global cohort and CAC 0-1), Group 1 (SS above or equal to the median or CAC 2-3) and Group 2 (SS above or equal to the median and CAC 2-3). After discharge patients were followed in an outpatients basis, recording major events and focusing in AAE. Survival-free of AAE curves were calculated with the Kaplan-Maier method. In order to avoid the potential bias of confusion variables, we used a multivariate proportional hazards Cox model, including all variables with a p<0.2 at univariate analysis. Final results were presented as hazard ratio (HR) for AAE with its 95% confidence interval (95% CI).

**RESULTS** Median follow up was 1.79 years (RIC 0.94-2.86). Median SS was 14 (RIC 7-23).Clinical variables are listed in Table 1. During follow up a total of 27 AAE were recorded. Group 0: 8 events (6.6%), Group 1: 9 events (8.5%), and Group 2: 10 events: (23.8%). The Kaplan-Maier curves are shown in Figure 1. After multivariate Cox analysis, adjusted HR were the following: HR 4.31 (CI95%: [1.69-11.03], p=0.002) (comparison of group 2 vs. group 0); HR 3.28 (CI95%: [1.28-8.38], p=0.013) (group 2 vs. group 1) and HR 1.3 (CI95%: [0.49-3.52], p=0.013)(group 1 vs. group 0).

| Variable | Total population (N=270) | Group 0 (SS<14 and BC 0-1) 122 patients | Group 1 (SS ≥14 or BC 2-3) 106 patients | Group 2 (SS ≥14 and BC 2-3) 42 patients | p value |
|---|---|---|---|---|---|
| Age (yrs) | 65.0 (54.0-76.0) | 62 (51-73) | 66.5 (55-77) | 76.5 (65-81) | 0.001 |
| Men | 66.7% | 60.7% | 76.4% | 59.5% | 0.44 |
| Body mass index (kg/m²) | 27.9 (25.5-30.9) | 28.5 (25.8-31.7) | 27.7 (25.1-30.2) | 27.7 (24.6-30.1) | 0.35 |
| Diabetes mellitus | 20.7% | 15.6% | 22.6% | 31% | 0.028 |
| Smoker (present or former) | 68.9% | 70.5% | 69.8% | 61.9% | 0.37 |
| Hypertension | 70% | 59% | 79.1% | 78.6% | 0.002 |
| LV ejection fraction | 60.0 (50.0-67.0) | 60.0 (52.0-70.0) | 57.0 (46.0-64) | 60% (45-67) | 0.017 |
| Aspirin | 91.1% | 95.9% | 85.8% | 90.5% | 0.025 |
| Clopidogrel | 74.8% | 71.3% | 79.2% | 73.8% | 0.38 |
| Acenocumarol | 5.9% | 7.9% | 6.6% | 7.1% | 0.81 |
| Statins | 93% | 91.8% | 92.5% | 97.6% | 0.35 |
| β-Blockers | 70.7% | 68.9% | 71.7% | 73.8% | 0.80 |
| STEMI | 46.7% | 45.1% | 56.6% | 26.2% | 0.03 |
| Complete revascularization | 70% | 81.1% | 65.1% | 50% | 0.001 |
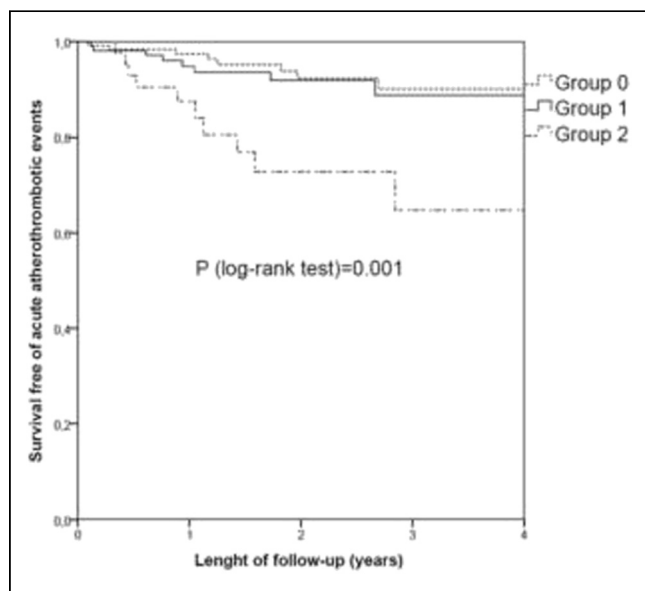


CONCLUSIONS According to our data the combination of SS (≥14) and high CAC (2-3) is a strong predictor of AAE, in patients admitted with an ACS. Further studies are needed to test our results.

CATEGORIES CORONARY: Angiography and QCA

KEYWORDS Coronary artery calcification, Syntax score

TCT-283

**Distal Vessel Quality (DVQ) score as a predictor of short- and mid-term coronary artery bypass graft dysfunction: Towards the optimization of the revascularization strategy**

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BACKGROUND Coronary artery bypass surgery (CABG) is recommended by guidelines in several scenarios. However, the early occlusion of the grafts is not uncommon. Some clinical factors have been described as predictors of this early dysfunction but the impact of the grafted distal vessel on outcomes is poorly understood. We aimed to develop a new simple angiographic score that would predict patency problems of the grafts in short- and mid-term.

METHODS We enrolled 249 consecutive patients. All of them underwent CABG with a mean of 6-year follow-up. "Distal Vessel Quality" (DVQ) score was calculated by assigning a value from 0 to 9 according to the criteria of visibility, diameter and size of the distal vessel angiographically evaluated. Each variable was quantified from 0 (worst) to 3 (best). The mean DVQ score was the result of the cumulative scores for all distal vessels that were grafted divided by the number of vessels. Two independent cardiologists, blind to the outcomes, calculated the DVQ score with low interobserver variability.

RESULTS Mean age was 66.3 ± 9.7 years, 82.7% were males and risk factors included were: high blood pressure (53.4%), diabetes (30.5%) and dyslipidemia (49.8%). Each patient received an average of 2.9 grafts until a total of 741, especially to the anterior descending artery (33%) and obtuse marginal artery (OM) (27%). A total of 453 (61%) venous grafts and 287 (39%) arterial grafts were implanted. At follow-up 16% of the patients were admitted due to STEMI (0.4%), non-STEMI (2%), unstable angina (8.4%) and stable angina (5.2%). Occlusion of 67 grafts was angiographically demonstrated at an average time from surgery of 511 days (IQR, 168-606), particularly affecting those sutured to the OM (37%). The occlusion was more often in men (13 vs 3%, p = 0.03), venous grafts (11.6 vs 7%, p = 0.01) and patients with lower single vessel score (5.78 ± 1.01 vs. 6.47 ± 1.36, p = 0.006) and mean DVQ score (5.86 ± 1.03 vs. 6.32 ± 0.79, p = 0.019). Multivariate analysis showed that the use of arterial grafts (OR = 0.217, 95% CI [0064-0737], p = 0.014) and higher values of DVQ score (OR = 0.555, 95% CI [0370-0832], p = 0.004) were related to longer patency of the grafts.

CONCLUSIONS The DVQ score is a new simple tool to predict outcomes of coronary artery bypass grafts. Lower values of this score suggest little benefit of grafting certain vessels. Therefore, this score could be useful to identify patients who may benefit from percutaneous revascularization or hybrid strategies.

CATEGORIES CORONARY: Hybrid Revascularization

TCT-284

**Comparison of Visual Assessment of Coronary Stenosis with Independent Quantitative Coronary Angiography: Findings from the PROMISE Trial (PROspective Multicenter Imaging Study for Evaluation of chest pain)**

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BACKGROUND The difference in prognostic discrimination between visual assessment of coronary stenosis and quantitative coronary angiography (QCA) for obstructive disease in patients with suspected coronary artery disease (CAD) is not known.

METHODS In the PROMISE trial, 10,003 patients with symptoms suggestive of CAD were randomized to anatomical or functional testing. Site reports detailing visual stenosis were collected for

patients who underwent invasive coronary catheterization. Independent, blinded QCA analysis was performed to determine presence of obstructive disease, defined by ≥50% stenosis in 1 or more coronary vessels. The rate of disagreement was determined and cardiovascular event rates were compared between groups.

**RESULTS** A total of 929 (9.3%) patients had coronary angiograms with corresponding site reports; 593 patients had obstructive disease per site assessment, while 428 had obstructive disease per QCA (Table). The site read and QCA were different in 177 patients (disagreement rate 19.1%, simple κ=0.63) of whom 171 had obstructive disease per site read but not by QCA. One-year event rates were highest (15%) when QCA and site assessment agreed for obstructive disease, lowest (2.4%) when QCA and site agreed for no obstructive disease, and intermediate (7.1%) when disagreement existed between QCA and site reads (Figure).

| | CAD > 50% | | | 1 Year K-M Event Rate | | |
|---|---|---|---|---|---|---|
| | QCA + | QCA - | TOTALS | QCA + | QCA - | TOTALS |
| Site + | 422 | 171 | 593 | 15.0% | 7.1% | 13.2% |
| Site - | 6 | 330 | 336 | NA* | 2.4% | 2.4% |
| TOTALS | 428 | 501 | 929 | 14.8% | 4.7% | 8.3% |

*Given the low number of patients with Site – and QCA + (6), no Kaplan-Meier rates were reported or graphed.
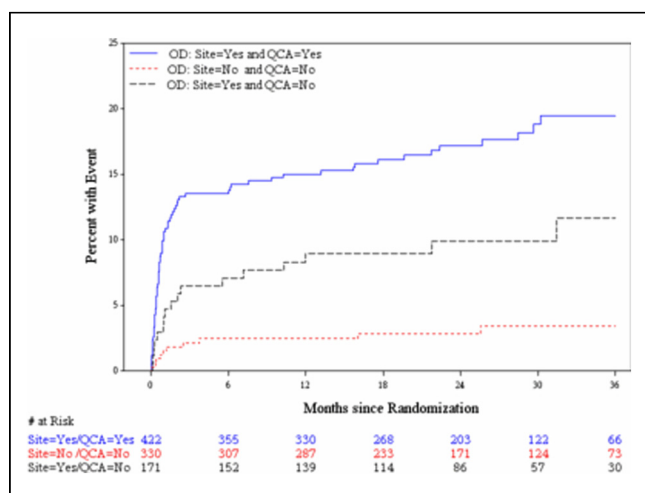


**CONCLUSIONS** Routine visual estimation of angiograms overestimates obstructive disease compared to QCA. Site and QCA agreement on CAD >50% or <50% was associated with high and low event rates, respectively; disagreement was associated with intermediate rates. These findings suggest that opportunities exist to improve the assessment of coronary angiography.

**CATEGORIES CORONARY:** Angiography and QCA

**KEYWORDS** Angiography, Coronary artery disease, Quantitative coronary angiography

**TCT-285**

**Radiation dose reduction in the cardiac catheterization laboratory utilising a novel protocol**

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**BACKGROUND** The cardiac catheterization laboratory is an important source of radiation. A reduction in radiation doses as low as possible,

maintaining the quality of procedures is essential. Our aim was to analyze the results of a novel radiation reduction protocol (RRP) system for coronary angiography and interventional procedures and the determinants of radiation dose.

**METHODS** 1130 consecutive procedures from a single catheterization laboratory [diagnostic coronary angiographies (CA) and percutaneous coronary interventions (PCI)] were analyzed. 539 were performed before RRP and 591 after it. RRP implementation consisted in reducing the number of ventriculographies and aortographies for cases with a clear indication, reducing number of cine runs, and using as much as possible low resolution fluoroscopy and last fluoroscopy hold (a software program that enables dynamic storage of last fluoroscopy sequences).

**RESULTS** 69.4% were male with a mean age of 66.8 ± 12.6 years. There were no significant differences in clinical baseline features nor in the percentage of PCIs performed during the 2 periods (54.9% vs 52.6%; p=0.5). They had a similar complexity: syntax score (18.1 ± 12.2 vs 18.8 ± 14; p=0.7); acute coronary syndromes (45.8% vs 44.4%; p=0.7); bifurcations (26.4% vs 29.8%; p=0.13)] apart from a higher proportion of total chronic occlusions performed after the RRP implementation (8.6% vs 13.3%;p= 0.01). The angiographic success was similar in both periods (98.3% vs 99.2%; p= 0.6). After the implementation of RRP, there were no significant differences in median fluoroscopy time (12.7 vs 13.6 min; p=0.1) and duration of procedures (25.5 vs 30.4 min; p=0.14). A significant reduction of the percentage of procedures with ventriculography (83.6% vs 12.3%; p<0.0001) or aortography (17.7% vs 6.1%; p<0.0001) was observed, as well as a significant reduction in cine runs (21.1 vs 7.1; p<0.0001) and dose-area product (DAP) (156 vs 71 Gyxcm2; p<0.0001).

**CONCLUSIONS** With the implementation of a RRP, a highly significant 54.5% reduction of DAP was observed without a reduction in the quality or the complexity of procedures. A RRP should be strongly considered among interventional cardiology practice.

**CATEGORIES CORONARY:** Complications

**TCT-286**

**Strategy to reduce radiation dose in cardiac catheterization laboratory-a phantom based study**

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**BACKGROUND** Utilizing lower frame rates (fluoroscopy) is generally considered to reduce the radiation to the patient. However, there is little data on the impact of using lower pulse rate (cine) on total radiation dose. In a phantom-model study, we sought to assess the impact of lower frame/pulse rate and change in intensifier angulation on radiation dose to the patient.

**METHODS** A commercially available adult thoracic anthropomorphic phantom (Lungman®, Kyoto Kakagu, Kyoto, Japan) was used to determine the dose to various organs as shown in Figure 1. Standard angulations (6 views with 300 and 6 views with 40 0) using cine acquisitions (10 seconds for each acquisition) and similarly fluoroscopy using 30 0 angulations (20 seconds for each run) were chosen to expose the phantom. A sheet (12" x 8") of radiochromic dosimetry film (Gafchromic® XR-QA) was used to determine the position of maximum skin exposure. Strips (1" x 2") of radiochromic films attached to phantom at positions 1 to 6 (Figure 1). The radiochromic strips were changed after every complete cine or fluoroscopy run (with 6 acquisitions in each run). Dose was estimated from the radiochromic strips using dose/intensity calibration curves. Dose-Area product was measured from the X-ray equipment system (using an in-built ionization chamber placed in the X-ray tube assembly) for all patients.