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Angiographic follow-up after rapamycin- and paclitaxel-stent implantation in coronary artery disease

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[Purpose] To investigate the effectiveness of DES in the real world in Chinese population, the patients with DES implantation were followed by angiography. [Methods] Two hundred and forty three Cypher stents were implanted in 231 lesions of 201 patients. Two hundred and seventy eight Taxus stents were implanted in 242 lesions of 220 patients. [Results] The procedural Characteristics and clinical outcome are represented in the table. Table Quantitative Angiography and Clinical Outcome The angiographic pattern of the restenosis was different between two groups. In Cypher group, 84.6% of resrenoses were focal in segments. Contrarily, 50% of restenoses were diffuse in stents in Taxus group. [Conclusion] Cypher and Taxus DES are both effective in reducing neointimal proliferation. The restenosis , TLR, stent thrombosis and aneurysm are identical in two groups. The angiographic pattern of restenosis were different between the Cypher and Taxus. The restenosis in the complex lesion is not low in this study.

Characteristics	Cypher(n=98)	Taxus(n=86)	p
RVD (mm)	2.81±0.34	2.87±0.35	>0.05
In stent MLD (mm)			
After procedure	2.49±0.37	2.48±0.33	>0.05
Follow-up	2.42±0.38	2.10±0.41	<0.05
Late loss in stent (mm)	0.08±0.36	0.37±0.56	<0.05
Restenosis (%)	13.2(13)	14.0 (12)	>0.05
TLR (%)	5.1(5)	6.9 (6)	>0.05
Stent thrombosis (%)	2.49(5)	1.36(3)	>0.05
Aneurysm (%)	3.06 (3)	1.16 (1)	>0.05

M-96

Two hemodialysis patients who restenosed after Cypher implantation

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(case 1)The patient was 68-years man. Coronary risk factor is high blood pressure. The hemodialysis introduction was done due to the chronic renal failure with the polycystic kidney. On September 7, 2004, he underwent implantation of Cypher3x18mm and Cypher2.5x23mm to RCA(#3-#4AV:75-99%) after Rotablator. However, on February 15, 2005, follow-up coronary angiography was performed and he had 90% restenosis in # 4AV Stent. POBA was enforced to this part. (case 2)The patient was 73-years old man. Coronary risk factors were diabetic mellitus, and high blood pressure. The hemodialysis introduction was done due to the chronic renal failure due to diabetic mellitus. On October 28, 2004, he underwent implantation of Cypher3x13mm and Cypher3x18mm to Cx (#11-#13:75-90%) after Rotablator. However, On March 6, 2005, he had the chest pain. Coronary angiography was performed and he had 90% restenosis in Stent. POBA was enforced to this part. Two cases presented the similar IVUS findings, in which stent-strut were not able to be observed. The IVUS image was different from that of usual intimal hyperplasia.

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IVUS assessment of lesions with Sirolimus-eluting stent deployment failure (Japanese)

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Background: There is little intravascular ultrasound (IVUS) information available in Japanese patients with sirolimus-eluting stent (SES) failure. **Methods and Results:** We evaluated the pattern of SES failure occurring after implantation of SES in Japanese patients. From August 2004 to March 2005, we treated 168 patients by using 322 SESs. IVUS evaluation was performed in 4 lesions of 4 patients (0.02%) with SES failure [One diabetic patient and one HD patient]. There were 1 subacute and 1 late thromboses. In a patient with subacute thrombosis, IVUS revealed stent underexpansion (case 1). There was a patient with late thrombosis that resulted in congestive heart failure. There were no specific IVUS findings in this case (Case 2). One patient had two intra-stent restenoses and another patient had an intra-stent restnosis and an edge restenosis. There was no case with a gap between stents. In a patient with multiple intra-stent restenoses, IVUS had strut mal-distribution and stent underexpansion at the restenotic sites (Case 3). In another patient with intra-stent restenosis and edge restenosis, IVUS revealed strut mal-distribution and edge residual stensis at the procedure (Case 4). **Conclusion:** The IVUS findings in SES failure in Japanese were also stent underexpansion, strut mal-distribution, and residual edge stenosis.

M-98

Impact of peri-stent plaque burden on neo-intimal hyperplasia after Sirolimus-eluting stent implantation

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Background: Little is known about intimal hyperplasia development (IH) after sirolimus-eluting stent (SES) implantation. We sought to investigate whether peri-stent plaque burden could affect the magnitude of IH after SES implantation. **Methods:** Six month follow-up volumetric intravascular ultrasound (IVUS) analyses were performed in 49 pts treated with SES. IVUS measurements were performed at 5 cross-sections: minimum lumen area (MLA) and at 5.0 and 10mm proximal and distal to the MLA site. To assess the relation between plaque and 6-month IH, those sections were divided into 2 groups according to an eccentricity index (maximal/minimal plaque thickness) (eccentricity: index >2 and non-eccentricity: index <2). **Results:** IVUS data are shown in Table. IVUS measurements were similar among the eccentricity and the non-eccentricity group. Combining both groups, there was no significant relationship between the eccentricity and IH CSA (r=0.188, p=0.1) or IH thickness (r=0.161, p=0.2). **Conclusion:** Peri-stent plaque burden was not associated with the amount of neointima after SES implantation.

	Eccentricity	Non-eccentricity	P
Lumen area, mm^2	4.9±2.3	5.5±2.1	NS
EEM area, mm^2	13.8±4.5	16.1±4.2	NS
P&M area, mm^2	7.1±3.1	8.6±2.8	NS
Stent area, mm^2	6.8±1.9	7.6±2.2	NS
Stent eccentricity	0.88±0.05	0.89±0.04	NS
IH area, mm^2	1.8±1.6	2.1±1.6	NS
IH thickness, mm	0.5±0.3	0.6±0.4	NS

EEM=external elastic membrane, P&M=plaque&media, IH=intimal hyperplasia

M-99

Evaluating coronary angioscopic findings before and after drug-eluting stenting with Cypher

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Purpose:Drug Eluting Stent(DES) inhibitied the neointimal hyperplasia, and so decreased the restenosis rate of long term period, but there is no report about the coronary angioscopic findings about DES. Method: Since January, 2000 to September, 2004 we evaluated initial outcome of 5 DES cases and 6 Bx-velocity bare metal stent(BMS)cases using the coronary angioscope in acute and the chronic phase.Examination items were as below.ICES findings ; thrombus(white, red, mixture)and the amount of thrombuses (large amount(more than 50%) small amount (less than 50%)) and plaque (yellow, light yellow, white), and the plaque coverage of the stent in acute phase(complete, partial incomplete) and the stent coverage of the intimal hyperplasia in chronic phase at 6 month follow up period(transparent and complete, partial incomplete, incomplete)Result: 1.In DESgroup, the thrombus did not detect at acute phase, however BMS showed 83%red thrombus and 17%mixed This was considered to be based on the difference in a patient background(ACS100%v.s.20%).2.There is no difference between the two group in the plaque coverage of the stent in acute phase.3.In the BMS the stent coverage of the intimal hyperplasia in chronic phase shows transparent0%,complete100%, partial incomplete0% and incomplete0%.The thrombus did not detected at a chronic phase in BMSgroup. And we willexpect to evaluate ICES findings of DESgroup in chronic phase in the meeting.Conclusion.In an coronary angioscopic findings, the acute outcome of DES are similer in that of BMSgroup. Chronic phase results are now going.

M-100

Intimal covering over stents: bare metal versus drug-eluting stents

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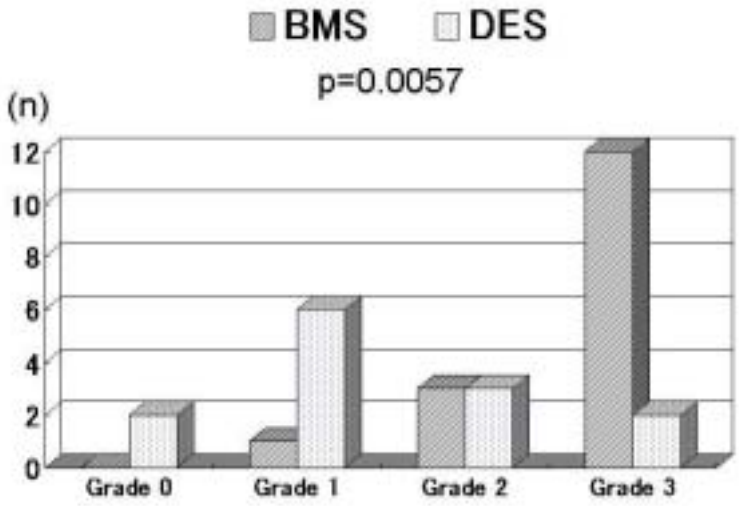
The aim of this study was to compare intimal covering after bare metal stent (BMS) and drug eluting stent (DES) implantation. Methods: Thirteen stented segments (12 Cypher, 1 Taxus and 16 BMS) were examined by angioscopy 3 month after stent implantation. Intimal covering was graded as: *grade 0* = struts were similarly exposed at the time of implantation; *grade 1* = struts were covered, but not embedded; *grade 2* = struts were embedded under the neo-intima; and *grade 3* = struts were fully embedded and invisible by angioscopy. Results: See Table for the intimal covering grades. Existence of thrombi appeared similar. Conclusions: Intimal covering 3 months after DES appeared incomplete as compared with BMS. Antiplatelet regimen may be mandatory beyond 3 months after DES.



M-101

Stent-in-stent for acute or sub-acute thrombosis after coronary stenting: 5 case reports

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Case1: Effort angina, 2 Wiktor stents were implanted in the diffuse lesion in the LAD. Acute closure (AC) and subacute thrombosis (SAT) occurred after stenting. We bailed out by full coverage of the Wiktor stents with 3 Palmaz-Schats stents. **Case 2**: Effort angina, A Wiktor stent was implanted in the calcified lesion in the LAD. AC occurred and in spite of repeat ballooning, fresh thromobi were formed. We bailed out by full coverage of the Wiktor stent with 3 Palmaz-Schats stents. **Case 3**: Effort angina, 2 GFX stents were implanted in the diffuse lesion in the LCX. AC occurred and a GFX stent was implanted additionally. SAT occurred and we bailed out by stent-in-stent with 2 Multilink stents. **Case 4**: ACS, A BX velocity stent was implanted in the RCA. IVUS revealed the plaque prolapse and we performed some additional ballooning. AC occurred and we bailed out by stent-in-stent with a Nir stent. **Case 5**: ACS, A Driver stent was implanted in the LAD. IVUS revealed the plaque prolapse and thrombi within the stent. In spite of repeat ballooning, fresh thromobi were formed and we bailed out by stent-in-stent with a Multilink stent. From the IVUS images of each case, the cause of stent thrombosis might be as follows. In case 1, 2; lack of scaffolding and inadequate stent expansion, In case 3; plaque prolapse due to coil stens, In case 4,5; large plaque burden which could not be scaffolded in spite of slotted tube stents.

M-102

Efficacy of drug-eluting stents for in-stent restenosis

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Background: In-stent restenosis(ISR) remains an important limitation after stent implantation.Drug eluting stent(DES) have been demonstrated to be highly effective for de novo lesions.However the effectiveness of DES for ISR remains unclear.Methods and results: Forty-four lesions(LAD 20,RCA 18,LCX 6)in 43 patients with ISR after bare metal stenting were treated with drug eluting stents(DES:Cypher).Fourteen lesions were recurrent ISR. Procedural success was achieved in all cases.Using DES size was 3.1+0.3mm and length was 26.7+7mm.Multiple stenting to cover ISR completely were needed in 13 lesions.All stents were deplayed over 16atm.IN hospital and three months follow-up, recurrent restenosis appeared in only 1 lesion and other MACE was none.Conclusion: The DES implantation in patients with ISR lesions was easy and simple.It might be effective for prevention of recurrent restenosis. DES may be superior to other strategy to ISR.

M-103

Treatment of in-stent restenosis with the sirolimus-eluting stent: acute and mid-term results

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Background: The treatment of in-stent restenosis(ISR) remains one of the major therapeutic challenge for the interventional cardiologist. The purpose of this study was to assess the clinical and angiographic benefits of Sirolimus-eluting stents(SES) in ISR lesions. **Methods and Results:** 155 lesions in 134 consequtive patients treated by SES from June 2004 to March 2005. Of the 155 lesions, 23 in-stent restenosis lesions (23 patients) treated with SES by way of intravascular ultrasound. Important patient characteristics were: age 68&plusmn9 years, 70% men and 52% diabetes mellitus. Focal(type I), diffuse(type II), proliferative(type III) and occlusive(type IV) ISR were observed in 34%, 26%, 26% and 19% respectively. RCA-ostial lesions was present in 2 lesions. At pre-procedure, the mean lesion length was 15.3±7.4mm, reference diameter 2.67±0.65mm and minimal lumen diameter (MLD) 0.99±0.55mm. The minimal stent cross-sectional area (CSA) was 17.1± 5.9mm^2, minimal lumen CSA 2.5±1.1mm^2 and % plaque area(%PA) 79.6±7.6%. At post-procedure, MLD was 2.87±0.45mm, minimal stent CSA 17.9±6.4mm^2, minimal lumen CSA 7.4±2.8mm^2 and %PA 52.5±10.4%. Procedual success was obtained in 100% of patients, without a major adverse cardiac events. 6 months follow-up angiography was performed in 10 lesions. Binary restenosis rate was 10% (one RCA-ostial lesion). Target leson revascularization was performed in the restenosis lesion due to stent-fracture. **Conclusion:** The treatment of in-stent restenosis lesions with Sirolimus-eluting stent is safe and has good acute and mid-term results.

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Non-invasive assessment of left-main coronary stenting with 64-slice computed tomography

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Multidetector computed tomography (MDCT) is now accepted as a useful modality in imaging of the coronary artery. We applied this technique to evaluation of intra-stent restenosis after coronary percutaneous angioplasty of the left main coronary artery. We will present several cases of successful imaging of stented left main coronary artery using 64-slice MDCT (Sensation 64, Siemens Medical solution; scan parameters, 330ms gantry rotation, 64*0.60-mm-slice collimation). In conclusion, CT angiography with 64-slice MDCT is effective to visualize proximal coronary stents after PTCA. It is less invasive and could be an attractive alternative of traditional angiography for patients.

M-105

Evaluation of coronary artery stenting detected by multi-slice CT angiography

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Purpose: Recently, several studies have reported that Sub-millimeter 16-slices multidetector-row computed tomography (MDCT) is useful for coronary imaging. Moreover, it is possible for evaluation of coronary imaging non-invasively than conventional coronary angiography (conventional CAG). We evaluated coronary stents by 16-slices MDCT-CAG in comparison with conventional coronary angiography as the standard of reference. Methods: Assessable 43 stents from 35 consecutive patients who underwent MDCT angiography before conventional CAG were evaluated by 16-slices MDCT, excluding invisible stents due to severe partial volume effect lesions (n=4) and motion artifact lesions (n=6). Coronary stents were expressed by multiplanar reformatted images and evaluated. In conventional CAG and MDCT angiography, diameter stenosis was divided into 4 groups (0%, 25%, 50%, 75%), and there were no diameter stenosis>75%. Results: In 43 coronary stents, there were various coronary stents (Multi-Link Plus 5, Multi-Link Tristar 7, Multi-Link Penta 8, Nir 7, S670 15, BX Velocity 1). Diameter stenosis of each coronary stents was positive correlation (r=0.29/1.00/0.96/1.00/0.93) excluding BX Velocity. And more, diameter stenosis of all coronary stents was a strong positive correlation (r=0.89) between conventional CAG and MDCT angiography. When it divided into 2 groups (diameter stenosis <=50% and >50%), sensitivity and specificity of assessable coronary stents were 100% (41/41 and 2/2) in each group. Conclusion: It is useful for evaluation of coronary stents by16-slices MDCT-CAG as well as conventional CAG.

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Neo-intimal coverage following drug-eluting stent implantation under current anti-platelet therapy: An angioscope evaluation study

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Neo-intimal covering after stent implantation is poorly understood, particularly after recently emerged drug eluting stents (DES).**Methods:** To assess the intimal covering following DES as well as bare metal stents (BMS) , we studied 20 patients (13 DES and 7 BMS) using angioscopy. The patients received both aspirin (100 mg) and ticlopidine (200 mg) per day until follow-up (5.2 +/- 2.5 months). The degree of the neo-intimal covering and the existence of thrombi were evaluated at follow-up. Intimal covering was graded as: *grade 0*= struts were similarly exposed as the time of implantation; *grade 1*= struts were covered, but not embedded; *grade 2*= struts were embedded by the neo-intima; and *grade 3*= struts were fully embedded and invisible by angioscopy. **Results:** See Table for the grades. White-thrombi were not observed. Mural red thrombi were seen in 4 DESs. **Conclusions:** Under long-term anti-platelet regimen, neo-intimal covering was completed in BMS, but was not in DES. This may implicate different strategy for the anti-platelet therapy following DES.

	Grade 0	*Grade 1*	*Grade 2*	*Grade 3*	*P*
DES (n=13)	2	6	3	2	0.0043
BMS (n=7)	0	0	0	7	