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to PTCA (n=63) or CABG (n=64). The primary end point of this study was to compare freedom from combined coronary cardiac events (death, myocardial infarction repeat revascularization procedures and angina) and late cost between both groups of patients at 1.5 and 5 years follow up. Results: At five years freedom from combined cardiac events was significantly greater in CABG than in PTCA patients (83% vs 69%, p<0.01), with no differences in overall (94.6% vs. 77.4%, p<0.001) survival and in the incidence of non-fatal myocardial infarction (6.4% vs. 11.1%, p<0.05). Both groups were otherwise similar. This study reveals that both long-term survival and non-fatal MI rates are higher in patients treated with CABG than with PTCA. However, there were no differences in mortality, patients treated with PTCA. In contrast to previous studies, however, there was no significant difference in clinical outcome between patients treated with either PTCA or CABG (p>0.3). Conclusion: While CABG was a risk factor for worse long-term outcome in patients with multivessel coronary artery disease, the effect was similar in the PTCA and CABG groups. These results do not support earlier conclusions that diabetes status should determine the choice of revascularization strategy.

The Choice of Repeat PTCA or CABG in Diabetics Who Have Had Previous CABG
William S Weintraub, Ellis L Jonas, Joseph M Craver, Robert A Guyton, Douglas C Morris. Emory University, Atlanta GA USA
Outcome in 1041 diabetics with previous CABG was studied after repeat CABG (n=63) or PTCA (n=68). The PTCA group had more women (26% vs 21%), fewer prior MIs (55% vs 65%), fewer or left main disease (65% vs 81%) and higher EFs (51% vs 49%). The groups were otherwise similar. Hospital Q wave MIs occurred more often after (p<0.001), as did death (7.5% vs. 2.0%), S & 10 year survival was 83% & 87% in PTCA & 88% & 84% p CABG (left figure, p=NS). 5 & 10 year freedom from (FF) MI was 71% & 59% in PTCA & 83% & 60% in CABG (p=0.01), 5 & 10 year FF CABG was 70% & 50% in PTCA & 96% & 79% in CABG (p<0.001), 5.1 year FF PTCA or CABG was 49% & 23%, p PTCA & 91% & 47% in CABG (right figure, p<0.001). Any survival difference between groups could be accounted for by the covariates age (p<0.01), ejection fraction (OR 0.88 per 1% increase), time from prior CAB (OR 1.05 per year), heart failure (OR 1.71), hypertension (OR 1.46) and emergent or urgent procedure (OR 1.43 and 2.08). Characteristics, in-hospital and follow up results and covariates in 284 PTCA & 262 CABG IR patients were similar. This study reveals that both long term survival and non-fatal MI rates are higher in patients treated with PTCA than with CABG. Thus, revascularization choices in diabetics with previous CABG must be made without data to support a survival advantage for either therapy, but rather on clinical, angiographic and patient preference grounds.

The Association Between a History of Diabetes and Outcome in Patients Undergoing Percutaneous Interventions
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To study the relative importance of diabetes compared with other risk factors for adverse outcomes (death, MI, re-PTCA, CABG) after percutaneous intervention, we pooled data from 7 multicenter trials. A total of 6338 pts with 6 to 9 mo clinical and angiographic follow-up were included. Diabetics were older (median age 62 vs 59), less often male (63% vs 78%), smoked less (6% vs 4%), had more hypertension (67% vs 63%), 3 vessel disease (11% vs 16%), prior MI (49% vs 45%), prior PTCA (20% vs 15%), and prior CABG (23% vs 14%). Diabetics and non-diabetics had similar pre-procedure stenosis (69 vs 68%) and TIMI 3 flow (71 vs 75%). Angiographic successes (CCA ≤ 50%) and abrupt closure rates were similar between groups. Diabetics had higher 6 mo restenosis rates (46 vs 44% p=0.04). Outcomes are shown in the table. Multivariable regression revealed that a history of diabetes was associated with higher 9 mo composite outcomes after adjusting for baseline variables (x 2=4.05 p=0.05) but prior MI, pre-procedure stenosis, and a diseased vessels were more predictive (x 2=69 p<0.001). Conclusion: Intermediate outcomes after PCI are best predicted by ≥dues vessels, prior MI, and pre-procedure stenosis. Although diabetes predicts composite outcomes, the effect is mild and mostly due to higher restenosis rates.

Clinical Cardiology:
Coronary Angiography and Diagnostic Imaging
Tuesday Afternoon
Ballroom D2
Abstracts 2548–2557

After Successful Thrombolysis for Acute Myocardial Infarction Culprit Lesion Morphology does Not Predict Early and Long-term Outcome
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In the APRICOT-study we performed coronary angiography in 284 patients (pts) within 48 (mean 24) hours after successful thrombolysis for acute myocardial infarction (AMI). Culpit lesion morphology was scored as complex or smooth. After 3 months a second angiogram was performed
Fusion of Intracoronary Ultrasound and Biplane Angiography Images for Accurate 3D Reconstruction of Coronary Arteries

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3D visualization of coronary morphology using intravascular ultrasound (IVUS) may be evaluated using athroama progression and treatment efficacy. A method for accurate reconstruction of coronary anatomy using IVUS and biplane fluoroscopy has been developed which depicts true arterial curvature and orientation. The IVUS transducer was tracked in time by back-projection of biplane fluoroscopy during unassisted patency in perfused nonatherosclerotic LAD or LCA. The luminal borders from simultaneously acquired IVUS images were placed perpendicular to the transducer path at each point. Retinal orientation was determined by minimizing the mismatch between vessel outlines in angiograms and the reconstruction projected into that plane. The result was stereorendered for visualization or planimetry. Vessel curvature, lumen shape, and branch ostia could be easily visualized. Simulated angiograms were created by projecting 3D reconstructions to 2D planes compared well with actual angiograms, with up to 71% overlap in lumen area, indicating of the accuracy of the 3D representation. This technique does not depend upon automated pullback and curvature determination and, therefore, is not subject to errors caused by lumen angle changes. Measurement of curvature and orientation can be easily visualized. This project will be extended to visualize luminal and adventitial surfaces in atherosclerotic arteries, and gated to visualize the vessel during the full cardiac cycle.

A 3D Coronary Processing Tool to Optimize Visualization Strategy in the Cardiac Catheterization Laboratory

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Due to vessel overlap and foreshortening, multiple projections are necessary to adequately evaluate the coronary tree with arteriography. The traditional trial-and-error method provides views of gantry angulations minimizing the segment's foreshortening is caculated yielding multiple computer-generated projection images. With this technique, the 3D structures and relationships of arteries can be clearly identified which are unable to be achieved by other modalities such as intravascular ultrasound or MRI. To date 3D reconstruction has been performed in 20 RCA, 18 LCA, and 3 bypass grafts. With 3D coronary reconstruction, it is now possible to virtually determine ideal coronary positions. The assessment of lesion length and diameter narrowing can be optimized for both coronary intervention and studies of progression and regression.

Assessment of Coronary Artery morphology by Three-Dimensional Echocardiography

Benhard Kolisch, Susanne Mohr-Kalke, Thomas Mezuel, Stephan Wagner, Beate Kolhsau, Thomas A. Fischer, Uwe Nixdorf, Jargeu Meyer. Johannes Gutenberg- Universität, Mainz Germany

The aim of the study was the quantitative assessment of left main coronary artery (LMCA), left anterior descending coronary artery (LAD) and left circumflex artery (CXA) and left anterior descending coronary artery (LAD) morphology by three-dimensional echocardiography. Results were compared to quantitative angiography. The method three-dimensional data set was acquired using a multiplane transesophageal echocardiography probe (Vingmed CFM 800 and multiplane probe, 5 Mhz) by means of a TomTec 3D workstation, 24 patients were examined (mean age 68 years). Results: In all 24 cases (100%) the accurate coronary tree (55% vs 33%; p < 0.005). Resolution rate of complex lesions was lower at 3 months (23% vs 34%; p < 0.05). Pts with complex morphology had more often multivessel disease (90% vs 57%; p < 0.05). The figures show the 3-year follow up for the combined endpoint of death and recurrent MI, showing no difference in outcome in relation to culpiter lesion morphology. Conclusion: Complex morphology of a culprit coronary lesion early after successful thrombolysis for AMI is not associated with adverse outcome. Possibly related factors are lower reocclusion rate and higher incidence of right coronary involvement.

Side Effects of Ionic Versus Nonionic Contrast Media in Cardiology (CIG-Study): A Multicenter Trial on 2690 Patients

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In behalf of the German Society of Cardiology and Cardiovasc. Res. a study was performed comparing the side effects of ionic (I) and nonionic (N) contrast materials (CM) in elective cardiac catheterization. Methods: The randomized double-blind study enrolled 2690 patients from 8 centers, 1350 received a monomeric ICM (Diatrizoate, Urografin®), 1340 a monomeric NICM (topromlon, Ultravist®). We documented anamnestic data like allergies, height, weight, incidence of adverse reactions, complications and need of therapeutic interventions. The evaluation included logistic regression and calculation of odds ratios for risk factors (SAE). Results: Basic data of the groups were different, both received 121 ml CM. Major results are given in the tables. Odds ratios indicate riskprotective factors for allergic reactions, dyspnoea, angina and bradycardia. Conclusions: Mild and moderate adverse effects were reduced significantly by use of NICM whereas severe reactions requiring major therapeutic interventions and thromboembolic complications occurred very rarely after both CM without significant differences.

Are Quantitative Angiographic Results After Coronary Intervention Affected by the Specific Analysis Algorithm?

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Binary angiographic restenosis rates after balloon angioplasty have varied substantially in new devillists elastic restenosis trials (CAYEVT: 57%; BENESTENT: 35%), possibly due to differences in the angiographic algorithms (QCA) used in these studies. To assess the correlation of these algorithms (Artrek: CMS-non GFT), we performed blinded, identical frame QCA In 629 patients before, after, and late after coronary intervention. Pseose correlation (P Corr) is reported (see Table). Between system differences in pre-MLD were highest in Irregular lesions (0.12 mm versus 0.12 mm in smooth lesions; p < 0.003). Acute gain (Artrek: 1.54 mm, CMS: 1.53 mm) and late loss (Artrek: 0.80 mm, CMS: 0.85 mm) were similar. No differences in restenosis rates (>50% follow-up stenosis) were identified (Artrek: 30% vs CMS: 36%). We conclude that between-system QCA differences 1) are highest for pre-MLD, relating In part, to lesion contour; but 2) do not influence final angiographic results or late restenosis rates using these two systems.

IMA- AND VENY GRAFT PATENCY CONTROL BY ECHOGRAPHIC VERSUS THERMAL CORONARY ANGIOGRAPHY AS COMPARED DURING CORONARY BYPASS SURGERY

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The values of thermal coronary angiography (TCA) and echocardiography (E) for intraoperative assessment of coronary calcification, graft patency and flow in vein- and internal mammary artery