TCT-685

Neointimal Hyperplasia and Persistent Vascular Remodeling after Implantation of Everolimus-eluting Stent versus Sirolimus-eluting Stent. Intravascular Ultrasound Results from EXCELLENT Study

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Background: The purpose of the study is to compare neointimal hyperplasia and persistent arterial remodeling after implantation of everolimus-eluting stent (EES) versus sirolimus-eluting stent (SES) using IVUS.

Methods: The study population was a subgroup of 293 patients from the EXCELLENT trial, a randomized study comparing EES and SES for the treatment of de novo native coronary artery lesions (total n=1,400, 3:1 randomization). There were 222 patients in the EES group and 71 patients in the SES group in whom serial IVUS investigation was performed at pre- and post-PCI, and 9-month follow-up.

Results: Before clinical and angiographic characteristics were similar between the two groups. At 9 months, percent neointimal vessel obstruction did not differ between EES and SES (2.67±4.1% vs. 2.27±4.3%, p=0.494). However, percent changes in vessel volume (3.93±13.49% vs. 8.92±18.46%, p=0.038) and plaque/media (P&M) volume (3.72±17.28% vs. 10.70±22.14%, p=0.017) within the stented segment were smaller with EES versus SES. Positive persistent arterial remodeling defined as an increase in vessel volume >10% (27.0% vs. 42.3%, p=0.015) and late acquired stent malapposition (4.1% vs. 19.7%, p<0.001) were observed less frequently with EES versus SES.

Conclusion: EES and SES were similarly effective in reducing neointimal hyperplasia. However, positive persistent arterial remodeling and late acquired stent malapposition occurred less frequently with EES.

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Optical Coherence Tomography Assessment of Neointimal Coverage According to the Presence Or Absence Of Malapposed Struts After Drug-eluting Stent Implantation

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Background: Although stent malapposition and incomplete neointimal coverage may predispose to drug-eluting stents (DES) thrombosis, no data exists regarding the relationship between the malapposed struts (MS) and uncovered struts (US) on optical coherence tomography (OCT), especially depending on the extent or portions of malapposition.

Methods: From Yonsei OCT registry, a total of 306 lesions in 271 patients after DES implantation were enrolled in this study. OCT examination was performed at 1-month (n=7), 2-month (n=10) and 3-month (n=3) follow-up after EES implantation. Cross-sectional OCT images were analyzed at 1 mm intervals. The strut apposition to the vessel wall and neointimal coverage on struts were evaluated by OCT. Main neointimal hyperplasia (NH) thickness was also measured.

Results: The rate of neointimal coverage was 37%, 48% and 60% at 1, 2 and 3-month follow-up after EES implantation, respectively (Table). The incidence of malapposition was less than 1%. Intra-stent thrombus was observed in 3 stents among 20 stents.

Conclusion: This study showed that vessel healing was better with second-generation DES within 3 months after implantation, suggesting that EES might have a favorable vascular response in relatively early duration.

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Neointimal Coverage of Everolimus-Eluting Stent at 1, 2 and 3 Months Follow-up: Evaluation by Optical Coherence Tomography

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Background: Confirming complete neointimal coverage after drug-eluting stents (DES) implantation is clinically important, because incomplete stent coverage is the significant predictor of late stent thrombosis. Previous study using optical coherence tomography (OCT) demonstrated that stent struts of the first-generation DES still remain uncovered at mid-term after deployment. On the other hand, 98% of the stent struts were covered with uniform and thin neointima at 8 months after everolimus-eluting stent (EES) implantation. However, the time-course up to 3 months analyses of neointimal coverage in patients with EES (Xience V and PROMUS) has not been reported. The aim of this study was to evaluate vessel responses at 1, 2 and 3 months follow-up after EES implantation using OCT.

Methods: A total of 20 stents in 14 patients with de novo native coronary lesions were enrolled in this study. OCT examination was performed at 1-month (n=7), 2-month (n=10) and 3-month (n=3) follow-up after EES implantation. Cross-sectional OCT images were analyzed at 1 mm intervals. The strut apposition to the vessel wall and neointimal coverage on struts were evaluated by OCT. Mean neointimal hyperplasia (NH) thickness was also measured.

Results: The rate of neointimal coverage was 37%, 48% and 60% at 1, 2 and 3-month follow-up after EES implantation, respectively (Table). The incidence of malapposition was less than 1%. Intra-stent thrombus was observed in 3 stents among 20 stents.

Conclusion: This OCT study demonstrated that DES with malapposition, especially with a higher % MS, showed a significantly higher incidence of US in the struts without malapposition, as well as in the whole struts.

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2 years long-term follow-up optical coherence tomographic findings compared with 9 months after implantation of everolimus-eluting stents

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Background: Late or very late stent thrombosis after drug-eluting stent (DES) implantation may be related with incomplete neointimal coverage. Optical coherence tomography (OCT) is valuable modality for the assessment of stent strut coverage. We evaluated long-term (2 years) effect of everolimus-eluting stent (EES) for tissue coverage and apposition of stents using OCT compared with 9 months follow-up.
Results: OCT was evaluated in 30 EESs (28 patients) diagnosed as acute coronary syndromes. The percent difference of uncovered struts was analyzed according to follow-up period (9 month vs. 2 year).

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Results: OCT was evaluated in 30 EESs (28 patients) diagnosed as acute coronary syndromes. The percent difference of uncovered struts was analyzed according to follow-up period (9 month vs. 2 year).

Conclusion: Conventional risk scores designed to predict primary cardiovascular events did not work well in patients with pre-existing acute coronary heart disease presenting with ACS. Future studies regarding a new scoring system which can predict secondary cardiovascular events are warranted.

TCT-690
Age and Sex Related Plaque Composition Of Non Culprit Lesions In Patients with Acute Coronary Syndromes: The PROSPECT Study
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Background: Many scoring systems have been devised in order to identify a patient population at high risk of primary cardiovascular events. However, whether these scoring systems can predict secondary events in patients who have established coronary heart disease is unknown.

Methods: 697 pts with acute coronary syndromes underwent 3-vessel coronary angiography and radiofrequency intravascular ultrasound after PCI of all culprit lesions in the PROSPECT trial. Subsequent major adverse cardiovascular events (MACEs: cardiac death, cardiac arrest, myocardial infarction, or rehospitalization due to unstable or progressive angina) were adjudicated to be related to either originally treated (culprit) lesions or untreated (nonculprit) lesions. The median follow-up period was 3.4 yrs. In 419 pts <65 yrs of age, 3 scoring systems - Framingham, PROCAM and SCORE – were calculated and related to subsequent events.

Results: The 3-year cumulative rate of MACE was 18.3%. Events were adjudicated as culprit lesion-related in 13.0% and nonculprit lesion-related in 10.5%. The median (interquartile range) of each scoring system (Framingham, PROCAM, and SCORE) was 6 (4-8), 39 (32-45,) and 3 (2-5). The quartile distribution of these scores had no association with total, culprit-associated, or nonculprit-associated MACE. In addition, no score predicted total (Figure A), culprit-associated (Figure B), or nonculprit-associated MACE (Figure C).

Conclusion: Conventional risk scores designed to predict primary cardiovascular events did not work well in patients with pre-existing acute coronary heart disease presenting with ACS. Future studies regarding a new scoring system which can predict secondary cardiovascular events are warranted.