Eastern Hospital, Yokohama, Kanagawa, 5Saiseikai Yokohama-City Eastern Hospital, Yokohama, Japan, 6Saiseikai Yokohama-city Eastern Hospital, Yokohama, Kanagawa

Background: Stent fracture (SF) after DES implantation has recently become an important concern because of its potential association with in-stent restenosis and stent thrombosis. However, the incidence and clinical relevance to SF after second generation DES (zotarolimus-eluting stent: ZES, everolimus-eluting stent: EES, and biolimus-eluting stent: BES) remain unclear, so the aim of study is to reveal clinical impact of SF after second generation DES deployment.

Methods: A total of 1734 patients with 2185 lesions undergoing second generation DES implantation and follow-up angiography within 12 months were performed from April 2009 to September 2012 in a single center. We divided into SF group and non-SF group and assessed the rates of SF and major adverse cardiac events (MACE), defined as death, myocardial infarction, stent thrombosis, and target lesion revascularization (TLR), retrospectively.

Results: We had obtained 1826 lesions follow-up angiography. (83.6%) The mean clinical follow up period was 788±15 days. There were no significant differences in patient background and lesion characteristics except HD. (SF group: 30.4% versus non-SF group: 4.2%; p<0.001) However, there was no significant difference in the calcification lesion between the two group. (NS.) SF was observed in 26 of 1823 lesions (1.4%). The rate of TLR and late stent thrombosis were significantly higher in the SF group than in the non-SF group (33.3% versus 5.4%; p<0.001 and 3.7% versus 0.1%; p=0.02). MACE was significantly higher in the SF group than in the non-SF group (44.4% versus 10.9%; p<0.001).

Conclusions: SF after second generation DES implantation occurs in 1.4% of lesions and is associated with higher rate of TLR, MACE, and late stent thrombosis.

TCT-652 Influence and Predictors of Late Catch-up Phenomenon After Drug-eluting Stent Implantation

Masanobu Ohya1, Kazushige Kadota2, Seiji Habara2, Takeshi Tada1, Hiroki Tanaka1, Yuzuki Fuku1, Tsuyoshi Goto1, Kazuaki Mitsudo1 1Kurashiki Central Hospital, Okayama, Japan

Background: We aimed to evaluate the incidence and predictors of late catch-up phenomenon after first and second generation drug-eluting stent (DES) implantations.

Methods: From 2002 to 2012, 10996 lesions received DES implantation: first generation, 6242 sirolimus-eluting stents (SES); second generation, 3391 everolimus-eluting stents (EES) and 1363 biolimus-eluting stents (BES). Mid-term angiographic follow-up was scheduled at 8 months and late-term at 20 months. We analyzed 6849 lesions (SES, 3871; EES, 2153; and BES, 825) after late-term follow-up, which were free from in-stent restenosis (ISR) and target lesion revascularization at mid-term follow-up. ISR was defined as restenosis >50% and late catch-up phenomenon as the first ISR over one year after DES implantation. The follow-up duration was two years.

Results: The late catch-up phenomenon rate was not significantly different between EES and SES (5.8% vs. 7.1%, p=0.06) but significantly lower in BES than in SES (4.4% vs. 7.1%, p=0.004). The predictors of late catch-up phenomenon (p<0.10, univariate analysis) were hypertension, diabetes, hemodialysis, ostial lesion in the right coronary artery or in the left circumflex artery, ISR lesion, reference diameter <2.5 mm, percent diameter stenosis before (>75%) or after (>25%) DES implantation, angulated lesion, lesion length >30 mm, chronic total occlusion lesion, left main branch stenting, and DES types, from which 10 variables in the final multivariable regression model obtained by the forward stepwise method are shown in the table.

Conclusions: BES implantation is a negative predictor of late catch-up phenomenon.

TCT-653 Association Between Native Coronary Artery Disease Progression And Instant Neoatherosclerosis: A Long-term Angiographic And Optical Coherence Tomography Cohort Study

Masanori Tanikawa1, Stephan Windeker1, Sergei Zuega2, Sandro Baumgartner3, Thomas Zanchin1, Peter Jan1, Bernhard Meier1, Lorenz, Raber1 1Bern University Hospital, Bern, Switzerland, 2University of Bern, Bern, Switzerland

Background: The association between native coronary artery disease progression in non-target lesion (TL) segments and the process of in-stent neoatherosclerosis (NA) five years after DES implantation is unknown.

Methods: The SIRTAx-LATE OCT population was analyzed for evidence of in-stent NA as assessed by OCT five years after DES (sirolimus-eluting stent (SES) and paclitaxel-eluting stent (PES)) implantation. NA was defined as the presence of fibrocalcific plaques or fibroatheromas within the neointima of previously implanted DES with longitudinal extension of >1.5mm. Native coronary artery disease progression in non-TL segments was evaluated by serial quantitative coronary angiography (QCA) in all arterial segments with diameter of at least 1.5mm and length of at least 10mm. The minimal lumen diameter (MLD) was serially assessed within matched segments at baseline and five year angiographic follow-up, or prior to any non-TL revascularization. The change in MLD between baseline and follow-up was calculated as endpoint associated to angiographic disease progression. The clinical endpoint was any non-TL revascularization assessed throughout 5 years by an independent clinical event committee.

Results: A total of 88 patients with 88 lesions were available for OCT analysis 5 years after DES implantation. In-stent neoatherosclerosis was observed in 14% of all stented segments with the majority of patients having fibroatheromas (12.5%) followed by fibrocalcific plaques (5.6%). A total of 716 untreated native coronary artery segments (8.1:1 to 1.7 segments/patient) were serially evaluated by OCT. The change in MLD between baseline and five year angiographic follow-up was significantly higher in patients with OCT evidence of NA (0.25mm, 95%CI 0.15-0.35) as compared with patients without evidence of NA (0.13mm, 95%CI 0.09-0.17, p=0.002). Consistent with the angiographic findings, any revascularization in non-TL segments occurred more frequently in patients with evidence of NA (79%) as compared with patients without evidence of NA (47.2%) (p=0.03).

Conclusions: Patients with angiographic and clinical evidence of native coronary artery disease progression in non-TL segments are more likely to develop in-stent neoatherosclerosis.

TCT-654 Effects of Bioabsorbable Versus Durable Polymer Drug-eluting Stent on Neoatherosclerosis : Optical Coherence Tomography Analysis

Hee woong Yu1, Jae Young Choi1, Hyung Joon Joo1, Jae Hyung Park1, Soon Jun Hong1, Do Sun Lim1 1Korea University Anam Hospital, Seoul, Korea, Republic of

Background: Neoatherosclerosis after drug eluting stent (DES) implantation is known to be related with increased risk of late restenosis and stent thrombosis. Studies have suggested that inflammation by polymer may be one of several mechanisms, but there have been a few data about bioabsorbable polymer DES (BP-DES) versus durable polymer DES (DP-DES) on relevant clinical outcomes between BP-DES and DP-DES by Optical Coherence Tomography (OCT) analysis.

Methods: A total of 292 patients undergoing OCT analysis after DES implantation were enrolled, who were divided into 2 groups according to stent type [BP-DES (n=107) and DP-DES (n=185)]. OCT analysis was performed within 2 years after stent implantation. Neoatherosclerosis was defined as presence of more or 1 of as follows; plaque rupture, thrombus, neovascularization, plaque erosion, microvessel, macrophage and thin of thick fibrous cap atheroma. The primary end point was the incidence of neoatherosclerosis, and the secondary end point was the occurrence of MACE (major advanced cardiac events; death, myocardial infarction, target lesion revascularization, or stent thrombosis).

Results: Demographic, clinical, lesional and procedural characteristics were not significantly different between the two groups. The incidence of neoatherosclerosis was lower in the BP-DES group than in the DP-DES group (16.8% vs. 30.8%, p=0.008). The rate of MACEs did not show significant difference between two groups (9.3% vs. 14.7%, p=0.208). The Incidence of neoatherosclerosis was not significantly different at 1 year but was lower in BP-DES group than in the DP-DES group between 1 and 2 years (13.9% vs. 28.9%, p=0.007).

Conclusions: In this 2 year follow-up study, patients undergoing BP-DES implantation had lower rates of neoatherosclerosis than patient with DP-DES, but it did not translate into better clinical outcomes.

TCT-655 Contribution of In-stent Neoatherosclerosis to Late Stent Failure Following Bare Metal and 1st- and 2nd-Generation Drug-Eluting Stent Placement: An Autopsy Study

Fumiyuki Otsuka1, Kenichi Sakakura1, Kazuyuki Yagah1, OSCAR D. SANCHEZ1, Robert Katys1, Elena Lachid1, David R. Fowler1, Frank D. Kolodgie2, Barry R. Davis1, Matthew Abel1, Renata2 1CVPath Institute, Inc., Gaithersburg, MD, United States, 2Office of the Chief Medical Examiner, Baltimore, MD

Background: in-stent neoatherosclerosis has emerged as an important contributing factor for late stent failure including very late stent thrombosis (VLST) and restenosis. Clinical imaging modalities, however, have limited capability of evaluating the presence and characteristics of neoatherosclerosis. The aim of the current pathologic study was to investigate the prevalence of neoatherosclerosis in lesions with late stent