

**CHRONIC TOTAL OCCLUSION****CRT-142****Assessment of Left Ventricular Function Pre and Post Percutaneous Coronary Intervention to Chronic Total Coronary Occlusion Doppler Tissue Imaging Study**

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**BACKGROUND** The rationale for the recanalization of a chronic total coronary occlusion is the possible improvement of left ventricular function through the recovery of hibernating myocardium. TDI can be used for assessment of both global and regional LV function with high temporal and spatial resolution. Purpose: Assessment of LV function before and after CTOPCI by PW-TDI.

**METHODS** The study enrolled 40 patients with CTO, 37 patients succeeded to complete the final follow up, 22 patients were without infarction in the territories of recanalized CTO vessel (group I), 15 patients with infarction in CTO territories of recanalized CTO vessel (group II). All were subjected to conventional echo Doppler and DTI examination. PW-DTI was used to assess velocity curves of basal and mid segments of LV walls. The following indices were measured Tp, Sv, E', A', E'/A', Acc IVC, IVRT, IVCT, CT and TEI index.

**RESULTS** After recanalization of CTO vessel by PCI non infarction group of patients showed highly significant improvement of LVEF% after 3 months follow up ( $P < 0.001$ ) while infarction group did not show any significant improvement ( $P = NS$ ). In LAD, LCX and RCA subgroup non infarction patients showed reduction in LVESv, increased FS% and EF% after 3 months follow up, also there was improvement of TDI parameters in the form of increased E' and ACC of IVC in all 3 subgroups and increased E'/A' in LAD and LCX and increased in Peak velocity of IVC and reduction of A' and time to peak of IVC in both LAD and RCA, only S wave velocity increased in LAD subgroup after 3 months F.U.

**CONCLUSION** Patients with CTO, Acc. of IVC measured by PW-TDI is differentiating early improvement after successful recanalization of CTO by PCI, Non infarction territories might recover at earlier stage than patients with MI.

**CRT-143****The Impact Of Presence Of The Chronic Total Occlusion On The Prognosis Of The Patients With Preserved Left Ventricular Function After Suffering From Acute Myocardial Infarction**

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**BACKGROUND** Chronic total occlusion (CTO) in the non-infarcted-related artery was reported to worsen immediate clinical outcome in patients with acute myocardial infarction (AMI). However, the prognosis of such patients with preserved left ventricular function has not been clarified yet. Our objectives were to evaluate whether the presence of CTO solely contributes to worsen the prognosis in the patients with well-preserved heart function after primary PCI.

**METHODS** We retrospectively evaluated 353 consecutive AMI patients with preserved left ventricular pump function (left ventricular ejection fraction; LVEF  $\geq 40\%$ ) who underwent primary percutaneous coronary intervention (PCI) in our hospital between January 2008 and December 2012. AMI patients complicated with cardiopulmonary arrest out of the hospital ( $n = 33$ ), having the left main trunk culprit lesion ( $n = 23$ ), and diagnosed after 24 hours from the symptoms onset ( $n = 62$ ) were excluded from total study population. The patients required to an extracorporeal membrane oxygenator (ECMO) for hemodynamic support during and after PCI were excluded because LVEF could not be evaluated accurately due to influence on hemodynamics by ECMO.

**RESULTS** Of those, 25 (7.0%) patients had CTO lesions in a non-infarct related artery (CTO patients). The LVEF estimated by echocardiography after primary PCI was similar between CTO patients and patients without CTO lesion (non CTO patients) ( $55.1 \pm 8.6\%$  vs  $58.0 \pm 9.4\%$ ;  $p = 0.07$ ). CTO patients were significantly more likely to be associated with cardiogenic shock ( $24.0\%$  vs  $7.6\%$ ;  $p < 0.05$ ) and to require intraaortic balloon pumping ( $56.0\%$  vs  $12.5\%$ ;  $p < 0.001$ ) compared with non CTO patients. Thirty-days mortality was significantly higher in CTO patients as compared with non CTO patients ( $12.0\%$  vs  $0.9\%$ ;  $p < 0.001$ ). By multivariate analysis, 30-days survival as well as cardiogenic shock were independently associated with CTO (odds ratio [OR] 20.42, 95% CI 3.38-123.29,  $p < 0.001$ , OR 3.99, 95% CI 1.46-10.92,  $p < 0.01$ , respectively).

**CONCLUSIONS** In patients with AMI, even if their LVEF were preserved, CTO was strongly associated with cardiogenic shock and high mortality.

**CRT-144****Percutaneous Intervention in Chronic Total Coronary Occlusions Due To In-stent Restenosis: A Multicenter Registry**

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**BACKGROUND** Limited data exist on the treatment of chronic total occlusions (CTO) due to in-stent restenosis (ISR). Native coronary artery CTO is relatively rare after stenting and it is an understudied subgroup of CTO interventions.

**METHODS** All patients undergoing an attempt of percutaneous coronary intervention (PCI) due to occlusive ISR were included in our registry among 15 hospitals. CTO was defined as a coronary obstruction with TIMI flow 0 with an estimated duration of more than 3 months. A total of 233 consecutive interventions in CTOs due to ISR were reported. Basal characteristics and angiographic features were reported. Our study sought to evaluate PCI related success rate, procedural techniques and outcomes on follow up among PCI-Success and PCI-Failure groups. Ischemia driven target lesion (TLR) and target vessel (TVR) revascularization, binary restenosis, thrombosis and MACE (TLR or TVR or CABG or all cause MI or cardiovascular death) rates were also evaluated among both groups. Analyses were performed using the software packages SPSS 15.0.

**RESULTS** Mean age was  $63 \pm 11$  y, and 79% were men. The target lesion was located in the right coronary artery in 47%, left anterior descending in 34.6%, circumflex in 18%. Basal and angiographic features in both groups were similar. The CTO was successfully treated in 83% of cases. Drug-eluting stents were used in 88% of cases to treat the lesion. Procedural success was lower in circumflex artery when comparing with other target vessels (86% vs. 69%;  $p = 0.008$ ). Coronary dissection (5.2%) and coronary perforation without pericardial tamponade (4.5%) were more frequent complications.

The median length of the follow-up was 21.2 months and the follow-up rate was 87%. No routine angiographic follow-up was done. In the PCI-success group, ischemia driven TLR, TVR and binary restenosis/reocclusion rates were 14.9%, 15.6% and 21.5% respectively. Two definitive stent thrombosis, 1 probable and 2 possible were reported (ARC criteria). MACE at 12 months was 18% in PCI-Success group vs. 20.6% in PCI-Failure group ( $p = NS$ ). Cardiac and total mortality were 2.8% vs. 7.9% ( $p = 0.15$ ) and 4.5% vs. 10.5% ( $p = 0.23$ ) respectively.

**CONCLUSION** Our registry showed success rates in ISR CTO interventions comparable to those achieved in de novo coronary occlusions. Clinically relevant restenosis, TVR and TLR rates remain high in our population, even taking into account that the lack of angiographic follow-up could infra-estimate the results. There is a nonsignificant trend towards less MACE and mortality in PCI-Success group.

**CLOSURE DEVICES****CRT-145****ProGlide® Femoral Artery Closure Is Safer, More Efficacious and More Cost-effective With Greater Patient Satisfaction in Patients Who Ambulate Early Following Diagnostic Cardiac Catheterization Compared To Manual Compression**

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**OBJECTIVE** This was a prospective, single-center study evaluating the efficacy and cost effectiveness of early ambulation (within 30 min) following femoral artery closure with the

ProGlideR suture-mediated vascular closure device (PD) in patients undergoing diagnostic cardiac catheterization compared with manual compression.

**BACKGROUND** It is unclear whether early ambulation with ProGlide is safe and translates into patient satisfaction and cost savings as compared with manual compression (MC).

**METHODS AND RESULTS** Inclusion criteria were met in 170 patients (85 PD and 85 MC patients). Following hemostasis, patients were ambulated 20 ft within 30 min (PD) or after the requisite 4 h recumbent time (MC) if feasible.

The primary endpoint was time-to-ambulation (TTA) following device closure. We also directly compared the safety of closure, times-to-hemostasis (TTH), -ambulation (TTA) and -discharge (TTD) with MC and, using a fully allocated cost model, performed cost analysis for both strategies. Multivariate analysis was used to determine predictors of patient satisfaction. The primary endpoint of safe, early ambulation was achieved following closure (mean of  $27.1 \pm 14.9$  min; 95% confidence interval [CI]

25.2-30.2). Predictors of patient satisfaction in the PD group were absence of pain during closure, decreased TTA, and drastic reductions in TTD; the latter contributed indirectly to significant cost-savings in the PD group (1,282.3 ± 118.3 vs. 2,271.4 ± 121.1 dollars, respectively;  $P < 0.001$ ) and incremental cost savings by strategy also favored closure over MC (\$89,124.5).

**CONCLUSIONS** ProGlide is safe and effective for femoral artery closure in patients who ambulate within 30 min after cardiac catheterization; all of which translated into improved patient satisfaction and substantial cost savings.

## COMPLEX CORONARY INTERVENTION

### CRT-146

#### In-Drug Eluting Stent Restenosis Treated By Paclitaxel Coated Balloon Angioplasty: Results From The French Prospective Garo Registry

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**BACKGROUND** The clinical benefits of paclitaxel-coated balloon angioplasty (PCB) have been extensively studied in bare metal stent in-stent restenosis (BMS-ISR) and in drug eluting stent in-stent restenosis (DES-ISR). The GARO Registry is a dedicated 'all comers' study in an unselected patient population with DES-ISR to elucidate the clinical benefits of PCB angioplasty for various types of DES-ISR in a routine clinical setting.

**METHODS** Under the supervision of the GARO (Groupe Angioplastie de la Région Ouest) all data for patients treated by the PCB based on the Paccocath® Technology (SeQuent® Please, B.Braun Melsungen AG) for In DES-ISR were collected in a prospective data base. Quantitative analyses of the angiography of the procedure were made by an independent core lab. The primary endpoint was clinically driven TLR at 9 months while secondary endpoints consisted of the clinically driven rates of MACE, MI and cardiac death.

**RESULTS** A total of 206 patients (67.7 ± 10.3 y, 80.6% male gender) with 210 DES-ISR lesions were recruited in 15 French study centers. Major cardiovascular risk factors were diabetes (41.3%), hypertension (69.4%), hypercholesterolemia (75.7%) and history of smoking (47.6%). STEMI (3.9%) and NSTEMI (13.1%) were present at baseline. Lesion characteristics were 3.02 ± 0.64 mm (reference vessel diameter) and 14.6 ± 6.5 mm (lesion length). Treated vessels were LAD (37.6%), RCA (28.6%), LCX (27.6%) and others (6.2%). Cypher-ISR (36.7%) was the most common type of DES-ISR followed by Taxus-ISR (20.0%), Xience-ISR (20.0%), Promus-ISR (8.1%), Endeavor-ISR (5.7%) and others (9.5%). ISR patterns were focal (52.9%) and diffuse (47.1%). 9-month follow-up was available in 90.8% (187/206) of all patients. The duration between DES implantation and restenosis was 3.0 ± 2.4 years.

The 9-month TLR rate was 7.0% (13/187) whereas incidences of MI and cardiac death were 4.3% (8/187) and 2.1% (4/187) respectively. The composite MACE rate at 9 months was 10.2% (19/187).

**CONCLUSIONS** Up to date this is the largest prospective registry in an unselected patient population with DES-ISR treated with PCB angioplasty. The rates for TLR and MACE were low and seem to be an attractive alternative treatment option despite the lack of reimbursement in France.

### CRT-147

#### The Efficacy and Clinical Outcome of Rotational Atherectomy with Second Generation Drug-Eluting Stents

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**BACKGROUND** Treatment of calcified lesions with balloon angioplasty has been associated with a low success rate and high procedural complications. Rotational atherectomy (RA) improved acute results, but a high restenosis rate remained a problem. Therefore, the purpose of this study was to evaluate the clinical and angiographic outcome of patients with complex and calcified lesions treated with a combination of RA and second-generation drug-eluting stent (DES) implantation.

**METHODS** Consecutive 55 patients received combination therapy of RA and second-generation DES implantation at de novo lesion of native coronary artery with severe calcification between June 2009 and December 2012. Zotarolimus-eluting stents (ZES), biolimus-eluting stent (BES), and everolimus-eluting stents (EES) were used in 14, 7, and 34 patients, respectively. 39 patients (ZES, BES, and EES were used in 12, 6, 21 patients) received one-year follow-up angiography. The clinical and angiographic outcome was compared among those 3 groups of different DES.

**RESULTS** Only one patient was dead (a cause was unknown). Target lesion revascularization (TLR) rate was 0% among 3 groups. The late loss was larger in ZES than in BES or EES (ZES vs. BES vs. EES: 0.37±0.20mm vs. 0.20±0.10mm vs. 0.16±0.15mm,  $p < 0.05$ ).

**CONCLUSION** The clinical outcome of 3 second-generation DES used in combination with RA was very good, although the culprit lesions were complex with severe calcification. Combination therapy of RA and second-generation DES appeared acceptable.

### CRT-148

#### A Study Of Conformability in Everolimus-eluting Bioresorbable Vascular Scaffolds to Metal Platform Coronary Stents in Long Lesions

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**INTRODUCTION** Implantation of stiff permanent metallic implants alters blood rheology especially at the inflow and outflow edge of the stents probably contributing to early and late stent failure. Short Polymeric Bioresorbable vascular scaffolds (BVS) have shown to have less impact on the natural curvature of the stent vessel compared to Metal platform stents (MPS). The impact of long BVS on vessel curvature is unknown.

**OBJECTIVES** The aim of this study was to determine if there are any significant differences in terms of curvature of the treated vessel after the deployment of either a metallic stent or a polymeric scaffold device in long lesions.

**METHODS** This retrospective study compares 32 patients who received an MPS (Xience, Abbott Vascular, Santa Clara, CA, US) with 32 patients treated with the everolimus-eluting bioresorbable vascular scaffold (BVS-Absorb, Abbott Vascular, Santa Clara, California). All patients received 1 BVS Absorb or MPS with a length of 28mm deployed singly in long coronary lesions. The primary end point measured was the relative region curvature (%) evaluated with dedicated software by angiography.

**RESULTS** There were 22 (68.8%) males in each group. There was no difference in median age [BVS vs MPS: 59.6 yrs vs 64.9 yrs,  $p = 0.453$ ]. There was a significant difference in clinical presentation of ACS/STEMI (BVS vs MPS: 68.8% vs 40.6%,  $p = 0.024$ ). The left anterior descending artery was the most treated vessel in both groups (BVS vs MPS: 46.9% vs 40.6%,  $p = 0.857$ ). Pretreatment length was 22.19 mm vs 20.38 mm in the BVS and MPS groups respectively ( $p = 0.803$ ). There was no significant differences in reference vessel diameter, minimal lumen diameter and percentage diameter stenosis in both groups. Pretreatment Diastolic curvature (DC) was greater in the BVS group compared with the MPS group (0.305 cm<sup>-1</sup> vs 0.257 cm<sup>-1</sup>,  $p = 0.803$ ). There was a significant decrease in median DC in the MPS group post-treatment than pre-treatment (from 0.257 cm<sup>-1</sup> to 0.199 cm<sup>-1</sup>,  $p = 0.001$ ). There was a decrease in median DC in the BVS group post-treatment which trends towards significance (from 0.305 cm<sup>-1</sup> to 0.283 cm<sup>-1</sup>,  $p = 0.056$ ). Median Percentage relative change in DC was significantly lower in the BVS group compared with the MPS group (BVS vs MPS: 7.48% vs 29.4%,  $p = 0.024$ ). By univariate analysis, device use was an independent predictor of change in curvature ( $p = 0.022$ ).

**CONCLUSIONS** In the deployment of long coronary scaffolds/ stents (28mm in length), bioresorbable vascular scaffolds provides better conformability compared with MPS.

### CRT-149

#### Role of Plaque Characterization By 64-slice Multi Detector Computed Tomography in Prediction of Complexity of Percutaneous Coronary Interventions

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**BACKGROUND** Percutaneous coronary intervention (PCI) nowadays has become standard of care in symptomatic coronary artery disease (CAD). Lesion localization, severe calcifications, and vessel tortuosity may challenge the skills of the operator and increase the risk of procedural complications. Coronary computed tomography angiography (CCTA) has become a promising non-invasive imaging technique, pre-procedural lesion characterization by CCTA might contribute to predict PCI complexity in extensive and complex CAD.

**AIM** To determine the predictive value of coronary plaque characterization as detected by 64- slice multi-detector Computed tomography(MDCT) in prediction of the procedural complexity of elective percutaneous coronary non CTO intervention.

**PATIENTS** Retrospective study involving 45 patients in whom PCIs were performed for 60 single coronary lesions within 6 months of pre-procedural CCTA at ICC hospital.

**METHODS** All patients had MDCT coronary angiography The CT derived parameters included in our study was: calcium scoring, plaque anatomy (site, side branch involvement, degree of stenosis, morphological type), plaque length, volume, density and area.

**RESULTS** Median Agatston score was significantly higher in lesions with complex as compared to those with non-complex interventions with a mean of 266.51 ± 155.93vs 168.76 ± 70.53 with the P value = 0.034. Regarding plaque density, Hounsfield Units were higher in lesions with complex as compared to non-complex PCI (371.85 (48.0 to