

e0700 THE DIAGNOSTIC VALUE OF DUAL-SOURCE CT IN PATIENTS SUSPECTED OF CORONARY ARTERY DISEASE: A META-ANALYSIS

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Objective To conduct a meta-analysis-based evaluation of dual-source CT (DSCT) in the diagnosis of coronary artery disease (CAD).

Methods English literatures were searched in Medline. A study was identified if it: (1) used DSCT angiography as a diagnostic test for detection of significant coronary stenosis ($\geq 50\%$ diameter stenosis) in patients with suspected CAD, and (2) used coronary angiography as the reference standard. Sensitivity, specificity with 95% CI on the patient basis was pooled by bivariate random-effects model. Hierarchical weighted symmetric summary receiver-operating curve was also estimated. Likelihood ratios were calculated on the basis of the pooled estimates of sensitivity and specificity. By means of Bayes' theorem integrated with pooled likelihood ratios, the clinical utility of the results was estimated.

Results 10 studies included 1271 patients were identified. Mean rate of nonevaluable patient and segment was 5.6% (33/590) and 2.3% (271/11745) respectively. The pooled results were as follows: sensitivity of 99% (97%–99%), specificity of 86% (79%–90%), positive likelihood ratio of 6.84, and negative likelihood ratio of 0.01. Given a pre-test probability below 84%, the likelihood of disease was less than 5% based on a negative DSCT. If a pre-test probability was above 13%, the likelihood of disease was more than 50% on a positive DSCT.

Conclusions DSCT angiography has good diagnostic performance in the detection of CAD, however, it could not replace conventional coronary angiography totally.

e0701 COMPARISON OF FREE-BREATHING 3D AND CONVENTIONAL 2D LATE GADOLINIUM ENHANCEMENT CARDIAC MR FOR THE EVALUATION OF LEFT VENTRICULAR INFARCTION

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Purpose To compare a new free-breathing 3D late gadolinium enhancement (LGE) cardiovascular magnetic resonance with conventional 2D LGE in patients with prior myocardial infarction.

Methods Patients with prior myocardial infarction were studied using a segmented 2D Phase-Sensitive Inversion-Recovery (PSIR) turbo FLASH sequence followed by a navigator-gated 3D PSIR turbo FLASH sequence on a 1.5T MR scanner for myocardial late enhancement after the administration of gadopentetate dimeglumine. All images were evaluated by two independent cardiovascular radiologists. Overall image quality was graded. The hyperenhanced myocardial scars were compared quantitatively in volume and scored qualitatively on the basis of size (area) and location.

Results 24 patients were successfully scanned using both approaches. Image quality was considered diagnostic for analysis in 23 cases, and this group underwent qualitative and quantitative scar analyses. 2D and 3D results were found to be highly correlated for hyperenhanced scar area and scar location. There was a high correlation between the hyperenhanced lesions volumes determined by 2D PSIR and 3D PSIR ($R^2=0.86$). The average hyperenhancement lesion score (maximum possible score, 68) between both readers

based on scar area per patient was 31.85 (range, 8.5–48) for 3D PSIR and 26.91 (range, 8.5–44.5) for 2D PSIR ($p<0.01$). The average hyperenhancement lesion score based on scar location (maximum possible score, 34) per patient was 19.46 (range, 3.5–28.5) for 3D PSIR and 16.89 (range, 4.5–26) for 2D PSIR ($p<0.01$). The mean scar volume over all cases was 31.41 ml (range, 8.6–63.8) for 3D PSIR and 23.42 ml (range, 7.4–44.6) for 2D PSIR ($p<0.01$).

Conclusion Free-breathing 3D PSIR turbo FLASH provides a promising approach for accurate scar quantification and detection of left ventricular myocardial scar particularly for patients who cannot perform repeated breath-holding.

e0702 PREVALENCE OF ANOMALOUS CORONARY ARTERIES

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Objective Coronary arteries with an anomalous origin and course may occasionally cause sudden death. This is the first study of the prevalence of anomalous coronary arteries in an Asian population.

Methods Over a 4 year period, consecutive patients who were referred to our centre for coronary CT angiogram were prospectively assessed for the prevalence of anomalous coronary arteries.

Results Over the 4 year period, a total of 4500 were assessed. The prevalence of coronary artery anomalies is 0.78%. Coronary arteries can be considered anomalous as a result of single coronary artery or anomalous origin of coronary arteries. There were six of 4500 who had single coronary arteries of which five had absent right coronary artery (RCA) and one had absent left main coronary artery (LMCA). There were 29 patients who had anomalous origin of coronary arteries: four had anomalous left circumflex artery origin, 20 had anomalous RCA origin, four had origin of LMCA or LAD from RCA and one had origin of LMCA from the right coronary sinus. Hence, the commonest anomaly was anomalous origin of RCA.

Conclusion The incidence of anomalous coronary arteries was 0.78% and the commonest coronary anomaly was anomalous origin of RCA.

e0703 RADIATION DOSAGE COMPARISON BETWEEN DIFFERENT CORONARY CT ANGIOGRAPHY PROTOCOLS

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Objective Prospective ECG gated coronary CT angiography (pECG-CCTA) has become an alternative CT protocol. It limits radiation exposure at a narrowed predefined end diastolic time segment instead of during the entire phase of the cardiac cycle, as compared with the retrospective ECG gated coronary CT angiography (rECG-CCTA). In this study, we determined the difference in radiation dose between pECG-CCTA and rECG-CCTA.

Methods Consecutive patients who underwent CCTA were selected for our study; 29 patients underwent pECG-CCTA and 29 patients underwent rECG-CCTA. Inclusion criteria were Body mass index (BMI) of ≤ 30 , sinus rhythm, $HR \leq 70$ bpm. Exclusion criteria were $BMI \geq 30$, irregular rhythm, $HR > 70$ bpm. All the patients were given β -adrenergic blockers and bromazepam to obtain heart rate of ≤ 70 bpm. Patients were given 50 ml of IV Iopamiro 370 at 4.0–5.0 ml/s and 50 ml saline at 4.0–5.0 ml/s. The tube voltage was constant at 100 Kvp and effective tube current was adapted according to the individual patient's body mass index. Effective radiation dose was calculated for both groups.

Results The mean effective radiation dose for the normal BMI group using pECG-CCTA and rECG-CCTA protocols were 1.7 ± 0.2 mSv and 2.9 ± 0.9 mSv respectively. Similarly for overweight BMI group

using pECG-CCTA and rECG-CCTA protocols were 1.7 ± 0.1 mSv and 3.8 ± 1.7 mSv respectively. (See table 1) None of the studies had coronary images which prevented an accurate assessment of the coronary segments.

Table 1 Comparison of effective radiation dose between pECG-CCTA and rECG-CCTA

Sample population	Effective radiation dose (mSv)		
	Mean dose reduction (%)	BMI pECG-CCTA rECG-CCTA	
Normal weight (18.5–<25)	1.7 ± 0.2 (range, 1.3–2.2 mSv)	2.9 ± 0.9 (range, 1.5–4.8 mSv)	41.4
Over weight (25–<30)	1.7 ± 0.1 (range, 1.6–1.7 mSv)	3.8 ± 1.7 (range, 1.9–5.9 mSv)	65.3

Conclusions Using a pECG-CCTA protocol as compared to a rECG-CCTA protocol, there was 41.4% and 65.3% mean radiation dose reduction for the normal and overweight BMI groups respectively.

Related Subjects: Vascular Medicine

e0704 THE STUDY OF EFFECT OF ANGIOTENSIN II ON THE BIOLOGICAL BEHAVIOUR OF RAT VASCULAR SMOOTH MUSCLE CELLS IN VITRO

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Objective To study the effect of Angiotensin II on the proliferation, migration and apoptosis of vascular smooth muscle cell (VSMC) in rats.

Methods The recombinant adenoviral vector, AdCMV-AT2R, containing rat AT2 receptor gene was constructed by homologous recombination, and then it was used to transfer AT2 receptor gene to rat VSMC in vitro. The expression of AT2R mRNA was detected by RT-PCR and the rate of expression in VSMC was determined by flow cytometer. Cell proliferation was determined by incorporation of bromodeoxyuridine (BrdU). The modified Boyden's chamber method was used to test the migration of VSMC. Apoptosis was quantified by flow cytometer.

Results RT-PCR showed that the expression of AT2R mRNA increased obviously in transfected VSMC, and the peak value of expression rate was about 89.51% at 48 h. When the expression of AT2R was at peak value, the OD value of BrdU incorporation were reduced by 51.6% ($p < 0.01$), and the number of VSMC migration was also decreased by 62.2% ($p < 0.05$). The ratio of apoptosis in VSMC was increased from $7.6 \pm 1.6\%$ in control group to $32.1 \pm 5.5\%$ in treated group.

Conclusion The results indicated that the expression of AT2R can inhibit the proliferation and migration of rat VSMC and induce its apoptosis.

e0705 COMPARATIVE STUDY OF CARDIO-ANKLE VASCULAR INDEX (CAVI) AND CAROTID INTIMA-MEDIA THICKNESS

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Objective To contrast measurements by two methods of cardio ankle vascular index (CAVI) and carotid intima-media thickness

(IMT) and discuss the differences and correlation of two methods for clinical application correctly.

Methods The objects are 67 patients with carotid artery ultrasound. We collected the subjects' case history and used VaSera VS-1000 detector to measure CAVI. $CAVI \geq 9.0$ is taken as positive, carotid $IMT > 1.0$ mm was positive standards.

Results There are 38 cases with CAVI positive results in all the 67 patients, the positive rate of 56.72%. Carotid IMT was detected in 48 cases positive (accounting for 71.64%). compared CAVI and carotid IMT with χ^2 test, the results showed that $p > 0.05$, that is to say the measurements of two methods showed no significant statistical difference. In this data we also respectively observed the influential factors of CAVI and carotid IMT using Logistic multiple regression analysis. The result showed that the main influential factor of CAVI and carotid IMT results was age, while none of clinical diagnosis was enrolled the regression equation.

Conclusions In this data carotid IMT was made as ultrasound index and CAVI was made as the index of pulse wave velocity, we observed two methods validity to early assess atherosclerosis, the results showed that the detection rate of two methods was overall no significant difference, while carotid IMT has a higher trend than CAVI in positive rate to diagnose atherosclerosis. There are difference and correlation between CAVI and IMT. IMT reflects structural changes in arteries, and CAVI are mainly arterial function index, reflecting changes in arterial stiffness. IMT is mainly used to assess specific certain vascular structural changes, CAVI is mainly used to evaluate systemic arterial stiffness. So uniting CAVI and ultrasonic testing could be evaluated vascular morphology and flexibility function simultaneously, which can more fully grasp the extent of vascular lesion. In the influential factors, age is an independent influential factor of the two methods. While hypertension, hyperlipidaemia, and diabetes were not included in regression equation, we considered it might be correlated with the time of clinical diagnosis, smoking and other factors, or may be due to small sample of this study, which need clinical further large sample in-depth study to confirm.

Other: Other

e0706 EVALUATION OF INTRAVENTRICULAR FLOW IN DCM PATIENTS USING VECTOR FLOW MAPPING

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Aims To assess the change of intraventricular flow due to DCM (Dilated Cardiomyopathy) using VFM (Vector Flow Mapping).

Methods DCM patients and healthy candidates were included into two groups. 3C and 5C images were stored using VFM. Vector velocity of intraventricular flow was measured at the different planes and compared among groups.

Results Six DCM patients and 11 candidates were included. The vector velocity measured at LV outflow tract is lower in DCM group; a flow in direction of LV apex was found in the middle and apical planes of DCM patients while not in healthy candidates; the vector velocity of isovolumic contraction measured at basal plane is found to be higher in healthy group, but lower in the same group at middle and apical planes.

Conclusions In DCM patients, the vector velocity of LVOT is lower, which is accompanied by an abnormal flow distribution in middle and apical parts of left ventricle in both systole and isovolumic contraction. VFM can be used to evaluate the change of the intraventricular blood flow.