TCT-90

The Clinical SYNTAX score has an additive predictive value in high risk patients

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Background: The SYNTAX score (SS) has been used as an angiographic grading tool to determine the complexity of coronary diseases, and was verified to predict outcomes after revascularization. However, the SS neglected clinical factors, which brought up an alternative, the clinical SS (cSS). Many studies compared the predictivity of SS and cSS, yet due to inconsistent results, the superiority of SS or cSS still remains as an issue. In this study, we investigated the predictivity of SS and cSS in various clinical situations.
Methods: Patients were enrolled from the Efficacy of Xience/Promus versus Cypher in rEducing Late Loss after stENTing (EXCELLENT) registry. SS and cSS were checked at an independent angiographic core lab. The primary clinical outcome was 3-year patient-oriented composite endpoint (POCE; a composite of all cause death, any myocardial infarction, and any revascularization).
Results: We calculated SS and cSS for the 5,102 patients from the EXCELLENT registry. When patients had a risk factor such as old age, hypertension, diabetes, current smoking, low ejection fraction, renal insufficiency and no use of statin, the cSS was superior to SS, whereas in patients without risk factors, there was no additive value of the cSS. Patients were divided into 3 groups, according to the number of risk factors present. As a result, 37.1% were in the low risk group (0-2 risk factors), 30.8% were in the intermediate risk group (3 risk factors) and 27.1% were in the high risk group (4-7 risk factors). POCE increased according to risk group; 10.4%, 13.4%, 18.9%, p< 0.001 in the low, intermediate, high risk group respectively. Also by receiver operating characteristic analysis, predictivity of SS was superior to cSS in the low risk group whereas in the intermediate and high risk group, cSS was superior (low risk group: 0.631 vs. 0.637, intermediate risk group: 0.598 vs. 0.632, high risk group: 0.600 vs. 0.644, for SS and cSS).
Conclusions: SS is superior to cSS in low risk patients, whereas in high risk patients, the cSS has better predictivity. The presence of classical risk factors should be considered when using the SS as a predictive tool after revascularization.

TCT-91

Impact of Untreated Coronary Artery Disease After Percutaneous Coronary Intervention in Patients With Prior CABG: The Residual CABG SYNTAX score

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Background: Incomplete revascularization (IR) is associated with adverse short and long-term clinical outcomes after percutaneous coronary intervention (PCI). Recently the residual SYNTAX Score was reported as an objective measure of the degree and complexity of residual stenosis after PCI. Limited information exists regarding IR in patients with previous CABG undergoing PCI, and formal quantification of residual atherosclerosis after PCI in those patients has not been performed. Our objective was to quantify the extent and complexity of residual coronary stenoses following PCI in patients with previous CABG and to evaluate its impact upon mortality.
Methods: Between 1/2012 and 1/2014, 94 patients with previous CABG underwent PCI in our center. The baseline CABG SYNTAX score (basal CSS) and the CABG SYNTAX score after PCI (residual CSS) were assessed. Patients with residual CSS >0 were defined as having IR and were stratified by residual CSS tertiles. The primary endpoint was all-cause mortality at a median follow-up of 22.5 months (IQR range: 15.8-42.7 months).
Results: The basal CSS was 25.7±10.6, and after PCI the residual CSS was 16.9±10.3 (p< 0.01). Complete revascularization was achieved only in 3 patients (3.2%). Among patients with IR (n=91), by tertile grouping 29 patients (32%) had residual CSS >0-12 (mean 7.6±3.2), 31 (34%) had residual CSS >12-20.5 (mean 15.7±2.5) and 31 patients (34%) had residual CSS >20.5 (mean 28.6±7.4). There were no differences in baseline characteristics and clinical presentation between groups. Basal CSS (18.4±7.2, 23.3±6.1 and 36.5±7.7; p< 0.01) and mean graft age (7.4±6.7, 9.1±5.5 and 12.5±8.3 years; p=0.02) were higher in those patients with high residual CSS. Thirty-day mortality was higher in the high residual CSS group (3.4% vs. 6.5% vs. 25.8%, p=0.02). Kaplan-Meier analysis revealed that patients with high residual CSS score had significantly higher all-cause mortality rates (6.9% vs. 16.1% vs. 35.5%, log rank=0.014) during follow up.
Conclusions: The residual CSS is useful to quantify the degree and complexity of residual coronary artery disease after PCI in patients with previous CABG and may aid in determining a reasonable level of revascularization post PCI.

TCT-92

Discordance Between Myocardial Blush Grade And ST-Segment Resolution In STEMI After Primary PCI: Does The Residual Intrastent Thrombus Play A Role?

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Background: ST-segment resolution (STR) and myocardial blush grade (MBG) after primary percutaneous coronary intervention (PCI) provide discordant measures of reperfusion with independent prognostic significance. Aim of the study was to evaluate with frequency domain OCT (FD-OCT) the amount of residual intrastent thrombus, and relate it with STR and MBG.
Methods: One hundred twenty consecutive patients were studied and classified on the basis of STR (≤ 50% or > 50%) and MBG (0/1 or 2/3). Based on discordance or concordance between STR and MBG after PCI, four groups were identified: group 1(6 patients): STR ≤ 50% and MBG 0/1; group 2 (5 patients): STR > 50% and MBG 0/1; group 3 (87 patients): STR> 50% and MBG 2/3; group 4(22 patients): STR ≤ 50% and MBG 2/3. Residual intrastent thrombus was calculated, with OCT, as stent area minus lumen area; mean value of thrombus area (m-ThA,mmq) and % of thrombus area (%ThA: thrombus area / stent area x 100) were also calculated. Killip class, and left ventricular ejection fraction (LVEF) by echocardiography at discharge were available in every patients. Clinical follow-up was completed for all at 1,3,6,12 months by phone interview.
Results: MBG 2/3 was achived in 91% (109/120) of the patients and STR > 50% in 77% of the patients (92/120). STR and MBG were discordant in 23% (27/120) and concordant in 77% (93/120) of the patients. All but 6 patients underwent successful OCT analysis. Overall mean value of m-ThA and %ThA were respectively 0.38±0.45 and 4.7±3.7. Group 2 and group 4 (with STR and MBG discordance) respectively showed significative difference regarding the m-ThA (0.6±0.3 vs 0.3±0.2; p=0.008), % ThA (7.0±3.3 vs 3.7±1.5; p= 0.004), LVEF at discharge (0.35±0.15 vs 0.51±+0.8; p=0.008), Killip class (2.2 vs 1.0; p=0.002), and MACE (2/5 vs 0/22; p=0.03).
Conclusions: Residual intrastent thrombus after stenting for primary PCI can play a role differentiating patients with discordance between STR and MBG. MBG 2/3 and STR ≤ 50% is associated with lower residual thrombus, better LVEF and MACE than MBG 0/1 and STR>50%, so that MBG has more impact on prognosis than STR.

TCT-93

Super short scan C-arm tomography and segmentation for guidance of cardiac interventions

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Background: Automatic 3D segmentation from rotational angiography is used for guidance during atrial fibrillation (AFIB) and transcatheter aortic valve replacement (TAVR) procedures. The workflow can be improved by avoiding high oblique angulations and hence the risk of a detector collision with the patient or equipment. We investigate the impact of 3D reconstruction artifacts from reduced range C-arm tomography on the accuracy of the segmentation and its utility for guidance.
Methods: First, 57 consecutive rotational angiographies covering 200° angular range of the left atrium (LA) and pulmonary veins (PV) acquired for AFIB treatment guidance were reconstructed with varying ranges down to 110° by omitting projections. Second, 20 consecutive XperCT's of the aortic root acquired with hyperpacing for TAVR guidance and an angular range of 180° (8) or 160° (12) were reconstructed with ranges down to 110°. In both setups, for each range a dedicated segmentation model was trained, while expert annotations were available as ground truth.
Results: For AFIB, the mean segmentation error for the LA+PV model only slightly increases from 1.5mm for 200° to 2.0mm for 150° in matched training conditions (see Fig.A). For TAVR, the median error for the valve plane angle compared to those from full angular range stays below 2° down to about 140° (see Box-Whisker-Plot in Fig.B).