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WHAT ARE THE TECHNIQUES THAT CAN BE USED TO WIRE DIFFICULT SIDE BRANCHES?

Dr Praveen Chandra, Gurugram

Successful wiring of a side branch or bifurcation is a significant step in some complex percutaneous coronary interventions (PCIs). Some anatomical subsets can be particularly challenging. Branch vessels arising at a retroflexed steep angle from the main vessel and those that arise from a stented segment pose major challenges. Some techniques that may help access difficult side branches include reverse hook, balloon backstop, twin-pass catheter and deflecting tip guidewire.

HOW FAR ARE WE IN THE FIELD OF BIODEGRADABLE VASCULAR SCAFFOLDS?

Dr Sanjeeb Roy, Jaipur

Bioresorbable vascular scaffolds (BVS) are a promising new therapeutic option in Interventional Cardiology. Outcomes from the GHOST-EU registry showed acceptable rates of target lesion failure (TLF) at 6 months with BVS. Technical success was achieved in 99.7% of cases. There was TLF rate of 4.4% at 6 months, and the incidence of definite/probable scaffold thrombosis was 1.5% at 30 days and 2.1% at 6 months. This was higher than that observed with second-generation drug-eluting stent (DES). Strut size is an important factor that affects healing response after metal stent implantation. Data suggest that thick metal struts have delayed re-endothelialization and elicit more neointimal proliferation than a thinner strut design.

Currently, bioabsorbable scaffolds require a large strut thickness to provide sufficient radial support and prevent acute and late elastic recoil. BVS have been designed to provide mechanical support and drug delivery similar to the DES, followed by complete resorption over several years. Trials have demonstrated clinical noninferiority of the BVS compared with contemporary DES; however, outcomes such as higher rates of scaffold thrombosis are concerning. Physicians should follow a conservative approach with careful patient and lesion selection and follow meticulous implantation techniques that involve frequent intracoronary imaging for sizing, and pre- and post-dilation.

IN CONVERSATION WITH DR DAVINDER SINGH CHADHA

Dr Davinder Singh Chadha, Bangalore

Which factors should be considered while selecting a stent?

The factors to be considered while selecting an appropriate stent include duration of dual antiplatelet therapy, size matrix, stent deliverability, longitudinal stent deformation and type of polymer used for the delivery of the drug while selecting a DES.

Which bifurcation lesions are most appropriate for a two-stent strategy?

A two-stent strategy may be needed in true bifurcation lesion, where both main vessel and side branch have more than 50% stenosis with large plaque burden (Medina: 1-1-1, 1-0-1 and 0-1-1); large side branch (>2.5 mm diameter); important side branch that you do not want to lose; diffusely diseased side branch (>20 mm diseased segment); bifurcation with a take-off angle that would be difficult to rewire.

DIFFUSE DISEASE, TANDEM LESIONS (FFR/iFR)

Dr Prashant Jagtap, Nagpur

Complex coronary disease requires differentiation between diffuse and focal disease. Instantaneous wave free ratio (iFR) and iFR co-registration appears to be particularly useful for serial or diffuse disease assessment. Hyperemic flow (fractional flow reserve [FFR]): The proximal lesion limits the maximum blood flow into the distal lesion, while the distal lesion limits the maximum blood flow across the proximal lesion. When one lesion is removed, the FFR value of the remaining lesion is changed. Baseline flow (iFR): The microvasculature maintains the baseline distal flow. When a lesion is removed, flow does not change substantially. The iFR value of remaining lesion remains constant. Currently, there is insufficient data regarding long-term prognosis in iFR-guided revascularization.

WHICH PROCEDURE IS BETTER FOR UNPROTECTED LMCA DISEASE - STENTING OR BYPASS SURGERY?

Dr Subhash Chandra, New Delhi

Left main coronary artery (LMCA) stenosis refers to the reduction in the luminal diameter of LMCA by more

than 50%. LMCA stenosis is associated with higher mortality, and it is a strong independent predictor of mortality and morbidity in patients with coronary artery disease (CAD). With an average diameter of >3 mm, LMCA is theoretically suitable for stenting. However, the complex anatomy of LMCA may be associated with periprocedural complications and restenosis. Additionally, most LMCA lesions are at distal site presenting as bifurcation or trifurcation lesions, which is challenging for PCI. Complete revascularization by coronary artery bypass graft (CABG) is still the gold standard for treating unprotected LMCA stenosis; however, intravascular ultrasound (IVUS)-guided PCI is a reasonable alternative nowadays.

With improvements in the design in PCI devices such as DES and pharmacological treatment, increasing evidence now shows that PCI is a safe and effective revascularization strategy for patients with unprotected LMCA stenosis and multivessel CAD. SYNTAX study is the first large-scale randomized trial comparing the long-term outcomes after LMCA stenting with first-generation DES to CABG in patients with unprotected LMCA stenosis. No significant difference was found between PCI and CABG in mortality and major adverse cardiac and cerebrovascular event (MACCE) in patients with unprotected LMCA stenosis in low/intermediate SYNTAX score (<33). Target lesion revascularization (TLR) rate was higher in PCI group. However, CABG provided better long-term outcome including survival rate in patients with high SYNTAX score (≥33). Data suggest that stenting at LMCA can secure the upstream coronary artery flow and provide adequate perfusion to the large territory of left coronary artery system. Results from PRECOMBAT and EXCEL are also consistent with the results of LMCA stenosis cohort in SYNTAX study. The EXCEL trial revealed that among patients with LMCA disease and low or intermediate SYNTAX scores by site assessment, PCI with everolimus-eluting stents was noninferior to CABG in terms of the rate of the composite endpoint of death, stroke or myocardial infarction (MI) at 3 years.

PCI seems promising! Current guidelines also recommend PCI as an alternative to surgical revascularization in certain left main CAD groups.

HEMODYNAMIC SUPPORT DURING PCI - ECMO/LVAD

Dr Venkat Goyal, Mumbai

Issues in the implantation of durable ventricular assist devices (VADs) - *Proper patient selection*: recognizing

the patient who is too sick, with end-organ damage; recognizing the patient who is too debilitated or malnourished; recognizing the patient who needs biventricular support. *Timing of surgery*: especially important in the elderly 'destination' patient.

Which mechanical support should we use as a first-line option: The one you have experience with; start simple and think about the appropriate setting for the patient; before you transfer the patient, get all the details of medical and social history; ask for help. Intra-aortic balloon pump (IABP) should be used when the hemodynamic reserve is mildly decreased. Impella or Tandem Heart should be used when the hemodynamic reserve is low.

A DIALOGUE WITH DR RONY MATHEW

Dr Rony Mathew, Kerala

What is the burden of cardiovascular diseases in India?

Cardiovascular diseases (CVDs) have now become the leading cause of mortality in India. A quarter of all mortality is attributable to CVD. The Global Burden of Disease study estimate of age-standardized CVD death rate of 272 per 1,00,000 population in India is higher than the global average of 235 per 1,00,000 population.

The disease is also changing its trend with the changing times and has become more complex. It is therefore sometimes challenging for the physicians to take a decision on the treatment approach.

How do technologies help in CVD?

Interventional technologies for the heart have brought revolutionary changes in the way diseases are diagnosed and treated. In clinical practice, the decision to proceed with stenting/surgery and check the correct stent placement becomes particularly challenging when it comes to multivessel CAD, calcified blockages, long blockages, dissection and with blockages restricting 30-70% of the blood flow.

New technologies like optical coherence tomography (OCT) help in planning of interventional strategies and optimization before and after the stent deployment, particularly with complex diseases.

This new age imaging tool helps determine and improve patient outcomes by reducing the geographic misses, stent mal-apposition, under-expansion, etc., which may result in better long-term clinical results.

TETE-A-TETE WITH DR BALBIR SINGH

Dr Balbir Singh, Gurugram

How does OCT help in interventional cardiology?

OCT, with its high resolution, can provide complete information about the vessel that cannot be obtained with other modalities. OCT provides high quality detailed 3D views of the inside of coronary arteries to help assess the anatomical characteristics of the vessel and blockage. OCT produces clear, easy-to-understand views of vessel anatomy and composition of the blockage that can be helpful in determining and optimizing treatment strategy. It uses near-infrared light to provide almost histological/microscopic/fine tissue resolution of the coronary artery. These images can be acquired in less than 3 seconds and the overall procedure can be done in a few minutes. As a result, OCT can overcome many limitations of angiography as it offers 3D images which are 20x higher resolution than angiography and 10x higher resolution than the currently available ultrasound-based imaging tools. Physicians can navigate through the artery and visualize the blockage and stent to the minutest of detail to ensure optimal stent deployment.

What is the significance of OCT for the patient?

OCT is an imaging procedure that provides significant benefits in the assessment of CAD and stent implantation and follow-up. It is being used to validate stent placement, vessel injury and proper deployment of stent. OCT provides useful real-time information beyond that obtained by angiography alone, and impacts directly on physician decision-making. It improves clinical outcomes and ultimately the patient's well-being. Every patient has a different clinical need and OCT helps customize the treatment strategy basis the individualistic requirements. It saves the patients from undergoing incomplete/unnecessary procedures/surgeries and its associated risks. Thus, it also provides the patients with economic benefits.

WHAT IS THE CURRENT STATUS OF OCT, FOLLOWING THE ILUMIEN III FINDINGS?

Dr Robert Van Geuns, Netherlands

The comparison of OCT, IVUS and angiography has yielded mixed results in terms of choosing the best imaging modality to guide stent placement in PCI. OCT has been found noninferior to IVUS. Yet some questions remain to be answered before physicians can completely adopt newer, high-resolution intravascular imaging. The superior resolution of OCT is able to

detect malapposition and major dissection that are missed by IVUS and thus could potentially impact clinical outcomes. In ILUMIEN III, 450 patients undergoing PCI were randomized to OCT, IVUS or angiographic guidance. For the primary endpoint of final median minimum stent area, OCT guidance was noninferior to IVUS, but not superior. Additionally, it was not superior to angiography-guided stent placement either. Minimum and mean stent expansion were significantly greater with OCT-guided PCI than angiography-guided PCI, but similar to IVUS-guided PCI. Procedural success was also higher with OCT than with angiography. OCT could be of most benefit when the true patient and true lesion complexity that can benefit from this technology are identified.

IS DURABLE POLYMER DES BETTER THAN BIODEGRADABLE POLYMER DES?

Dr Chuck Simonton, USA

The polymer on the surface of the stent plays an important role as it comes in direct contact with the blood stream and artery wall when the stent is implanted. Recent data shows that the fluoro-copolymer on DES has documented anti-inflammatory and antithrombotic properties and has demonstrated fast healing response post stent implantation. Pre-clinical data with fluorinated copolymer has shown less thrombus than bare metal stents (BMS) surface. Biodegradable polymer DES (BP-DES) converts to BMS post drug-elution but, in clinical and pre-clinical trials, durable polymer DES have proven to be safer than BMS. BP-DES has still not been able to demonstrate superiority of safety and efficacy vs. current generation durable polymer DES in randomized clinical trials.

WHICH OF THE TWO DES - DURABLE POLYMER OR BIODEGRADABLE POLYMER - ARE PREFERRED IN PATIENTS WITH COMORBIDITIES AND COMPLEX LESIONS?

Dr Krishna Sudhir, USA

Whereas durable polymer DES have been studied in thousands of patients with comorbidities like diabetes, high bleeding risk, etc., along with complex lesions like chronic total occlusion (CTO), left main, etc., BP-DES has not been able to demonstrate superiority to durable polymer DES. BP-DES is also yet to prove superiority of safety and efficacy in complex lesions/patients. BP-DES technology is yet to show conclusive clinical evidence in terms of its safety and efficacy benefits to patients in comparison to existing durable polymer technology.

WHAT IS THE SIGNIFICANCE OF OCT IN BIFURCATION STENTING?

Dr Junya Shite, Japan

Intravascular OCT provides high-resolution images of the pathoanatomy, thrombus, wires and stent positions during PCI for bifurcation lesions. The information provided by OCT may prove crucial in improving PCI results and clinical outcomes after complex bifurcation treatment. Increasing amount of evidence confirms the feasibility of OCT in bifurcations, and specific steps where OCT may be advantageous in guiding bifurcation PCI have been identified. For instance, immediate automated online detection of the lumen area after pullback helps in rapid assessment of the vessel morphology and minimum lumen area. OCT with online 3D reconstruction helps obtain a 3D visualization of the lesion, such as stent cell figure, stent link position and Guidewire recross point, and plan an appropriate strategy accordingly. 3D images may provide a unique tool during complex intervention in bifurcation, and improve stenting results.

LEFT MAIN ISR

Prof. Dr Fazila-Tun-Nesa Malik, Bangladesh

To prevent left main in-stent restenosis (ISR): Proper sizing of stent is mandatory; proper imaging and physiological assessment can help decide whether PCI is required or not, and also helps optimize outcome; in case of ostial left main, overhang of stent should be avoided; in case of double stent strategy, final kissing is mandatory; POT and Re-POT should be done when required; proper control of diabetes and hypertension is essential; long-term dual antiplatelet therapy (DAPT) and high intensity statin should be considered in complex cases. **In case of left main ISR:** Proper assessment of situation by imaging is mandatory; in case of isolated ISR, drug-eluting balloons may be an option; in case of re-do PCI, proper preparation of bed is essential (NC balloon, cutting balloon, scoring balloon); newer generation DES should be chosen with proper sizing, good radial strength, radio-opacity, side branch accessibility and deliverability.

TISSUE PROLAPSE - INSIGHT FROM OCT

Dr DS Chadha, Bangalore

Tissue prolapse (TP) is a commonly noted finding on OCT in patients undergoing angioplasty. Thin-cap fibroatheroma (TCFA) is the most important

predisposing factor for the occurrence of TP. The pattern of TP and plaque volume determine its clinical significance. Recent studies have shown that the outcomes of TP may not be benign, as was reported in earlier studies. Rarity of the clinical events and common occurrence of this entity will make it difficult to design an adequately powered study to determine its significance.

STEMI BEYOND 48 HOURS

Dr Rajesh Vijayvergia, Chandigarh

Benefits of early reperfusion therapy - **<12 hrs:** Increased myocardial salvage, improved LV function and better survival; **12-24 hrs:** Mortality and combined endpoint of death, MI, stroke is significantly less with PCI than conservative approach; **12-48 hrs:** PCI vs. conservative approach - infarct size significantly reduced with PCI. **PCI after 48 hrs** (OAT trial) - Rates of primary endpoint (death, reinfarction and heart failure), fatal and nonfatal MI, death and Class IV heart failure (HF) were similar in PCI and medicine therapy groups. The 7-year rate of PCI of infarct-related artery (IRA) during follow-up was 11.1% vs. 14.7% in PCI vs. medical therapy arm. **Recommendation for delayed PCI** - Cardiogenic shock or acute severe HF; intermediate- or high-risk findings on pre-discharge noninvasive ischemia testing; spontaneous or easily provoked myocardial ischemia; patients with evidence of failed reperfusion or reocclusion after fibrinolytic therapy (as soon as possible); stable patients after successful fibrinolysis, ideally between 3 and 24 hrs; stable patients >24 hrs after successful fibrinolysis; delayed PCI of a totally occluded infarct artery >24 hrs after STEMI in stable patients.

CURRENT STATUS OF LEFT MAIN STENTING: POST EXCEL AND NOBLE

Dr Christoph K Naber, Germany

CABG remains the standard of care in anatomically complex left main disease with high SYNTAX scores. PCI is an excellent alternative in patients with low-intermediate SYNTAX scores, where the risk for surgery is high, or if patients have shorter life expectancy. PCI, as a revascularization strategy, comes with improved short-term outcomes but at the cost of increased rates of repeat revascularization. New recommendations should be patient-centered and based on early and long-term trade-offs of each procedure.

IS IT SPONTANEOUS CORONARY ARTERY DISSECTION? OCT GIVES THE ANSWER

Dr G Sengottuvelu, Chennai

With availability of sophisticated imaging such as OCT, we can identify the mechanism of acute coronary syndrome (ACS). We have shown plaque formation, rupture and calcific nodule and etiology of ACS. Spontaneous coronary artery dissection (SCAD) is an uncommon condition and is one of the important causes of ACS. Angiography is not a very good investigation to confirm the diagnosis of SCAD. Angiographic differentiation includes organized thrombus, calcific nodule, etc. OCT, though has to be done carefully without extension of intramural hematoma, gives very valuable information in confirming diagnosis. It delineates the location of entry point and the extent of intramural hematoma and appropriate management can be planned.

LEFT MAIN BIFURCATION STENTING AND LESSONS FROM DKCRUSH 5

Dr Viveka Kumar, New Delhi

Left main PCI should be attempted by experienced operators at high volume centers. While DK Crush is the preferred dedicated two-stent strategy for true bifurcation lesions, single stent strategy may be used in cases with insignificant left circumflex ostial disease.

FFR/iFR - OPTIMAL ACQUISITION AND INTERPRETATION

Dr Justin Davies, London

Revascularization performed based on angiography alone is no better than medical therapy. In a large French multicenter registry, FFR guidance reduced PCIs by 6%, but changed the treatment for 45% of patients. Making good iFR/FFR measurements: Proper preparation - Calibration and equalization; Guide catheter selection - No side holes/damping; IC nitrate - 200-300 µg; Proper normalization - No damping; Adequate hyperemia - 140 µg/kg/min IV adeno; Maintenance of good quality signal - Drift check at the end. Different grades of stenosis impact on different phases of the pressure waveform. Always look at the shape of the pressure waveform.

GLOBAL AGING AND ITS IMPACT ON CVD BURDEN AND TREATMENT

Dr Ian Meredith, USA

Global proportion of young children has always outnumbered elderly; however, that is about to

change. Aging inflection is driven by several factors: Improvement in public health; improved medical management of acute and chronic diseases resulting in greater longevity; falling fertility rates. By 2050, Asia will represent >60% of the global older population. Life expectancy has and will continue to increase globally. Chronic noncommunicable diseases (NCDs) are increasing and are leading causes of death. NCDs are leading causes of death in those aged >65 years. Patients aged ≥65 years are more likely to have multiple chronic conditions. 21st century global NCD health priorities and expectations include: CVD, hypertension, diabetes, obesity, cancer, dementia, depression/anxiety, degenerative/inflammatory arthritis, inflammatory bowel disease, alcohol and illicit drug use. A comprehensive research agenda is needed to address challenges relating to care of this 'high-need, high cost' population. Highest ranked research topics related to healthcare of elderly include: Health-related quality-of-life (QoL) in older adults; assessment tools (symptom burden, QoL); disability; tools to improve clinical decision making; interactions between medications, disease processes and health outcomes; implementation of novel (and scalable) models of care; role of caregivers; shared decision-making to enhance care planning; association between clusters of chronic conditions and clinical, financial and social outcomes. Leverage digital health technologies to create optimal solutions for aging populations. Simple, accessible solutions require access to a broad set of technologies. Don't accept convention. Challenge and change it.

OCT - IS IT EVIDENCE SUPPORTED?

Dr Jabir A, Cochin

In a recent systematic review and Bayesian network meta-analysis of 31 studies and 17,882 patients, PCI using either IVUS or OCT was associated with a consistent reduction in major adverse cardiac events (MACE) and CV mortality. Coronary angiography was rated as the worst strategy in rank probability analysis. **ILUMIEN I trial** - Based on pre-PCI OCT, the procedure was altered in 55% of patients by selecting different stent lengths (shorter in 25%, longer in 43%). Post-PCI OCT findings, such as malapposition, stent underexpansion and edge dissection, led to further optimization in 25%. Physician decision-making was affected by OCT imaging prior to PCI and post-PCI. **ILUMIEN III trial** - OCT-guided PCI using a specific reference segment external elastic lamina-based stent optimization strategy was safe and resulted in similar minimum stent area to that of IVUS-guided PCI. The

final median minimum stent area was 5.79 mm² (IQR 4.54-7.34) with OCT guidance, 5.89 mm² (4.67-7.80) with IVUS guidance and 5.49 mm² (4.39-6.59) with angiography guidance. OCT is an invaluable, proven, powerful visual tool to guide PCI. It provides excellent imaging, allowing exquisite assessment of the vessel wall and structure closest to histology in the cath lab.

LARGE THROMBUS - INTRACORONARY LYSIS

Dr Jayagopal PB, Kerala

Intracoronary thrombolysis has a role in the current era of primary PCI in certain subsets like patients with huge thrombus burden who present early; young patients who have mostly thrombus; patients with ectatic coronaries and large vessels. Tenecteplase is preferable because of ease of administration. In a series of STEMI patients with large thrombus burden treated successfully with low dose intracoronary thrombolysis, there was prompt and early ST resolution. There was improvement in TIMI flow and myocardial blush grade postlysis in all patients. Majority had recanalized infarct-related coronary artery thus obviating the need for stenting. It is worthwhile to do OCT in these patients.

CONQUER THE COMPLEX WITH DES - LATEST CLINICAL UPDATES

Dr Praveen Chandra, Gurugram

Complex PCI is on the rise. Expectations from an ideal stent - Good deliverability; good scaffolding; high radial strength with minimum recoil; good visibility; minimal foreshortening; side branch accessibility; appropriate metal to artery ratio; biocompatibility; optimal stent delivery system; variety of size and lengths; drug and polymer. EXCEL trial: In full 3-year data set, PCI with everolimus-eluting stent (EES) successfully met primary endpoint to show noninferiority to CABG in left main patients. EES outcomes were comparable to CABG in different patient populations, anatomies and lesion types. PCI with EES demonstrated lower rates of clinically significant depression at 1 month and 1 year. SENIOR trial: Among elderly patients (≥75 years; had stable angina, silent ischemia or an ACS; and at least one coronary artery with a stenosis of at least 70%) who have PCI, a DES and short duration of DAPT were better than BMS and a similar duration of DAPT with respect to the occurrence of all-cause mortality, MI, stroke and ischemia-driven target lesion revascularization (TLR). ABSORB trials at TCT: *Key messages* - Optimal implantation technique is associated with positive outcomes; long-term data suggests the potential benefits of a fully resorbed scaffold.

VALVE-IN-VALVE

Dr AB Gopalamurugan, Chennai

The Good: No major confusion on valve sizing; clear fluoroscopic landing zone (exceptions exist). **The Bad:** High risk of coronary occlusion in aortic tricuspid valve-in-valve (VIV); high risk of embolization/stroke; mitral and tricuspid VIV require specific work-up and expertise. **The Ugly:** Needs specific training in imaging; needs hybrid team; needs proctoring support for planning and initial experience building.

WHAT CAUSES CORONARY ARTERY ANEURYSMS AFTER DES IMPLANTATION?

Dr Upendra Kaul, New Delhi

Coronary aneurysms have been reported from 3 to 4 years following DES implantation. DES inhibit neointimal growth by eluting the drug locally, delay re-endothelialization and influence the remodeling process and lead to late incomplete stent apposition. Coronary aneurysms can develop as a result of exaggerated positive remodeling of the vessel wall. In some patients, this has been linked to bacterial arteritis or other predisposing factors such as Kawasaki disease. DES stents may also aggravate inflammation and elicit hypersensitivity reactions resulting in aneurysm formation. Mechanical factors, such as residual dissections, arterial wall injury due to oversized balloons and stents, high-pressure inflations and atherectomies, complicated procedures, contained perforations, or even vessel ruptures are all associated with early aneurysm formation following PCI.

DO YOU THINK OCT IS GOING TO CHANGE THE PRACTICE OF PCI?

Dr PC Rath, Hyderabad

OCT is changing the way we see coronary lesion pathophysiology. OCT allows for better visualization of lumen, plaque, thrombus, as well as stent apposition and dissection post-PCI. OCT can provide clinically useful and clinically actionable information about suboptimal stent deployment despite satisfactory angiographic images after PCI. It can show important residual pathology post-PCI that can change stent management strategies. OCT has distinct advantages in certain areas. With its high resolution, OCT is considered to be superior to IVUS for the assessment of the dissection, zones of incomplete stent apposition, tissue prolapse following PCI. Thrombus is poorly seen on IVUS; however, it is well visualized by OCT. OCT is very helpful in assessing stent apposition with overlapping stents.

WHAT IS THE IMPORTANCE OF OCT IN SAPHENOUS VEIN GRAFT ATHEROSCLEROSIS?

Dr Ajit Mullasari, Chennai

Left internal mammary grafts have high long-term patency rates; however, in current CABG practice a vast majority of patients also require saphenous vein grafts (SVG) as bypass conduits. SVG occlusion following surgery remains a significant limitation of CABG. OCT, but not IVUS, identifies clear features of atherosclerosis, including circumferential fibrous neointima, TCFA and adherent thrombus. High resolution imaging techniques such as OCT may provide significant insights into the causes of vein graft failure. OCT of culprit lesions of old SVGs in patients with ACS can show fibrofatty composition, relatively thin fibrous cap, plaque rupture, and thrombus, which correlate with the clinical spectrum of ACS.

The VEST study suggested that OCT is useful for characterizing luminal features of SVGs that are not clearly seen using IVUS. OCT was also helpful in identifying differences in SVGs with and without external stent support. Supported grafts were found to have a more uniform lumen than unsupported ones. This represents a significant finding since lumen irregularities are associated with suboptimal flow patterns that could lead to endothelial dysfunction and the development of significant atherosclerotic disease.

TETE-A-TETE WITH DR SANJAY MEHROTRA

Dr Sanjay Mehrotra, Bangalore

How do new vessel closure technologies help?

Vessel closure devices (VCDs) are novel devices that perform closure of opening of the artery after the angioplasty procedure. The main goal of a VCD is to provide immediate stoppage of bleeding of the artery and reduce access site complications. It reduces time for patient movement, hospital discharge and is more comfortable for the patient as compared to manual compression. Suture mediated closure (SMC) is a technique where a device delivers one or two stitches to the femoral artery that physically closes the access site after angiography/angioplasty. The SMC is a simple technique involving a single operator with no re-access restrictions and ability to confirm the hemostasis on the table.

What are the benefits of vessel closure technologies for the patients?

With the newer technologies, there is no pain of compression unlike manual pressure and patients

are able to sit up in bed soon after the procedure as there are minimal leg restrictions. It results in early leg movement where patients may be able to get out of bed and be discharged sooner from the hospital. Overall, with SMC, patient can go back home faster, with less chances of complications. VCDs also allow us to do procedures which require large sheaths, for example Transcatheter aortic valve replacement or implantation (TAVRS/TAVI) and endovascular procedure completely percutaneous, where one may have to expose the artery surgically to do such procedure. There are of course some limitations which one should be aware of in using these devices and limit situations where those are likely to fail.

WHAT IS THE ROLE OF OCT IN CHRONIC TOTAL OCCLUSION?

Dr Samuel Mathew, Chennai

PCI of chronic total occlusions (CTOs) is a challenging coronary intervention, and is associated with lower success rates, increased restenosis and reocclusion compared with non-CTO procedures. Patients with CTOs are often referred for CABG surgery. Angiography provides a two-dimensional image of contrast-filled lumen, and does not allow an accurate assessment of the plaque. OCT, on the contrary, allows high resolution imaging that can improve the understanding of the vascular response after stenting of chronically occluded vessels.

The ACE-CTO study accrued angiographic and clinical outcomes from 100 patients undergoing CTO PCI with the EES. OCT was performed 8-month post stenting in 62 patients. In all, 44,450 struts in 6,047 frames were analyzed. Of these, 9.3% were malapposed and 2.8% were uncovered. Fifty-five of 62 patients (88.7%, 95% confidence interval (CI) 78.5-98.4%) had at least one malapposed stent strut and 50 patients (80.7%, 95% CI 69.2-88.6%) had at least one uncovered stent strut. There has been advancement in the use of optical coherence reflectometry in CTOs. This is an FL fiber optic guidance system to navigate through CTOs. It is able to differentiate the tissue characteristics of arterial tissue including the calcified or noncalcified plaque and atherosclerotic lesions from arterial wall.

At follow-up in patients undergoing further angiography for ISR concerns, or because of other ongoing symptoms, OCT is an extremely useful modality to determine the vessel healing response to stent implantation.