DES with biodegradable polymer in this setting are limited and therefore the NOBORI CTO registries were conducted.

Methods: In 2 large, prospective, multi-center registries, 504 out of 14134 patients treated with Nobori DES had at least one CTO lesion revascularized. All adverse events were adjudicated by an independent clinical event committee. The primary endpoint was Target Lesion Failure (TLF) at 1 year.

Results: CTO patients were 60±11 years old, 82.9% males, having prior MI, prior PCI and previous cardiac surgery in 46.9%, 27.9% and 6.4% of patients. Multiple vessels were treated in 35.5% of patients (2.1±1.40 lesions per patient) with an average 1.49±0.07 stents per lesion. Antegrade approach and single wire technique were most frequent choice. Other techniques used included CTO dedicated wires, OTW balloon, microcather, rotational atherectomy and cutting balloon. Mean diameter stenosis before procedure was 91±16% and TIMI 0 and 1were recorded in 59% of all lesions treated (not all were CTO). Mean fluoros time was 37±18 minutes and contrast volume was 276±135 mL. After procedure mean diameter stenosis was 7.1±17% and TIMI1 and 1 were observed in only 30% of the lesions. Up to 1-month, there was 1death, 3 MIs (0.6%) and no TLR. Four CD (1.2%) and three TLRs (0.9%) were reported up to one year follow-up bringing the total TLF rate to 2.4%. Target vessels non-target lesion revascularizations were performed in 2 patients (0.6%). Only one probable subacute stent thrombosis (0.2%) occurred. In the cohort of patients followed at 3-year, 3 patients suffered a CD (3.1%), 1 had an MI (1.0%), 3 underwent TLR (3.1%) and TLR rate was 6.2% with no late or very late stent thrombosis.

Conclusions: Treatment of CTO with Nobori DES showed excellent outcomes. Particularly appealing is that stent thrombosis was very rare despite the multiple overlapping stents. The low rate of procedural complications and adverse events up to 3 years suggests that this stent is a valuable treatment option for patients with CTO who are considered candidates for PCI.

TCT-379
A Comparison of the Success Rates and Long-Term Outcomes after percutaneous coronary intervention Between In-stent Restenosis and de novo Chronic Total Occlusion lesions
Seung-Young Roh1, Hyang Joon Jou1, Jae Hyoung Park1, Chul-Min Ahn1, Soon Jun Hong1, Cheol Woong Yu1, Do-Sun Lim1
1Korea University Anam Hospital, Seoul, Korea, Republic of

Background: In-stent restenosis (ISR) chronic total occlusion (CTO) lesions have been known as one of the most challenging subsets for percutaneous coronary intervention among all CTO population. There have been few reports about ISR CTO intervention. Therefore; we compared the success rates and long-term outcomes after PCI between ISR and de novo CTO lesions.

Methods: This study was a study of 368 patients undergoing intervention for CTO from 1998 to 2014. We compared the target lesion recanalization (TLR) success rate and 5-years follow up outcomes including major adverse cardiovascular and cerebrovascular event (MACCE) between the patients underwent PCI for ISR CTO (n=40) and de novo CTO (n=328) lesion. TLR success was defined as recovery of Thrombolysis in Myocardial Infarction (TIMI) grade 3 and residual stenosis diameter below 30%.

Results: No significant difference was observed in clinical and angiographic characteristics excepted dueployed stent length (20.8±7.22mm in ISR vs 31.9±25.7mm in de novo group, p=0.006) and used contrast dose (220±92.2ml in ISR vs 269.3±111ml in de novo group, p=0.003) between both groups. Success rate of TLR was 80% of the ISR CTO group and 83.8% of de novo group (p=0.50). In the ISR CTO group, the success rate of re-stenosed drug eluting stent (DES) using provisional BMS was inferior to that of re-stenosed bare metal stent (BMS) using provisional BMS (21.4% vs 74.0%, p=0.003). The 5-year MACCE-free survival of ISR CTO group was significantly lower than de novo group (61.6% vs 98.9%, p=0.034). On multivariate analysis, ISR CTO was associated with higher incidence of MACCE (hazard ratio 2.29, 95% confidence interval 1.046 to 5.030).

Conclusions: Procedural success rate for ISR CTO lesion was similar to that of de novo CTO lesion. But, ISR CTO group showed worse long term clinical prognosis than de novo CTO group.

TCT-380
The Prolyl Hydroxylase Inhibitor BHQ(FG-2216) Stabilises HIF-1α and Upregulates VEGF in vitro: A Potential Strategy For Difficult CTO Lesions in Patients.
Georgina A. Barnett1, Emily Flashman1, Damien J. Kelly2, Christopher J. Schofield1, Anthony Gershlick1
1University of Leicester, Leicester, United Kingdom, 2University of Oxford, Oxford, United Kingdom

Background: Up to 30% chronic total occlusions (CTO) cannot be revascularized by conventional angioplasty. Therapeutic enhancement of the athero-collateral circulation may offer a novel solution. Previously, we investigated stimulation of endothelial cell (EC) angiogenesis via stabilized hypoxia inducible factor (HIF) utilizing two prolyl-hydroxylase inhibitors. We reported diethyl oxalylglycine (DEOG) a prolyl- hydroxylase inhibitor that is a mimetic CTO model and showed BQ(FG-2216), trialled for use in man for alternative indications, induced a dose dependent pro-angiogenic response in primary human EC in vitro. We now report molecular mechanisms underlying the novel action of BQ(FG-2216).

Methods: Human umbilical vein ECs (HUVECs) were treated with 500μM BQ(FG-2216) for up to 24 hours. (100μM CoCl2 was used as a positive control for HIF-1α stabilization). Expression of HIF-1α protein from cell lysates was analyzed by Western blotting. Quantitative PCR was used to examine the expression of vascular endothelial cell growth factor (VEGF) mRNA from treated EC.

Results: Stabilization of HIF-1α protein was demonstrated in EC after treatment with BQ(FG-2216) along with a 1.45 fold increase in VEGF mRNA expression, after one hour of treatment (Figure).

Conclusions: We have confirmed that BQ(FG-2216) upregulates HIF-1α in EC and show evidence for a mechanism involving the angiogenic factor VEGF, implying that we plan to translate this therapy. On-going work includes the deployment of polymer-coated BQ eluting stents with in vitro and in vivo evaluation to develop an effective treatment for difficult CTOs in man.

TCT-381
The Safety And Efficacy Of The "Hybrid Approach" To Chronic Total Occlusions: Insights From A Contemporary Multicenter US Registry
Rohan V. Menon1, Khuldoon Alaswad1, William Lombardi2, Katrina L. Mithoe2, J. Aaron Grantham2, Steven P. Marso3, Barry Rutherford4, Siddharth M. Patel5, Nagendra R. Pokala5, Banana Rangan5, Tejasfud T. Michael6, Anna Kotsi6, Owen Mogabgb7, Daniel Sherber7, Vishal G. Patel8, Sabah Banerjrie8, Craig Thompson9, Emmanouil Brilakis10
1UT Southwestern/VA North Texas Healthcare System, Dallas, TX, 2Appleton Cardiology, Appleton, WI, 3Peacehealth St. Joseph Medical Center, Bellingham, WA, 4St. Joseph Hospital, Bellingham, WA, 5Associate Professor of Medicine, Kansas City, MO, 6St. Luke’s Health System, Kansas City, Missouri, 7University of Missouri- Kansas City, Kansas City, Missouri, 8University of Texas Southwestern Medical Center, Dallas, TX, 9Yale University School of Medicine, New Haven, CT, 10VA North Texas Healthcare System and UT Southwestern Medical Center, Dallas, TX

Background: The hybrid approach to coronary chronic total occlusion (CTO) crossing was developed to optimize procedural efficacy, efficiency, and safety.

Methods: We examined the procedural techniques and outcomes of 287 consecutive CTO cases performed using the hybrid approach between August 2011 and June 2013 at 4 US centers: Appleton Cardiology, Appleton Wisconsin; St. Joseph Medical Center, Bellingham Washington; St. Luke’s Health System’s Mid-America Heart Institute, Kansas City, Missouri; and VA North Texas Healthcare System, Dallas, Texas.

Results: Mean age was 64±10.2 years and 89% of the patients were men, with high prevalence of diabetes mellitus (45%), peripheral arterial disease (17%), prior percutaneous coronary intervention (60%) and prior coronary artery bypass graft surgery (36%). Most target CTOs were located in the right coronary artery (60%), followed by the left anterior descending artery (21%), left circumflex (17%), posterior descending artery (1%) and left main coronary artery (1%). Dual injection was used in 74%. Overall, antegrade wire escalation was used in 63%, antegrade dissection re-entry in 38% and retrograde in 45%. Among successful cases, the final successful crossing technique was antegrade wire escalation in 41%, antegrade dissection an re-entry in 27%, and retrograde in 32%. The initial crossing strategy was successful in 60% of the patients, whereas 33% required an additional 1 to 4 crossing strategies. Technical success was achieved in 93% and major procedural complications occurred in 2% (death in 2 patients, one due to tamponade and one due to vascular access complication; and myocardial infarction in 3 patients). Mean contrast volume, fluoroscopy time, and air kerma radiation exposure were 275±149.0 mL, 45.9±30.7 minutes, and 3.87±2.25 Gray, respectively.

Conclusions: Application of the hybrid strategy to CTO crossing resulted in high success and low complication rates among a varied operator group and hospital structure, further supporting the value of the hybrid approach in crossing these challenging coronary lesions.