
Rassegna della Letteratura

Therapy-Dependent Influence of Time-to-Treatment Interval on Myocardial Salvage in Patients With Acute Myocardial Infarction Treated With Coronary Artery Stenting or Thrombolysis

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Background The relationship between myocardial salvage and time-to-treatment interval in patients with acute myocardial infarction (AMI) treated with coronary artery stenting or thrombolysis has not been studied.

Methods and Results This study analyzed 264 patients with AMI randomized to coronary stenting (133 patients) or thrombolysis (131 patients) in the setting of 2 randomized trials. Patients were divided into the following 3 groups defined by tertiles of the time-to-treatment interval: lower tertile (<165 minutes), middle tertile (165 to 280 minutes), and upper tertile (>280 minutes). Paired scintigraphic examinations were performed to obtain salvage index, which was the primary end point of the study. In the group with thrombolysis, the salvage index (median [25th; 75th] percentile) was 0.45 (0.16; 0.83) in the lower, 0.29 (0.17; 0.48) in the middle, and 0.20 (0.04; 0.46) in the upper tertile (P=0.03). In the group with stenting, the salvage index was 0.56 (0.49; 0.75) in the lower, 0.57 (0.36; 0.73) in the middle, and 0.57 (0.32; 0.75) in the upper tertile (P=0.59). In patients treated with stenting, the salvage index was greater than in patients treated with thrombolysis in the lower (0.56 versus 0.45, P=0.09), middle (0.57 versus 0.29, P=0.0003), and upper (0.57 versus 0.20, P=0.0005) tertiles of the time-to-treatment interval.

Conclusions The influence of the time-to-treatment interval on the myocardial salvage in patients with AMI depends on the type of reperfusion therapy. Coronary artery stenting was superior to thrombolysis independent of the time-to-treatment intervals, and the difference in benefit increased with more prolonged time from symptom onset.

Impact of Preinterventional Arterial Remodeling on Neointimal Hyperplasia After Implantation of (Non-Polymer-Encapsulated) Paclitaxel-Coated Stents: A Serial Volumetric Intravascular Ultrasound Analysis From the ASian Paclitaxel-Eluting Stent Clinical Trial (ASPECT)

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Background This study used serial volumetric intravascular ultrasound (IVUS) to evaluate the effect of preinterventional arterial remodeling on in-stent intimal hyperplasia (IH) after implantation of non-polymer-encapsulated paclitaxel-coated stents.

Methods and Results Patients were randomized to placebo or one of two doses of paclitaxel (low dose, 1.28 µg/mm²; high dose, 3.10 µg/mm²). Complete preinterventional, post-stent implantation, and follow-up IVUS were available in 18 low-dose and 21 high-dose patients. IH volumes were similar in low-dose and high-dose patients: 17.6±15.1 mm³ in low-dose patients and 13.1±13.3 mm³ in high-dose patients (P=0.3). Therefore, IVUS findings in low- and high-dose patients were combined. Preinterventional remodeling was assessed by comparing lesion site to proximal and distal reference arterial area: positive remodeling (lesion>proximal reference, n=13), intermediate remodeling (distal reference<lesion<proximal reference, n=13), and negative remodeling (lesion<distal reference, n=13). During follow-up, there was a decrease in lumen volume in positive remodeling lesions (from 106±30 to 90±27 mm³; P=0.0067) and in intermediate remodeling lesions (from 97±28 to 76±31 mm³; P=0.0004), but not in negative remodeling lesions (99±27 versus 92±32 mm³; P=0.15). The follow-up IH volume was lower in negative remodeling lesions (5±7 mm³) compared with positive remodeling (20±14 mm³; P=0.0051) and intermediate remodeling lesions (20±15 mm³; P=0.0043); however, IH volume was virtually identical in positive and intermediate remodeling lesions. Multivariate linear regression analysis determined that remodeling and inflation pressure were independent predictors of IH volume; variables tested in the model included diabetes, acute coronary syndromes, dose, remodeling, and preinterventional plaque burden.

Conclusions Preinterventional arterial remodeling, especially negative remodeling, influences neointimal hyperplasia suppression after implantation of non-polymer-encapsulated paclitaxel-coated stents.

Benefits and Risks of Abciximab Use in Primary Angioplasty for Acute Myocardial Infarction: The Controlled Abciximab and Device Investigation to Lower Late Angioplasty Complications (CADILLAC) Trial

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Background Trials of platelet glycoprotein IIb/IIIa inhibitors as adjuncts to primary percutaneous coronary intervention for acute myocardial infarction (MI) have shown improved early clinical and angiographic outcomes with treatment. However, variations in trial designs, modest sample sizes, and limited long-term follow-up have precluded these studies from being definitive.

Methods and Results As a prespecified secondary analysis of the CADILLAC trial, we compared early and late outcomes by abciximab assignment among 2082 patients randomized in an open-label, 2x2 factorial-design trial of primary stenting versus angioplasty and abciximab treatment (n=1052) versus no abciximab treatment (n=1030). Baseline characteristics were balanced between groups. Abciximab treatment was associated with a significant reduction in the composite end point of death, MI, ischemia-driven target-vessel revascularization (TVR), or disabling stroke at 30 days (4.6% versus 7.0%; relative risk, 0.65; 95% CI, 0.46 to 0.93; P=0.01). Subacute thrombosis also was significantly reduced with abciximab treatment. At 12 months, however, rates of the composite end point did not differ significantly (18.4% for controls versus 16.9% for abciximab-treated patients; relative risk, 0.92; 95% CI, 0.76 to 1.10; P=0.29), reflecting a decrease in the relative difference in TVR rates (ie, no effect of abciximab on reducing restenosis). In an angiographic substudy (n=656), myocardial salvage, restenosis, and infarct-artery reocclusion at 7 months were unaffected by abciximab treatment. There was no significant interaction between stenting and abciximab treatment.

Conclusions Adjunctive abciximab treatment during primary percutaneous coronary intervention significantly enhanced 30-day event-free survival, predominantly by reducing ischemia-driven TVR. Abciximab treatment did not affect the composite end point at 1 year, reflecting a lack of effect on restenosis.

Randomized Comparison of Percutaneous Transluminal Coronary Angioplasty and Medical Therapy in Stable Survivors of Acute Myocardial Infarction With Single Vessel Disease: A Study of the Arbeitsgemeinschaft Leitende Kardiologische Krankenhausärzte

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Background Percutaneous transluminal coronary angioplasty of the infarct-related artery in stable survivors of acute myocardial infarction is often performed, even in patients without any symptoms or residual ischemia. Despite the lack of randomized studies, it is widely believed that this intervention will improve the clinical outcome of these patients.

Methods and Results Three hundred patients with single vessel disease of the infarct vessel and no or minor angina pectoris in the subacute phase (1 to 6 weeks) after an acute myocardial infarction were randomized to angioplasty (n=149) or medical therapy (n=151). Primary end point was the survival free of reinfarction, (re)intervention, coronary artery bypass surgery, or readmission for severe angina pectoris at 1 year. The event-free survival at 1 year was 82% in the medical group and 90% in the angioplasty group (P=0.06). This difference was mainly driven by the difference in the need for (re)interventions (20 versus 8, P=0.03). At long-term follow-up (mean, 56 months), survival was 89% and 96% (P=0.02). Survival free of reinfarction, (re)intervention, or coronary artery bypass surgery was 66% and 80% in the medically and interventional treated patients, respectively (P=0.05). The use of nitrates was significantly lower in the angioplasty group, both at 1 year (38% versus 67%, P=0.001) and at long-term follow-up (36% versus 55%, P=0.006).

Conclusions Percutaneous revascularization of the infarct-related coronary artery in stable patients with single vessel disease improves clinical outcome at long-term follow-up and reduces the use of nitrates. The results of our study should be reproduced in a confirmatory study with a larger sample size before percutaneous coronary intervention in this low-risk patient subgroup, after myocardial infarction can be recommended as routine treatment in clinical practice.

Transcatheter Angioplasty for Acquired Pulmonary Vein Stenosis After Radiofrequency Ablation

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Background Pulmonary vein stenosis has recently been recognized as a complication of radiofrequency ablation for atrial fibrillation. This study evaluates the presentation of affected patients and the role of transcatheter therapy for this patient population.

Methods and Results This study used a retrospective review of data from 19 patients (age, 51±13 years) with pulmonary vein stenosis who underwent catheterization and angiography between December 2000 and December 2002. Quantitative perfusion and spiral CT scans were performed for initial diagnosis and follow-up. The median duration between radiofrequency ablation and the reported onset of respiratory symptoms for 18 of 19 patients was 7.5 weeks (0.1 to 48). After the onset of symptoms, all but two patients were initially misdiagnosed with a symptoms-to-diagnosis duration of 16 weeks (2–59). At initial catheterization, 17 of 19 patients had angioplasty in 30 veins with stent placement in 5 vessels when a flap occurred. Overall vessel diameter increased from 2.6±1.6 to 6.6±2.4 mm ($P<0.0001$). There were 4 procedure-related adverse events but no long-term sequelae. Immediate follow-up showed improved flow to involved lung segments. At a median follow-up of 43 weeks (2–92), although repeat angioplasty for restenosis was necessary in 8 of 17 patients, 15 of 17 patients currently have no or minimal persistent symptoms.

Conclusions Pulmonary vein stenosis after radiofrequency ablation for atrial fibrillation is often misdiagnosed. Although further follow-up is necessary to determine long-term success, our data indicate better pulmonary vein flow and symptomatic improvement in the majority of patients undergoing dilation of postablation pulmonary vein stenosis.

Simultaneous Assessment of Fractional and Coronary Flow Reserves in Cardiac Transplant Recipients: Physiologic Investigation for Transplant Arteriopathy (PITA Study)

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Background The utility of measuring fractional flow reserve (FFR) to assess cardiac transplant arteriopathy has not been evaluated. Measuring coronary flow reserve (CFR) as well as FFR could add information about the microcirculation, but until recently, this has required two coronary wires. We evaluated a new method for simultaneously measuring FFR and CFR with a single wire to investigate transplant arteriopathy.

Methods and Results In 53 cases of asymptomatic cardiac transplant recipients without angiographically significant coronary disease, FFR and thermodilution-derived CFR (CFR_{thermo}) were measured simultaneously with the same coronary pressure wire in the left anterior descending artery and compared with volumetric intravascular ultrasound (IVUS) imaging. The average FFR was 0.88±0.07; in 75% of cases, the FFR was less than the normal threshold of 0.94; and in 15% of cases, the FFR was 0.80, the upper boundary of the gray zone of the ischemic threshold. There was a significant inverse correlation between FFR and IVUS-derived measures of plaque burden, including percent plaque volume ($r=0.55$, $P<0.0001$). The average CFR_{thermo} was 2.5±1.2; in 47% of cases, CFR_{thermo} was 2.0. In 14%, the FFR was normal (0.94) and the CFR was abnormal (<2.0), suggesting predominant microcirculatory dysfunction.

Conclusions FFR correlates with IVUS findings and is abnormal in a significant proportion of asymptomatic cardiac transplant patients with normal angiograms. Simultaneous measurement of CFR with the same pressure wire, with the use of a novel coronary thermodilution technique, is feasible and adds information to the physiological evaluation of these patients.