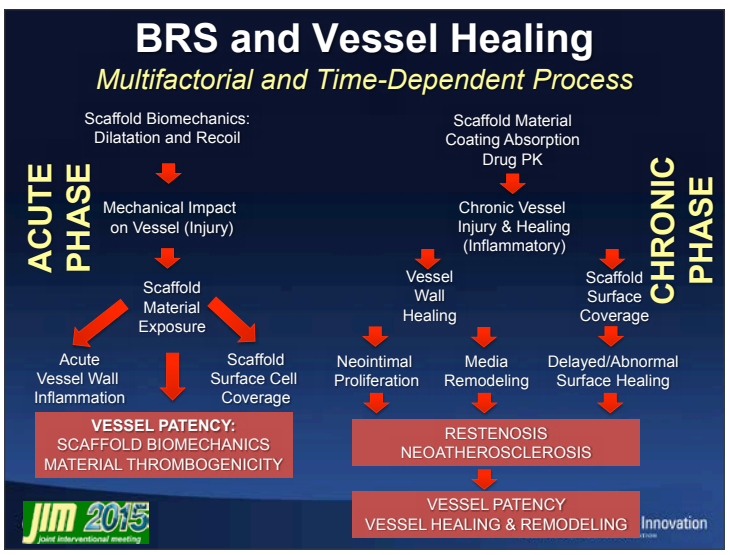


Figure 1.

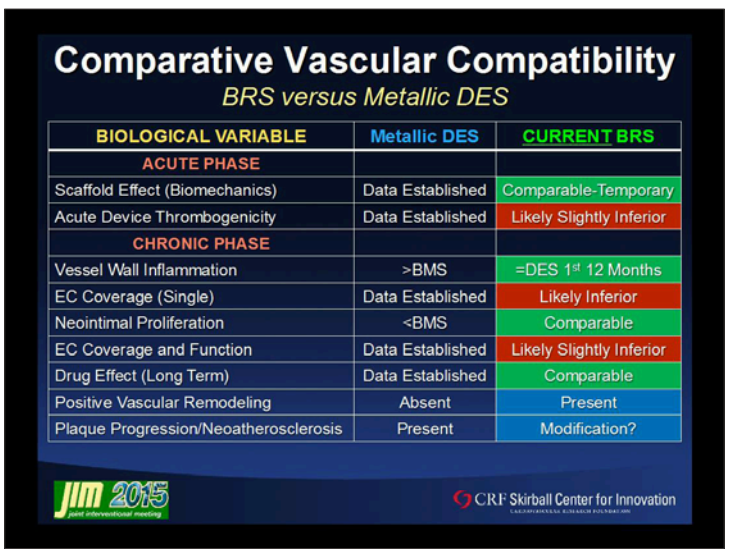


Figure 2.

Clinical Studies

The first-generation BVS was investigated in the ABSORB Cohort A, a first-in-human trial. This prospective, open-label study included 30 patients with a single de novo coronary artery lesion. Device success was achieved in 94% of patients. During 5 years of follow-up, the MACE rate was 3.4%, owing to 1 non-Q-wave MI. Restoration of vasomotion was demonstrated by OCT and a decrease in stent minimal lumen diameter during 2 years of follow-up was also noted. The ABSORB Cohort B study evaluated the second-generation BVS. During 2 years of follow-up, the overall MACE rate was 9.0%. Late lumen loss in quantitative coronary angiography was substantially lower than in Cohort A. IVUS demonstrated a significant minimal lumen area decrease at the 6-month follow-up, which remained almost unchanged at the 2-year follow-up. There was no evidence of late or very late scaffold recoil. Vasomotion was tested by application of either acetylcholine or methylergonovine and subsequent lumen measurements, which revealed restoration of pharmacologically induced vasomotion 12 months. The ABSORB EXTEND is another international multicenter study, including patients with long lesions and small vessels. With 24 months of clinical follow-up of 250 patients, the rate of a MACE was 7.3%, ischemia-driven TLR rate was 4.0%, and stent thrombosis rate was 0.8%. The other CE-approved, commercially available BVS is the DESolve scaffold (Elixir Medical Corporation). Its advantage compared with other BRS is a wider range of expansion with consequently reduced strut fracture risk and self-correction of minor malapposition. During the 12-month follow-up period of the multicenter DESolve first-in-human trial, 1 TLR occurred between 30 days and 6 months; there were 2 other MACE events but no evidence of scaffold thrombosis. The DESolve Nx study was to investigate a DESolve scaffold refinement, including elution of antiproliferative novolimus and a larger device size spectrum. The MACE rate at 1-year follow-up was 5.7% for 126 enrolled patients. Additionally, the lumen area, assessed by OCT, IVUS, and computed tomography, was almost constant during follow-up.

Recent interim results of ABSORB II clinical trials showed comparable clinical outcomes compared to Xience stent.

Current Limitations

Current data are mostly derived from small, nonrandomized observation studies and small-sized clinical trials investigating patients with stable coronary artery disease and simple coronary lesions. Therefore, data regarding clinical experience for other complex anatomic settings (e.g., bifurca-

ABSORB II - Clinical Outcomes

Cumulative incidence in percentage	Absorb 335 pts	Xience 166 pts	*p* value
Composite of cardiac death, target vessel MI and clinically indicated target lesion revascularization (TLF, DoCE)	**4.8 %**	**3.0 %**	**0.35**
Cardiac death	0 %	0 %	1.00
Target vessel MI	4.2 %	1.2 %	0.07
Clinically indicated TLR	1.2 %	1.8 %	0.69
All TLR	1.2 %	1.8 %	0.69
Composite of all death, all MI and all revascularization (PoCE)	**7.3 %**	**9.1 %**	**0.47**
All death	0 %	0.6 %	0.33
All MI	4.5 %	1.2 %	0.06
All revascularization	3.6 %	7.3 %	0.08

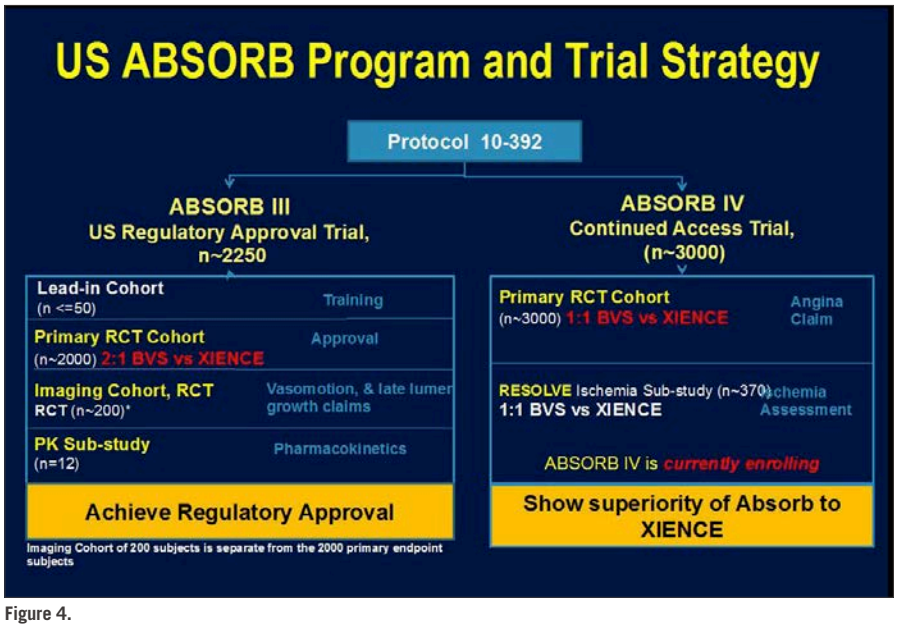
Figure 3.

tion, long, left main lesions, small vessels) or clinical presentations (e.g., acute MI) is limited. Technically, there are practical concerns regarding thicker stent strut thickness which might lead to poor deliverability, vessel injury, platelet deposition, full expansion, and optimal apposition to vessel wall. Thus, mechanical and technical considerations would be more challenging in real clinical practice, especially when the physicians treat calcified or tortuous coronary lesions. In the current system, pre-dilation before BVS placement is mandatory. Therefore, a longer balloon inflation time, post-dilation, and overall procedure time would be necessary. Due to the lack of radial strength of BVS and poor deliverability in complex coronary lesions, prolonged and time-consuming pre-dilation and lesion preparation would be required. There is an increased risk of BVS scaffold fracture with overdilation; thus, significant BVS overdilation would be problematic. Due to these technical limitations of current platform of BVS, it is possible that the total cost and duration of PCI with BVS implantation may be higher than with a conventional DES. In addition, the optimal duration of dual-antiplatelet therapy after BFS implantation is still unknown. Although theoretically resorption is achieved after a relatively short time and a reduction seems prudent, reduced shear stress from the thick struts of BVS might cause platelet activation and complex, multiple process such as release of active drugs and polymer resorption could cause inflammation or unwanted reactions.

Future Perspectives

Considerable progress is being made in advancing BVS for interventional treatment of significant CAD. This technique offers advantages beyond scaffolding a stenosed vessel and may circumvent limitations of current DES. Early results demonstrate technical feasibility and shows positive clinical outcomes. Increasing BRS experience is resulting in a broader spectrum of indications for use. However, some restrictions exist, and further refinements are required. Although numerous bioresorbable stent devices are designed to achieve outcomes superior to current DES system, current available results are still inferior with respect to device success, recoil, MACE, lumen areas, and TLR. More randomized clinical data, such as ABSORB III and IV trial, will be required to determine whether this new technology's theoretical advantages will outweigh its limitations.

Wednesday, April 29, 4:30 PM - 6:00 PM, Room 104, Level 1



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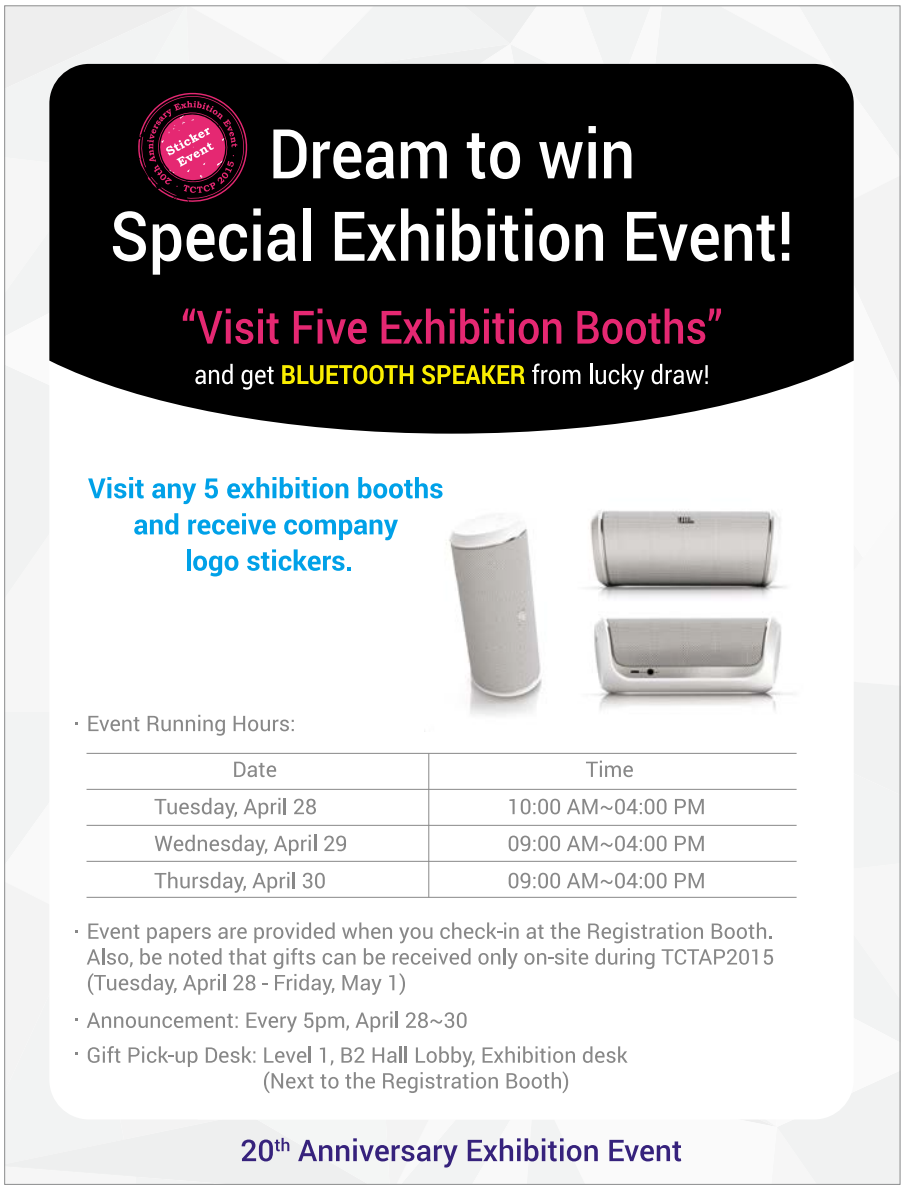


Highlights from Yesterday: TCTAP Fellowship Course

Evolving from Left Main and Bifurcation PCI to Endovascular Intervention

The TCTAP Fellowship Course was a one-day meeting in which advanced trainees in interventional cardiology were exposed to virtually all facets of coronary and endovascular intervention and coronary imaging/physiology. The faculty included acknowledged pioneers and innovators in the field as well as rising stars in interventional cardiology. The Fellowship Course offered in-depth coverage of all the major issues in today's practice of interventional vascular medicine, including the rationale for revascularization procedure in left main (LM) and bifurcation lesion subsets, the performance of basic and complex angioplasty, and comparison of outcomes for various stents such as bare-metal, drug-eluting, and bioabsorbable stents. There was additional emphasis on intracoronary imaging/physiology, non-invasive coronary imaging, and endovascular interventions such as TEVAR/EVAR and stenting for carotid and renal artery. The courses, which were divided into four themes, featured lectures by specialists who also answered questions that enabled attendees to assess their current knowledge.

Left Main & Bifurcation PCI I. Left Man PCI

First, Dr. Young-Hak Kim lectured about the differences between LM and non-LM bifurcations. Dr. Patrick W. Serruys provided valuable lessons on unprotected LM coronary disease. Dr. Seung-Jung Park showed integrated approaches for LM PCI using IVUS and FFR. Dr. Yves R. Louvard presented practical tips and techniques about 2-stent strategy. Dr. Corrado Tamburino presented the importance of risk stratification for left main revascularization. Dr. Imad Sheiben lectured about management of LM restenosis.

Left Main & Bifurcation PCI II. Bifurcaton PCI

Dr. Davide Capodanno presented a lecture on stent thrombosis after BMS, DES, and BRA for bifurcations. Dr. Bon-Kwon Koo showed the use of FFR in bifurcation lesions. Dr. Corrado Tamburino presented his know-how of OCT- or IVUS- guided optimization for BVS. In addition, a debate session on routine kissing for bifurcation lesions was held.

Imaging & Physiology

Dr. Gary S. Mintz presented the role of IVUS in pre- and post-intervention. Dr. Takashi Kubo presented the role of OCT in pre- and post-intervention. Dr. Akiko Maehara introduced the state-of-the-art in high resolution: IVUS. Dr. Soo-Jin Kang lectured about visual-functional mismatch. Dr. Young-Hak Kim presented on CT-based functional imaging.

Endovascular Intervention

Dr. Piotr Odrowaz-Pieniazek presented indications and technical tips for carotid stenting. Dr. Richard R. Heuser showed updated data and technical tips for renal artery stenting. Dr. Kishore Sieunarine provided important lessons for TEVAR/EVAR including planning, stenting, and follow-up. The course was a unique opportunity for attendees to listen to lectures, review established knowledge as well as discuss techniques and guidelines.

Tuesday, April 28, 9:00 AM - 5:20 PM, Coronary Theater, Level 1

Quantum Leap and Beyond..

Bioresorbable Scaffolds in Complex Coronary Lesions

Corrado Tamburino, MD
Ferrarotto Hospital University of Catania

The initial clinical studies have obviously restricted the use of bioresorbable scaffolds (BRS) to simple Type-A lesions. With increasing experience in handling the device, these limits can be pushed toward cases with a more challenging anatomy in order to provide the optimal treatment strategy for these patients. The use of BRS might prove to be useful, especially in multivessel disease or in long diseased lesions to avoid full metal jackets. BRS might also allow possible future treatments, such as CABG, and where the benefit of a restored endothelium might be most beneficial. Hence, concerns exist over deliverability and trackability of these devices. In the real world, bioresorbable scaffolds have already been used for PCI of the left main stem, small diameter (≤2.5 mm) vessels, calcific lesions, long lesion with overlapping stents, in-stent restenosis, bifurcations, and chronic total occlusions. However, further work is needed to improve deliverability, pushability, and crossing profile without compromising radial strength.

Theoretical Construct: Why BRS May Change the Landscape of Coronary Intervention

The clinical introduction of bioresorbable scaffolds (BRS) was announced as the fourth revolution in interventional cardiology due to a paradigm shift. These devices have the unique ability to provide a temporary scaffold that is necessary to maintain the patency of the vessel after intervention

Patrick W. Serruys, MD
Imperial College London

before they gradually dissolve, liberating the vessel from its cage and permitting the restoration of vascular physiology and integrity. Another potential advantage of BRS is to allow, surgical revascularization after absorption of the treated segment, whereas traditional stents often preclude this option. Thus, it is expected that BRS will potentially overcome the limitations of traditional stents such as the risk of late stent thrombosis, neoatherosclerosis, and the local inflammation caused by the presence of a foreign body. Over the last 10 years, considerable efforts have been made to develop new, fully bioresorbable devices. BRS technology has gradually matured and there are numerous devices available currently that are undergoing preclinical or clinical testing. In Dr. Serruys' opinion, this forward leap in technology is probably greater than the remaining challenge of fine-tuning the design of these scaffolds to match the initial performance and handling characteristics of conventional metallic stents.

Autopsy Studies of TAVR - What Have We Learned?

Renu Virmani, MD
CVPath Institute, Inc.

Clinical trials (PARTNER trials and CoreValve US Pivotal trial) have consistently shown the safety and efficacy of Edwards SAPIEN and Medtronic CoreValve transcatheter aortic valve replacement (TAVR) in high risk patients with severe aortic stenosis. However, the pathological responses of those valves after implantation have not been fully described. From our TAVR registry, 109 cases were examined where valves were removed at autopsy or surgery (Edwards SAPIEN 45 cases, Medtronic CoreValve 64 cases). Incorpora-

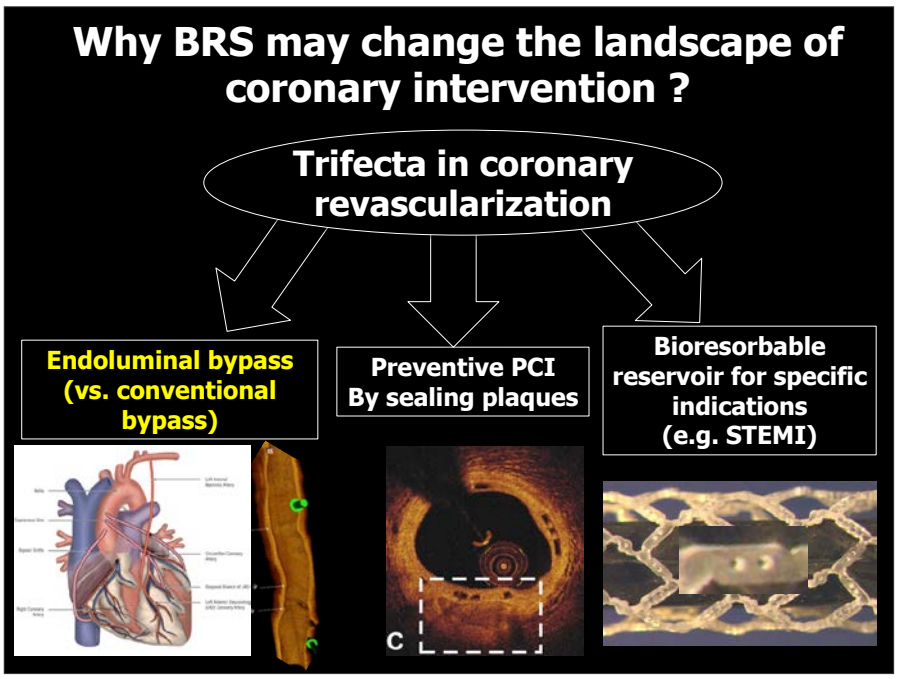


Figure 1.

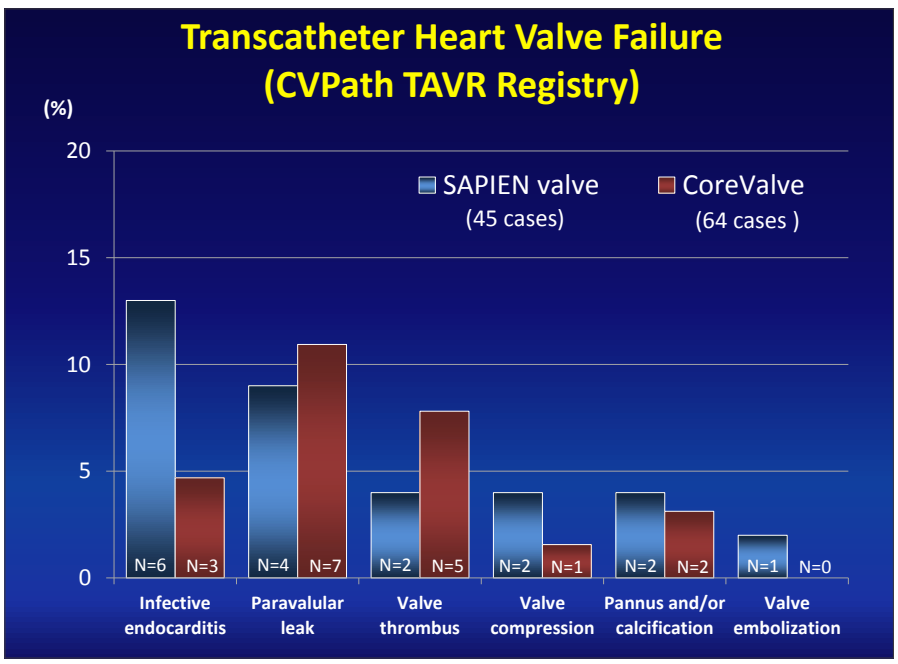


Figure 2.

tion of the frame by neointima and chronic inflammation associated with granulation tissue increased significantly over time. Neointima and structural changes of leaflets also increased significantly over time. Leaflet neointima, degeneration, thrombus, and inflammation were minimal at all time points. Calcification of leaflets was observed at more than 4 years, a complication also seen in surgical aortic bioprosthetic valves of similar duration. Of 109 cases, there were infective endocarditis (6 SAPIEN, 3 CoreValve), valve thrombosis (2 SAPIEN, 5 CoreValve), and paravalvular gaps (4 SAPIEN, 7 CoreValve). All explanted valves demonstrated intact leaflets with mild inflammation, thrombus, and neointima up to 5 years. Overall, valve leaflet durability for TAVR appears to be comparable to surgical bioprosthetic valves.

TAVR Future Directions: New Technology and New Clinical Indications

E Murat Tuzcu, MD
Cleveland Clinic

After several years of trials and increased clinical use, transcatheter aortic valve replacement (TAVR) has reached a tipping point for becoming the standard of care. TAVR is approved in the U.S. for treatment of aortic stenosis in patients who are ineligible for surgery or at high surgical risk; indications for TAVR will likely be extended to a broader spectrum of patients, in particular those with surgical bioprosthetic failure or at intermediate risk for surgery. In Europe and Israel, investigators examined procedural success and outcomes with the self-expanding CoreValve device in 43 patients (mean age, 75) with severe, native aortic regurgitation (AR) without aortic stenosis. Devices were successfully implanted in 98% of patients. At 30 days, all-cause mortality was 9% and 2 patients had major stroke (5%). Valve-in-valve procedure may provide an alternative to replacement of a degenerated surgically-implanted valve in patients who are not surgical candidates. In the Global Valve-in-Valve Registry of 202 patients (mean age, 78) with degenerated bioprosthetic valves, procedural success with transcatheter valve-in-valve replacement (utilizing CoreValve in 124 patients and Edwards SAPIEN in 78 patients) was achieved in 93 percent of cases. At 30-day follow-up, all-cause mortality was 8 percent, and 84 percent of patients were at New York Heart Association functional class I/II. Furthermore, there is cautious optimism that TAVR might also be beneficial in intermediate-risk patients. Ideally, future TAVR devices will be delivered through smaller vascular sheaths, enable the operator to optimally position the valve before deployment, and further decrease paravalvular regurgitation.

Wednesday, April 29, 2:00 PM - 6:00 PM, Coronary Theater, Level 1

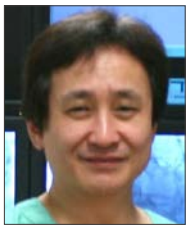
Current Trend in Limb Salvage: Endovascular Symposium

In Featured Lectures, we can meet experts and learn their tips and tricks for complex aorta-iliac and femoral arteries. Those are very challenging for all interventionists. Let us see!

Long chronic total occlusion (CTO) of superficial femoral arteries (SFA) is one of the most difficult lesions to treat by means of endovascular procedure. Knuckle wire technique is relatively easy and also useful to reduce procedure time. However, antegrade knuckle wire tends to go into the sub-intimal space at the distal end of the CTO, resulting in a re-entry problem. In order to overcome such situations, several different re-entry devices have been introduced.

There is an alternative technique to recanalize the long SFA-CTO with higher initial success rate than the combined use of knuckle wire technique and re-entry device. This is the "bi-directional wiring approach." So far, several different techniques have been developed to introduce the retrograde guidewire to the distal true lumen of the long SFA-CTO: (1) Trans-collateral wiring was first introduced in 2007, in which a guidewire was advanced to the distal true lumen via a collateral channel from the deep femoral artery (2) Frontal SFA puncture was introduced in 2009, in which the distal true lumen of SFA was directly punctured by using 18-20G needle, and a retrograde guidewire was introduced through the needle (3) Side SFA / popliteal artery (POP) puncture was introduced in 2011, in which the distal SFA or popliteal artery (P1 and P2 segment) was punctured by using a 20G needle without changing the patient's position on the table.

Novel Wiring Tips for SFA-CTO



Recently, Dr. Kazushi Urasawa (Tokeidai Memorial Hospital, Sapporo, Japan) developed a novel wiring technique and named it "frontal POP puncture." By using this technique, the operator can introduce a retrograde guidewire into the distal POP (P2 and P3 segment) without changing the patient's position. Distal POP could be observed between the tibia and fibula on

Continued on next page

Figure 1. Frontal Popliteal Puncture

the ipsi-lateral oblique view. It was possible to reach the distal POP by puncturing one inch below the tibiofibular junction under angiographic guidance. After successful puncture, a 0.014" guidewire was introduced through the metal needle into the distal POP retrogradely; the metal needle was removed and then a 0.014" compatible microcatheter was introduced over the guidewire.

Now, there are several suitable puncture techniques from a variety of methods depending on the anatomy of the patient's SFA-CTO. It is beneficial to learn these puncture techniques to establish the bi-directional wiring condition and improve the success rate of endovascular therapy (EVT) in cases with long SFA-CTO.

Best Interventional Therapies for TASC C/D Lesions in the Femoral-Popliteal Arteries

In addition, Dr. Robert M. Bersin (Swedish Medical Center, Seattle, Washington, USA) and Mark W. Burket (University of Toledo Medical Center, Toledo, Ohio, USA) will give their perspectives on complex lesion subset. Which option is the best interventional therapy for TASC C/D lesions in femoral-popliteal arteries? What is your opinion? According to the TASC II guideline, we can define TASC C as >15 cm lesion or restenosis and TASC D as ≧ 20 cm CTO. Traditionally, the primary patency of autologous vein grafts is only 50-60% at 1-year when studied rigorously in controlled clinical trials. Intervention is preferred today for lesions >15cm given the improved outcomes with next generation drug-eluting stents, drug-coated balloon, and endografts. Based on several randomized trials, the primary patency of TASC C/D lesions is about 50-90%, according to individual treatment options such as drug-coated balloon (DCB), bare-metal stent (BMS), drug-eluting stent (DES), and covered stent. Also, the results of intervention appear to be equivalent to surgery for TASC II type D lesions, even when autologous vein is used.

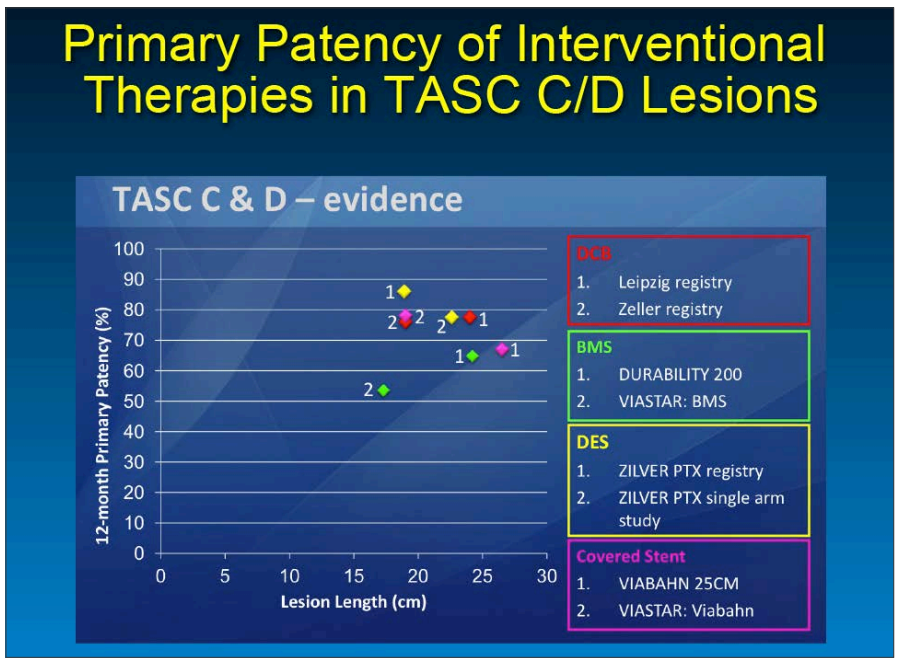


Figure 2. Primary Patency of Interventional Therapies in TASC C/D Lesions

Percutaneous Reconstruction of Complex Aorto-Iliac Disease: Tips from Imaging to Intervention

For complex aortoiliac disease, percutaneous reconstruction can be considered as first-line strategy. Intervention must be done by carefully-devised plan, appropriate equipment, and step-by-step approaches and the results are also very durable.

PTA patients experiencing acute failure (e.g., ≥30% residual stenosis) underwent secondary randomization to provisional stenting with Zilver BMS or Zilver PTX. Follow-up included event-free survival and primary patency by duplex ultrasound core laboratory analysis. As previously reported, 479 patients were enrolled from the United States, Japan, and Germany; 5-year follow-up is complete. The 5-year freedom from TLR (target lesion revascularization) rate is significantly higher for the Zilver PTX group compared to the standard care group, which includes optimal PTA and provisional BMS (83.1% vs. 67.6%, $p<0.01$). This represents a 48% reduction in reinterventions through 5 years. Regarding effectiveness, the 5-year patency rate for the Zilver PTX group is superior to the standard care group (66.4% vs. 43.4%, $p<0.01$), which represents a 41% reduction in restenosis through 5 years. Clinical benefit through 5 years, defined as freedom from persistent or worsening claudication, rest pain, ulcer, or tissue loss, was also superior for the Zilver PTX group compared to the standard care group (79.8% vs. 59.3%, $p<0.01$). Additionally, provisional stenting with Zilver PTX versus Zilver BMS continues to demonstrate significant benefits of paclitaxel coating through 5 years, with patency rates of 72.4% and 53.0%, respectively ($p=0.03$); this represents a 41% reduction in restenosis through 5 years due to the drug. These data represents the largest randomized controlled trial with 5-year follow-up and provide important new insights for endovascular treatment of the SFA.

5-Year Results of Zilver PTX Randomized Trial: DES is Default

Five years has passed since the launch of the drug-eluting stent for SFA. Dr. Hiroyoshi Yokoi (Fukuoka Sanno Hospital, Fukuoka, Japan) will present 5-year results of the Zilver PTX randomized trial, so drug-eluting stent could be default strategy for all SFA stenosis. Patients with de novo or restenotic SFA lesions were randomized to Zilver PTX stent placement or PTA.

2D vs. 3D Angiosome for BTK

Finally, the last stage of the Endovascular Session will be dedicated to below-the-knee (BTK). Firstly, Dr. Osami Kawarada (National Cerebral and Cardiovascular Center, Osaka, Japan) will cover the issue about 2D vs. 3D angiosome concept for BTK intervention. Intervention is frequently

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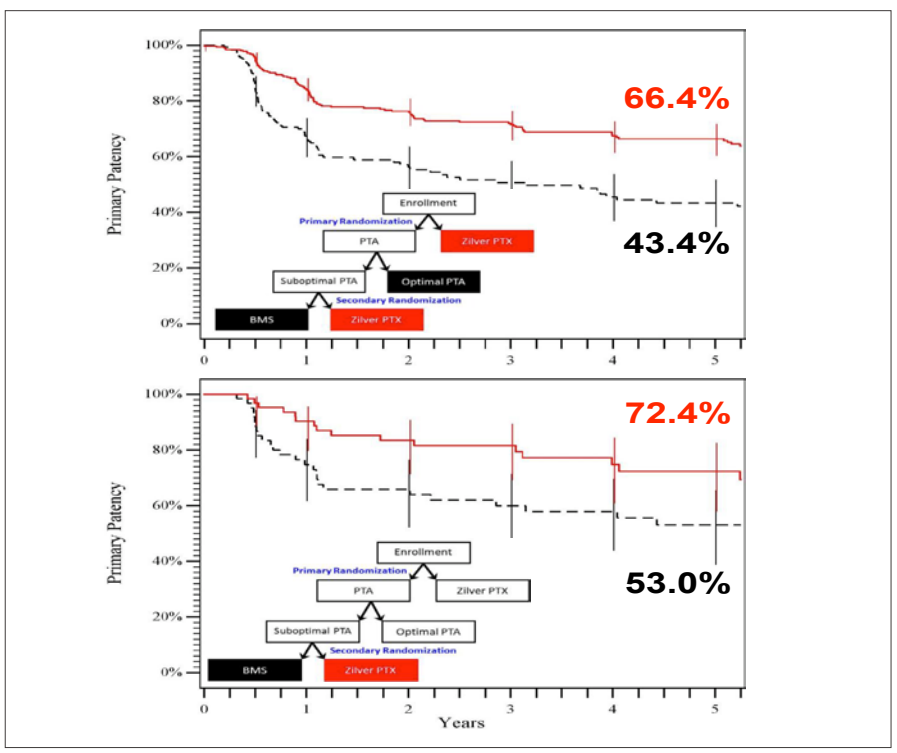


Figure 3. 5-Year Results of Zilver PTX Randomized Trial: DES is Default

faced with questions about which arteries must be opened by intervention and how many arteries must be opened for wound healing. During that time, angiosome concept can be easily applied. The original concept of angiosome is a "3-dimensional volume" supplied by a source artery that cannot be assessed after the occlusion of the adjacent source artery. In practice, a biased diagnosis of direct and indirect intervention was caused confusing 2D angiosome maps, especially in the toe area. Is the 2D angiosome theory myth or fact? Recently, Dr. Osami Kawarada published data about a single tibial artery revascularization, whether ATA or PTA, yielding comparable improvements in microcirculation of the dorsal and plantar foot based on skin perfusion pressure (SPP). According to his data, approximately half of the feet revascularization had a change in microcirculation that was not consistent with the 2D angiosome theory. So, a simple strategy for below-the-knee, in case of <40 mmHg of SPP, establishment of at least one straight-line flow based on angiographic findings are enough after achieving more than 40 mmHg of SPP. For persistent <40 mmHg of SPP, more tibial, peroneal, or pedal revascularization is necessary for wound healing. In conclusion, 2D-angiosome-oriented strategy could be of less importance. The bottom line is "establishment of at least one straight-line flow" on the basis of angiographic findings.

DEBATE-BTK and IN.PACT DEEP Trial: How to Apply DCB in BTK

Secondly, Dr. Gian Battista Danzi (Santa Corona Hospital, Pietra Ligure, Italy) will review the role of DCB in BTK intervention based on DEBATE-BTK and IN-.PACT DEEP trial. The two prospective randomized studies have evaluated the efficacy of the drug-coated balloons on diabetic patients with CLI with controversial results. Liistro *et al.* performed a single-center randomized study (DEBATE-BTK) of DCB versus PTA in 132 diabetic patients with CLI, and demonstrated a significant reduction in 12-month angiographic restenosis and need for re-intervention. Zeller *et al.* conducted a multicenter randomized trial (IN.PACT DEEP) of drug-coated balloon versus PTA in 358 patients. The trial failed to meet its primary efficacy endpoint of DCB superiority (in terms of clinically driven TLR and angiographic late lumen loss) compared to PTA. The authors concluded that patients with CLI DCB had comparable efficacy compared to PTA, and while primary safety was met, there was a trend towards increased major amputation rate through 12 months compared to PTA.

How can we interpret these disparate results? One possible explanation for the different findings between the IN.PACT DEEP trial and previous positive reports concerning the use of DCB in other vascular territories could reside on the difference of the balloon platform and coating process. It is more difficult to try to explain the diverging results observed between the DEBATE-BTK and the Zeller's trial, especially considering that both studies were conducted in a similar clinical scenario. The DEBATE-BTK probably suffers from the fact that usually single-center trials show larger treatment effects compared to multicenter trials. The IN.PACT DEEP, conducted in a very rigorous manner, probably did not properly take into account the importance and impact of a team approach, intense wound care surveillance, and decision making regarding the indication for amputation. The difficult interpretation of these conflicting results makes it premature to conclude that DCBs are not effective in below-the-knee interventions. In our current clinical practice, we reserve the use of DCBs to high-risk subgroups of patients in whom a more durable vessel patency is desirable, such as those with an occlusive restenosis after conventional balloon PTA and those in whom the future of the foot resides on a single flow line of blood flow to the foot. However, additional trials are needed to define the real impact of DCBs on intimal hyperplasia, target lesion revascularization, and clinical outcome of patients with CLI.

Wednesday, April 29, 10:00 AM - 6:00 PM, Endovascular & Structural Heart Theater, Level 1

TCTAP Wrap up Interview

TCTAP 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 detail with world's leading experts in the field of vascular medicine. It will be broadcast live throughout the venue.

Wednesday, April 29 · Level 2

BVS (Bioresorbable Vascular Scaffold) for Coronary Artery Disease
8:40 AM - 9:10 AM
Moderator: Patrick W. Serruys
Interviewees: Bernard Chevalier, Corrado Tamburino, Renu Virmani

Dual Antiplatelet Therapy for Coronary Artery Disease
10:00 AM - 10:30 AM
Moderator: Gregg W. Stone
Interviewees: David J. Cohen, Manesh Patel, Freek W. A. Verheugt

Transcatheter Aortic Valve Replacement
11:30 AM - 12:00 PM
Moderator: Alain G. Cribier
Interviewees: Eberhard Grube, Susheel Kodali, Corrado Tamburino

CABG vs. PCI for LM or 3VD
3:40 PM - 4:10 PM
Moderator: Marie-Claude Morice
Interviewees: Seung-Jung Park, Patrick W. Serruys, David Paul Taggart

How to Detect and Treat Vulnerable Plaques?
4:30 PM - 5:00 PM
Moderator: Ik-Kyung Jang
Interviewees: Takashi Akasaka, Seung-Jung Park, Gregg W. Stone

The finished interviews will be broadcast on our websites at **www.summit-tctap.com, www.summitmd.com, www.youtube.com/CVRF events and TCTAP mobile application** after the meeting.

Heart Keeper 2015 Event

The CardioVascular Research Foundation in association with the Asan Medical Center Heart Hospital has been organizing cardiovascular disease and intervention related national and international academic exchanges. This year marks the 20th anniversary of TCTAP. To celebrate this event, 'Heart Keeper 2015', co-sponsored by the Asan Medical Center Heart Hospital, was developed. The event is open to the general public and aims to not only increase cardiovascular disease awareness, but also share information on treatment and prevention.

The "TALK CONCERT" will be the highlight of the event. The "TALK CONCERT" is a way to share important health-related information in way that is easy to understand. It is divided into two parts: "New Paradigm for Cardiac Treatment" and "New Heart! Managing a Healthy Heart." Directed by medical journalists, many distinguished health care professionals are expected to participate in the event. Also, singers who received a heart transplant will give a performance and share experiences.

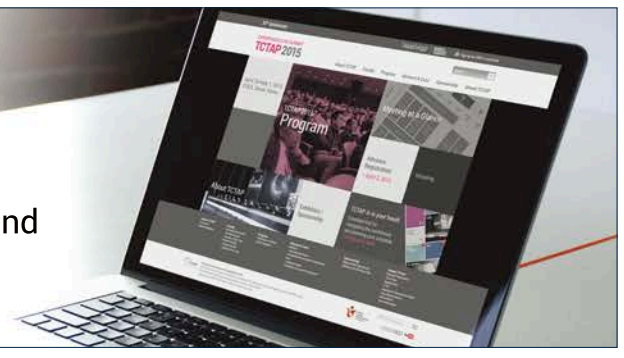
During the lecture portion of 'Heart Keeper 2015', Dr. Si-Hyung Lee will give a talk on how to live healthily for 100 years. His talk will be unique because it will not focus on disease information. Instead, Dr. Lee wants us to ask ourselves what we think well-being is and use that as a basis to focus on positive thinking and changing our life cycle.

Meanwhile, there will be a rest area. Attendees can receive more information here and learn that prevention and management are just as important as treatment. The rest area will be laid out so that attendees can see and experience how important nutrition, dietary management, and not smoking is.

Wednesday, April 29, 1:30 PM – 5:30 PM

www.summit-tctap.com

After meeting, you can enjoy not only all the presentation slides presented, but also video clips of Wrap-up Interview, Live demonstration, photos taken and Daily Newspapers distributed during conference via our official website.



Partnership Session with International Societies

One of the most popular features developed at TCTAP are the Partnership Sessions with International Societies. Yesterday, on April 28, there were interesting academic sessions organized by several Asia Pacific societies including TTT from Taiwan, ISICAM from Indonesia, CIAT from Thailand, HKSTENT from Hong Kong, BIT from Bangladesh, NIC from India, and Malaysia LIVE from Malaysia. A special TCT session from the USA will be held today as well as a QICC session from China. CCT, a longtime friend of TCTAP, will hold a session from Japan tomorrow. Dr. Gary S. Mintz and Dr. Satoru Otsuji, who are great partners and contributors of TCTAP, wrote special messages to celebrate the 20th anniversary of TCTAP.

Transcatheter Cardiovascular Therapeutics (TCT)

The Cardiovascular Summit-TCTAP is 20 years old. Among the many international faculty participating this year, perhaps I have a unique perspective since I have been part of this meeting since 1997, missing only the first meeting - the one held in 1995. I remember when Seung-Jung Park, Martin Leon, and I met at EuroPCR in May 2004 at the top of a hotel in Paris (although I forget the name of the hotel) and we discussed branding what was then the Angioplasty Summit as TCTAP. In addition to being the 20th year anniversary, this is also the 11th TCTAP.

There are many parallels between TCTAP and Transcatheter Cardiovascular Therapeutics (TCT), which will be held this year in San Francisco in October. Like TCT, TCTAP has grown from a small meeting that was held on the sixth floor of Asan Medical Center (operators merely walked three flights of stairs to the third floor of the hospital to do cases) to an important international conference - first with a move to the Sheraton Walkerhill Hotel and now for the third year at the COEX. Abstracts from both meetings are published in the *Journal of the American College of Cardiology*. Both TCT and TCTAP have evolved from a meeting only about coronary angioplasty to a meeting encompassing the global specialty of minimally invasive treatments of all forms of cardiovascular diseases. Both meetings initially began with live case demonstrations from local hospitals and now include live cases from around the world. Similar to how TCT has survived two hurricanes and the 9/11 attacks, TCTAP has seen threats from North Korea (in 2013) and the Sewol Ferry disaster (in 2014). Both meetings have many people working behind the scenes - people who remain faceless and nameless, but are the key to success. Through hard work and international cooperation, TCTAP has grown and thrived like TCT. But now it is time to celebrate. Happy Birthday and congratulations to Seung-Jung Park and his fantastic team!

For the 20th anniversary, I am joined by many of my colleagues from CRF and Columbia University, as well as the live case operators working in New York. We have prepared a TCT@TCTAP session that we hope will be one of the highlights of this year's program. It covers the most important topics in valve intervention, coronary intervention, and adjunct imaging and physiology along with live case transmissions from the catheterization lab of Columbia University Medical Center. Please enjoy.

Gary S. Mintz, MD
Cardiovascular Research Foundation

Wednesday, April 29, 10:15 AM - 12:30 PM, Main Arena, Level 3

Complex Cardiovascular Therapeutics (CCT)

On the 20th anniversary of TCTAP, we would like to deliver a congratulatory address and express our respect for TCTAP in displaying leadership and making great contributions to the advancement of interventional therapeutics in the Asia-Pacific region. We believe Prof. Seung-Jung Park and the co-organizing doctors displayed extraordinary efforts and experienced hardships in order to make this meeting, which started as "Asan Live" in Korea organized by Asan Medical Center, into a representative meeting of the Asia-Pacific region. Regarding the program, we are impressed that it always stands at the forefront of science and is splendidly polished.

As the name indicates, CCT is a meeting which aims to always challenge complex lesions, beginning with CTO, and gain technical innovations. The meeting started with three doctors, Dr. Katoh, Dr. Suzuki and Dr. Tamai, who started to challenge PCI for complex lesions with originality in the middle of 1990s, the same time as the beginning of TCTAP. As a result of lively exchanges of ideas by broadcasting CTO Live from Toyohashi Heart Center to the TCTAP venue, a TAVI Live transmission from Asan Medical Center during CCT became reality last year. Korea and Japan have frequent daily exchanges because they are neighbors, and we are more than happy that both could contribute not only experts, but also knowledge and technical innovation for everyone related to interventional therapeutics.

This year, the CCT @ TCTAP session titled "Improving Success in CTO PCI" will be held from 2:00 PM on April 30, 2015. The session consists of three lectures focused on retrograde approach and IVUS guided technique as well as two live cases from CCT2014. We would be glad if we could help improve your success rate in CTO PCI. We are waiting for your active participation at the session.

Satoru Otsuji, MD
Higashi Takarazuka Satoh Hospital

Thursday, April 30, 2:00 PM - 3:30 PM, Room 104, Level 1

Must Visit Place in Seoul

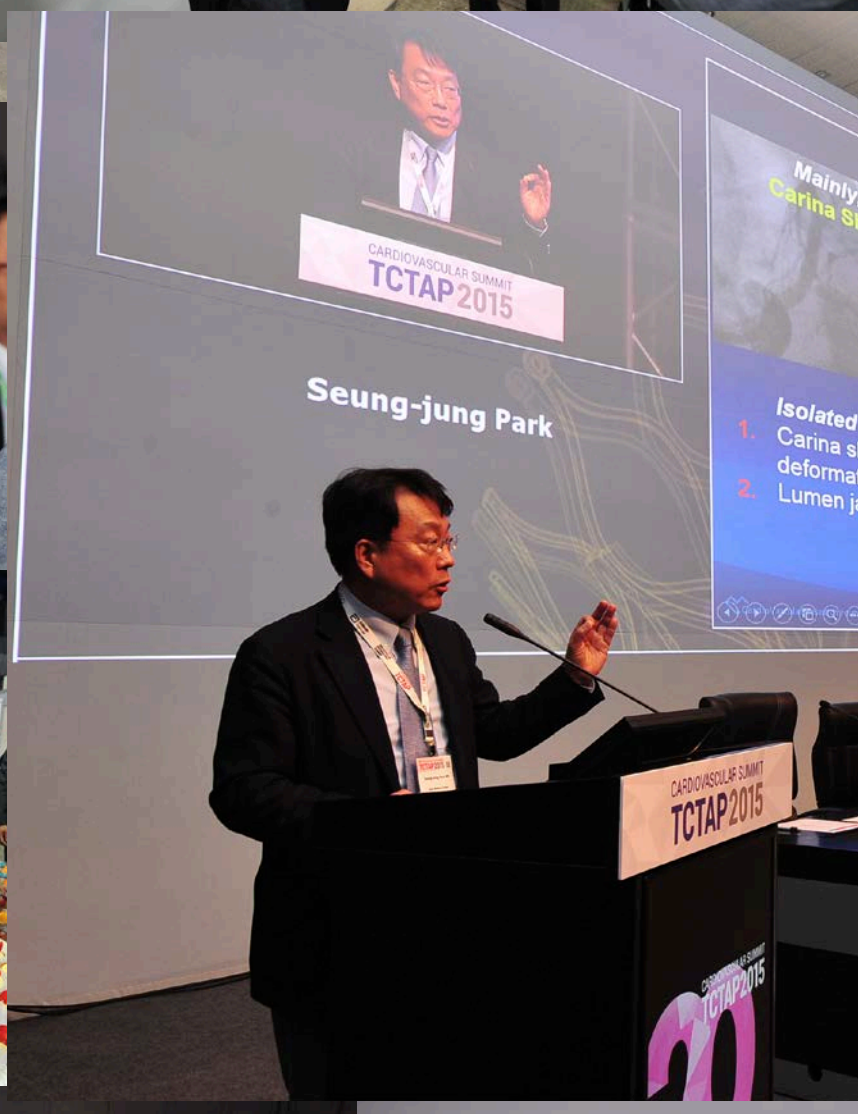
A Romantic Attraction: N Seoul Tower

N Seoul Tower was built in 1969 as Korea's first integrated transmission tower beaming television and radio broadcasts across the capital. Since opening to the public in 1980, it has become a much-loved Seoul landmark. The tower's main attractions include multi-colored digital art projected onto the tower at night, a digital observatory, and a roof terrace. The mountain surroundings of Namsan (Mt.) have made N Seoul Tower a popular place to unwind for both locals and tourists alike.

Please visit Tour Information Desk, Level 1, for more information


Abbott Vascular
Medtronic
Case Zone
Congress Bag
Abstract Zone


TCTAP A-172
Presenter: Mu-Yang Hsieh
P-6. Endovascular Intervention
TCTAP A-174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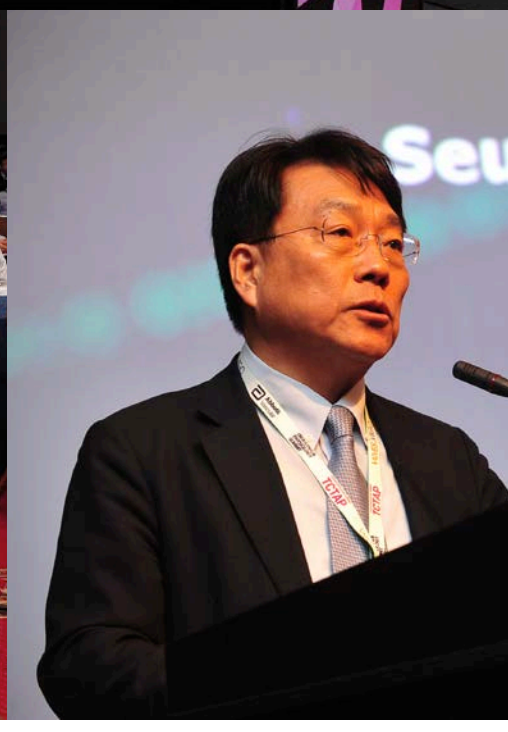
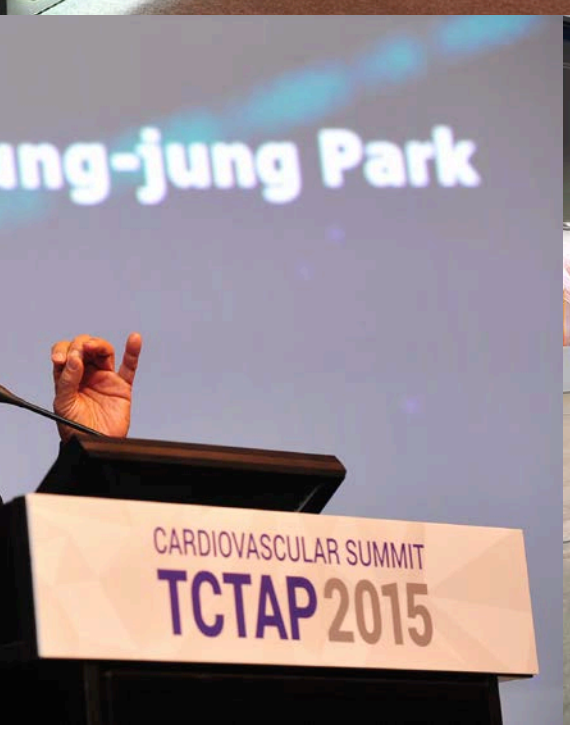
TCTAP 2015
Seung-jung Park


P-9: Imaging & Physiology


TCTAP


CARDIOVASCULAR SUMMIT
TCTAP 2015


Mechanism of LCX Jailing
Before Cross-Over
After Cross-Over
LCX
LAD
Carina Shift Rarely Reduce FFR,
hift was mainly due to compressive vessel
tion, not by plaque gain.
ailing is extremely focal, and discrete.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SyvekExcel™ SyvekNT™

Fast, Easy, Effective Hemostasis for Vascular Catheterization

Proven Hemostatic Action

Proven Results in ACTs up to 300
Allows for almost immediate sheath pull after the procedure
Can reduce time to ambulation for PCI patients to two hours

Ideal for Anticoagulated Patients

Heparin
Angiomax(bivalirudin)
Plavix(clopidogrel)
GPIIbIIIa-receptor antagonists
Aspirin

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