Delta (SA minus DARCA) is shown as median (25-75% interquartiles), Correlation (SA vs. DARCA). SA vs. DARCA (L, VS and DS) all p<NS. 0.81 vs. 0.92 (L, VS, DS, delta) all p<NS.

Conclusion: 1) Irrespective of observer expertise, DARCA readings were close to SA, suggesting an optimal diagnostic performance and short learning curve. 2) DARCA appears safer than SA.

TCT-612
Feasibility of Myocardial Perfusion Assesment by the Novel C-Arm CT Angiography
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Background: The amount of perfusion defects is a crucial parameter both for the prognosis of the patient as well as the treatment planning. Usually myocardial perfusion is assessed by SPECT, cardiac MRI or most recently with conventional MSCT using dedicated scanning protocols. During rotational angiography it is now possible to acquire 3D datasets of the cardiac structures by applying dedicated reconstruction algorithms (=C-Arm CT[CACT]). The aim of our study was to prove the feasibility of CACT to detect myocardial perfusion defects and to compare it to cardiac MRI as standard of reference.

Methods: We prospectively included 34 patients with a history myocardial infarction and wall motion abnormalities by echocardiography who were scheduled for cardiac catheterization. Eligible patients received cardiac MRI and CACT within 4 weeks. For CACT aprox. 15ml contrast dye was manually injected over 7 seconds in the ostium of the left or right coronary artery via conventional Judkins coronary catheters. The CACT was done during the myocardial phase of the contrast transit. The resulting dataset was reconstructed and analyzed using short axis and long axis maximum intensity projections (MIP) with 5mm slice thickness by two observers blinded to the results of the other studies. The presence or absence of perfusion defects was noted using a standardized assessment scheme with MRI serving as the standard of reference.

Results: The CACT was successfully performed in 31 of 34 (91%) patients. Altogether 212 segments were analyzable by CACT and MRI. Perfusion defects were visible 71/212 (33%) by CACT and 72/212 (34%) by MRI. Sensitivity, specificity and NPV were 67%, 84% and 83%.

Conclusion: These initial findings of this study demonstrated that assessment of myocardial perfusion with CACT is feasible and rendered reasonable values for specificity and NPV. However, compared with the standard of reference MRI sensitivity especially for subendocardial perfusion defects needs to be improved by further optimization of injection- and scanning protocols.

TCT-613
Histologic features of Advanced Coronary Plaques predict the delineation of the Napkin Ring Sign in coronary CT angiography
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Background: A plaque with a low attenuation core and a high attenuation rim has been termed napkin ring sign (NRS) in coronary CT angiography (CTA). This sign been termed napkin ring sign (NRS) in coronary CT angiography (CTA). This sign has been shown to be a highly specific yet poorly sensitive marker of advanced atherosclerotic lesions. The present study sought to identify characteristics of advanced atherosclerotic lesions in histology that predict the delineation of the NRS in CTA.

Methods: We scanned 7 human donor hearts using a high resolution CT system (Lightspeed Discovery 750HD, GE Healthcare, Milwaukee) and a coronary CTA protocol. Histological slicing and stainings (H&E and Movat Pentachrome) were performed in 1.5 mm increments of each major coronary artery. CT-data was co-registered with Histology. Lesions were classified according to the modified AHA classification.

Results: A total of 611 cross sections were co-registered. Advanced plaques (types IV to VI) were present in 139 (23%) cross sections of which 33 (24%) demonstrated NRS in CTA. NRS was more frequent in late fibrinolysis (61% NRS vs. 38% non-NRS, p<0.05) and associated with greater fibrous/calcified plaque area (median 10.2 vs. 6.4 mm2, p<0.01) and larger vessel area (median 17.1 vs. 13.0 mm2, p<0.01). The area of the necrotic/lipid core tended to be larger in plaques with NRS (median 1.1 vs. 0.5 mm2, p<0.05). Angiogenesis (48% vs. 30%) and absence of micro-calcifications (27% vs. 46%) were more frequent in NRS (p<0.01 and 0.07 respectively). In a multivariate analysis, necrotic/lipid core area (OR=2.1), fibrous/calcified plaque area (OR=1.7), and total vessel area (OR=0.9) were independent predictors of NRS delineation (all p<0.007). These three characteristics explained 80% of the variability of NRS appearance (c-statistic=0.80).

Conclusion: Delineation of NRS in advanced coronary plaques using CTA is independently linked to the size of the necrotic/lipid core and the fibrous/calcified plaque area as well as to the vessel area as measured in histology. This NRS possibly represents a CT equivalent of plaque-characteristics linked to potentially vulnerable plaques in histology and IVUS.

TCT-614
Prognostic Role of coronary artery plaques in patients with suspected coronary artery Disease using multislice Computed Tomography (PREDICT)
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Background: Atherosclerotic cardiovascular disease remains a leading global cause of death and disability. We sought to determine the prognostic value of coronary CT angiography by quantifying of coronary atherosclerosis.

Methods: Outcomes were compared between patients with and without evidence of atherosclerosis (coronary artery plaque) detected by 64-slice MDCT. The primary endpoint was rate of major adverse cardiac events (MACE), a composite of cardiac death, non-fatal myocardial infarction, and coronary artery revascularization during the follow-up period. Secondary endpoint was a composite of all-cause mortality or cardiac hospitalization. Additional assessments included risk trend analysis based on coronary CTA variables. This study is registered with ClinicalTrials.gov number, NCT01142973.

Results: A total of 463 MACE occurred in the overall population during follow-up (median: 404 days), yielding an overall event rate of 7.7% after coronary CTA. A total of 22 patients (0.8%) in the plaque (+) group experienced MACE, as compared with 469 patients (12.6%) in the plaque (-) group (p=0.001). During follow-up, significantly more non-fatal myocardial infarction occurred in plaque (+) group (HR 8.2; 95% CI, 1.1-63.1 p=0.016). However, there was no significant difference in rates of cardiovascular death (HR 1.4; 95% CI, 0.6-3.4 p=0.465) between plaque (-) and (+) groups. According to plaque burden score, MACE rate was 21 (0.8%), 77 (6.2%), 68 (12.4%), 118 (11.3%), and 179 (30.1%) for PBS of 0, 1, 2, 3, and > 4, respectively.

Conclusion: This study show, in patients with suspected CAD, (1) absence of coronary artery atherosclerosis confers excellent prognosis with an event rate <1% (HR: 1.96; 95% CI: 1.27-3.02); (2) plaque burden score (PBS) is an independent predictor (HR: 1.09; 95% CI: 1.02-1.17) with incremental value for MACE, all-cause mortality, and cardiac hospitalization; and (3) a simple measure of PBS is a predictor of MACE, all-cause mortality, and cardiac hospitalization and has incremental value.

TCT-615
The New 320-row Computed Tomography With Lower Radiation Exposure to Rule-out Coronary Artery Disease in Patients with Atrial Fibrillation
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Background: Multi-detector computed tomography (MDCT) is increasingly used to rule out coronary artery disease. In case of atrial fibrillation, however, MDCT has a low predictive value and is not indicated. The new 320-row MDCT allows 3-D volumetric wholeheart imaging during the diastolic of one R-R interval and can widen the use of the technique. Accordingly, aim of this study was to verify the accuracy of 320-row MDCT to rule out coronary artery disease in patients with atrial fibrillation.

Methods: We evaluated 27 patients with permanent atrial fibrillation (age 63±12 years) who underwent 320-row MDCT and invasive coronary angiography for suspected coronary artery disease. Protocol of MDCT (Aquilion One, Toshiba Medical Systems Inc., Tokyo, Japan) included contrast opacification (80 ml iopamidol, 370 mg I/ml followed by 80 ml saline), settings at 100 kV and 320 mA, single heartbeat, prospective ECG-gating, 60±100% phase window, 16 cm cranio-caudal coverage.

Results: MDCT showed no significant coronary artery disease in 21 patients and significant coronary artery stenoses in 6 patients. Coronary angiography confirmed results of the 320-slice MDCT in all patients with a positive predictive value of 100% (per-patient analysis). When analysis was extended to all stenoses>50%, sensitivity was 100% (8 of 8) and specificity was 98% (74 of 75 coronary arteries). The total exposure associated with MDCT was 3.6±0.9 mSv (range: 2.5-5.5 mSv).

Conclusion: The new 320-row MDCT provides optimal diagnostic accuracy across all coronary segments regardless of cardiac rhythm, and allows a consistent decrease in radiation dose. These data indicate that 320-row MDCT with lower radiation exposure is a reliable diagnostic tool in patients with atrial fibrillation.