Methods 37consecutive patients with CTO lesion in LAD coronary artery who underwent PCI as well as SPECT/CTA fusion imaging were divided into the following three groups based on the myocardial perfusion index before PCI: (A) no severe cardiac perfusion defects (n=4); (B) reversible cardiac perfusion defects (n=18); (C) irreversible cardiac perfusion defects (n=15).

Results Overall successful rate of recanalisation for CTO was 75.7% (28/37). No statistical difference of perfusion abnormality was observed 6 months after PCI in group A. In group B, SPECT/CTA fusion imaging demonstrated that cardiac perfusion abnormality was significantly decreased 6 months after PCI ($21\pm7.9\%$ vs $28\pm9.8\%$, $p<0.05$). Left ventricular ejection fraction (LVEF) significantly enhanced as evaluated by echocardiography (51 ± 8.3 % vs 43 ± 6.2 %, $p<0.05$) as well as SPECT ($50\pm7.7\%$ vs $45\pm8.5\%$, $p<0.05$) compared with baseline. Quality of life improved as evidenced by 6-min walk distance (6MWD) (426.4 ± 33.8 m vs 347.3 ± 24.6 m, $p<0.05$) and angina pectoris score index (60.8 ± 13.5 vs 53.7 ± 11.2, $p<0.05$). Moreover, patients in group C also benefited from PCI therapy: a decrease in cardiac perfusion abnormality, an increase in LVEF and an improvement in quality of life.

Conclusion PCI exerts long-term functional and clinical benefits in patients with CTO lesion in LAD coronary artery, particularly in patients with reversible cardiac perfusion defects. SPECT/CTA fusion imaging may serve as a gatekeeper to evaluate the outcomes of patients with CTO lesion in LAD coronary artery.

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e0470 **ULTRASOUND GUIDED THROMBIN INJECTION FOR THE TREATMENT OF IATROGENIC POSTCATHETERISATION PSEUDOANEURYSMS IN 76 CASES**

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Ultrasound-Guided Thrombin Injection For The Treatment Of Iatrogenic Post-Catheterisation Pseudoaneurysms In 76 Cases Objective The purpose of this study was to evaluate the safety and efficacy of ultrasound-guided thrombin injection (UGTI) for the treatment of iatrogenic post-catheterisation pseudoaneurysms (PSAs).

Methods A total of 76 patients (36 men, 40 women, 63.4 ± 10.8 years) with iatrogenic PSAs were treated by UGTI.

Results The mean diameter of the aneurysms was $(3.01\pm1.27)\times(1.65\pm0.67)$ cm, 93.4% (71/76) of the patients were under antiplatelet therapy with aspirin or clopidogrel or both, and additional low molecular weight heparin. The mean dose of bovine thrombin was 619 ± 259 ($150\sim1400$) u, single injection was primary successful in 69 patients, of which thrombus formation occurred in 1 patient in the superficial femoral artery after successful closure of the PSA, surgical embolectomy was performed. A second injection was required in 2 of the remaining 7 patients. 5 patients were treated by ultrasound-guided compression because of incomplete thrombosis after UGTI. 1 patient had acute allergy after 2 min of thrombin injection which was resolved by antiallergic therapy. The total success rate was 98.7% (75/76). reperfusion was detected in 4 patients within 72 h follow-up, recurrence rate of UGTI for PSAs was 5.3% (4/75), 3 patients were successfully managed by a second thrombin injection and another was treated with ultrasuound-guidance compression, there is no recurrence at 30days clinical follow up. ultrasound follow-up. At the 2 months were performed in 15 patients. The size of PSAs were significantly reduced from (2.90 ± 1.17), (1.47 ± 0.54) cm to $(0.94\pm0.72)(0.44\pm0.35)$ cm ($p<0.001$).

Conclusion UGTI is a safe, rapid, well-tolerated and effective noninvasive method for the treatment of iatrogenic PSAs and should be considered as first-line therapy.

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e0471 **CLINICAL INVESTIGATION OF TRANSRADIAL APPROACH FOR EMERGENT PERCUTANEOUS CORONARY INTERVENTION IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION**

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Objective To evaluate the safety and efficacy of transradial approach for emergent percutaneous coronary intervention in patients with acute myocardial infarction.

Methods We analysed data from our single-center registry on 560 consecutive patients between January 2001 and October 2009. All the patients were respectively randomised to transradial group (n=260) and trans-femoral group (n=300). A dedicated doctor was appointed to collect such indicators as follows: puncture time, CAG time, PCI time, x-ray exposure time, complication rates associated with puncture such as puncture site bleeding, haematoma, pseudoaneurysm, and the major adverse cardiac events.

Results 1. There were no significant differences in the baseline characteristics and angiographic findings between two groups. 2. There was no significant differences in CAG time (8 ± 2.4min vs 7.6 ± 2.0min), PCI time (30 ± 4.8min vs 28.6 ± 4.4 min), and x-ray exposure time (4.6 ± 1.4 min vs 4.4 ± 1.3 min) between two groups. 3. The complication rates of TRA was 2.32%(6/260), compared to 6.0% (18/300) in the control group ($p<0.05$).

Conclusion Transradial approach for emergent percutaneous coronary intervention in patients with acute myocardial infarction is safe and efficacy, and it is suggested that the transradial approach should be used in patients with acute myocardial infarction.

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e0472 **TWO-YEAR CLINICAL EFFICACY OF SIROLIMUS—VERSUS PACLITAXEL—VERSUS ZOTAROLIMUS-ELUTING STENTS IN DIABETIC PATIENTS**

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Background Drug-eluting stents (DESs) have drastically improved the angiographic and clinical outcomes of percutaneous coronary intervention (PCI) in patients (pts) with diabetes mellitus. However, little has been known whether the different types of DESs have similar efficacy in Asian diabetic pts.

Methods A total of 305 diabetic pts who underwent PCI with Sirolimus (SES group; Cypher, n=102 pts, 247 lesions), Paclitaxel (PES group; Taxus, n=138 pts, 414 lesions) or Zotarolimus (ZES group; Endeavour, n=65 pts, 138 lesions)-eluting stents were enrolled. Angiographic outcomes at 6 months and cumulative clinical outcomes up to 2 years were compared among these 3 groups.

Results These 3 groups had similar baseline clinical and procedural characteristics except that SES group had longer stent length and PES group had smaller stent diameter as compared with other groups. Six-month angiographic outcomes showed that SES group had less binary restenosis, lower restenosis percent, and late loss as compared with the other 2 groups. Major clinical outcomes were similar among the 3 groups up to 2 years except a trend towards lower incidence of TVR in SES group as compared with the other 2 groups. ZES group had 1 acute, 1 subacute, and 1 late stent thrombosis (ST), while the other 2 groups didn't have ST throughout the follow-up period (Table).

Conclusions Although SES had favourable angiographic outcomes at 6 months as compared with PES and ZES, these angiographic benefits were not translated into better clinical outcomes in patients with diabetes up to 2 years. Table: Six-month Angiographic and 2-year clinical outcomes Variable, n (%) SES Group (n=102 pts, 247 lesions) PES Group (n=138 pts, 414 lesions) ZES Group (n=65 pts, 138 lesions) p value Stent diameter, mm 2.95±0.36 2.86±0.38 3.03±0.44 <0.001 Stent length, mm 26.87±6.49 25.61±7.08 24.10±5.87 0.008 Binary restenosis 12 (7.5) 40 (15.9) 16 (19.8) 0.013 Restenosis percent, % 19.45±17.86 28.51±21.93 32.44±25.71 <0.001 Late loss, mm 0.45±0.49 0.85±1.72 0.73±0.69 0.008 Cardiac death 2 (2.0) 1 (0.7) 1 (1.5) 0.696 Q-wave MI 0 (0) 0 (0) 0 (0) 1.000 Non-Q-wave MI 0 (0) 0 (0) 0 (0) 1.000 TLR 6 (5.9) 16 (11.6) 9 (13.8) 0.190 TVR 8 (7.8) 22 (15.9) 12 (18.5) 0.092 TVR-MACE 13 (12.7) 25 (18.1) 15 (23.1) 0.218 Stent thrombosis 0 (0) 0 (0) 3 (4.6) 0.004.

Table   Six-month Angiographic and 2-year clinical outcomes

Variable, n (%)	SES Group (n=102 pts, 247 lesions)	PES Group (n=138 pts, 414 lesions)	ZES Group (n=65 pts, 138 lesions)	P value
Stent diameter, mm	2.95±0.36	2.86±0.38	3.03±0.44	<0.001
Stent length, mm	26.87±6.49	25.61±7.08	24.10±5.87	0.008
Binary restenosis	12 (7.5)	40 (15.9)	16 (19.8)	0.013
Restenosis percent, %	19.45±17.86	28.51±21.93	32.44±25.71	<0.001
Late loss, mm	0.45±0.49	0.85±1.72	0.73±0.69	0.008
Cardiac death	2 (2.0)	1 (0.7)	1 (1.5)	0.696
Q-wave MI	0 (0)	0 (0)	0 (0)	1.000
Non-Q-wave MI	0 (0)	0 (0)	0 (0)	1.000
TLR	6 (5.9)	16 (11.6)	9 (13.8)	0.190
TVR	8 (7.8)	22 (15.9)	12 (18.5)	0.092
TVR-MACE	13 (12.7)	25 (18.1)	15 (23.1)	0.218
Stent thrombosis	0 (0)	0 (0)	3 (4.6)	0.004

e0473 | **RAPID RE-ENDOTHELIALIZATION AND ANTI-INTIMAL HYPERPLASIA CORONARY STENT SYSTEM WITH A NOVEL BIOMACROMOLECULAR PROHEALING COATING**

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Background Rapid healing of endothelium on the coronary stent is a crucial method to prevent late stent thrombosis, a rare but life-threatening complication of drug eluting stents (DES). Here we developed a novel biomacromolecular coating for pro-healing DES and investigated their anti-proliferation as well as re-endothelialisation function.
Methods A dual function DES was designed in an asymmetric coating way: a layer-by-layer (LBL) self-assembly polymer of chitosan/heparin (CS/HEP) coated onto aluminal side of stents to accelerate re-endothelialisation and sirolimus onto vessel wall side to inhibit neointimal hyperplasia. Morphological, gene transcript (RT-PCR), endothelial and antithrombotic marker expression analyses were used to evaluate the effects of CS/HEP coating on adhesion, proliferation and differentiation of CD133$^+$ endothelial progenitor cells (EPCs). Finally, the prohealing function as well as impact on coronary stenosis of this stent system were assessed in porcine model.
Results CS/HEP coating can significantly promote the adhesion, proliferation and differentiation of EPCs in vitro. CS/HEP upregulated expression of endothelial marker (ie, PECAM-1 and eNOS) and antithrombotic factor (ie, thrombomodulin). Interestingly, CS/HEP also promoted down-regulation of sirtuin-1, a gene related with endothelial cellular senescence. In porcine model, CS/HEP modified sirolimus eluting stent (CH-SES) showed rapid endothelialization superiority to bare metal stent (BMS) and SES, even in 1 week after stent implantation. Through electron microscopy analysis, the arteries treated with CH-SES were mostly fully endothelialized. As for effects on intimal hyperplasia, by angiography, intravascular ultrasound and histomorphometric analysis, there was no significant difference between CH-SES and SES in intimal thickness from 1 month to 3 and 6 months. Generally, SES took at least 3−4 weeks for the endothelial coverage of the stent struts, while the CH -SES only took 1−2 weeks for endothelial repair and kept antiproliferation function as SES.
Conclusion This natural chitosan/heparin biomacromolecular self-assembly coating was safe and efficient in stent implanted porcine model. The preliminary results hinted possible molecular basis of CS/HEP for rapid endothelial recovery. Meanwhile, coated with heparin, the CS -SES showed potent anti-coagulation function compared to traditional SES. To sum up, CS -SES may represent a promising self-rapid healing DES system to prevent in stent thrombosis as well as restenosis.

e0474 | **EFFECT OF PLAQUE DISTRIBUTION TO BIOMECHANICAL**

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Introduction we presume that the plaque vulnerability of mildly lesions will be related to its intrinsic structural features and biomechanical characteristics. However, very little is known about their relationship between structural features and plaque vulnerability and about effect of biomechanical characteristics and plaque behaviour on vulnerable plaque. It is well known that coronary angiography (CAG) cannot accurately determine lesion morphology because it only shows the silhouette of the contrast materiel passing through the stenotic lesions. In recent years, intravascular ultrasound (IVUS) has evolved as a valuable adjunct to angiography. IVUS allows precise tomographic measurement of lumen area and plaque size, distribution and, to some extent, composition. Therefore, IVUS provide us likelihood for study on structural features and biomechanics characteristics in angiographic mildly stenosis in vivo.
Materials and methods In 42 patients of angiographic intermediate coronary stenosis (diameter stenosis 40%-60%), IVUS imaging was performed and intracoronary pressure was recorded. The patients were classified as either unstable plaques group (n=30) or stable plaques group (n=12) by IVUS image. The biomechanical properties (distensibility index and stiffness) of coronary artery were calculated and the plaque behaviour during cardiac cycle was determined.
Results There was no significant difference in percent area stenosis between eccentric plaque group and concentric plaque group (53.9±8.9% vs 58.4±9.8%, p>0.05). The coronary distensibility index in unstable plaques was significantly greater than it was in stable plaques (2.1±0.3 vs 1.2±0.2 mm Hg-1, p<0.01), but stiffness β for stable plaques was significantly greater than it was for unstable plaques (8.1±1.3 vs 29.4±7.2, p<0.01). The change of plaque area during cardiac cycle (plaque distensibility) in unstable plaque group was greater than it was in stable plaque group (0.52±0.22 mm^2 vs 0.24±0.19 mm^2, p<0.01). Positive remodelling occurred more frequently with unstable plaques than with stable plaques (63% vs 8%, p<0.01).
Conclusion High coronary artery distensibility and high plaque distensibility during the cardiac cycle in eccentric lesions will likely increase plaque vulnerability.