GW25-e4351
Noninvasive evaluation of carotid IMT and elasticity in individuals with cardiovascular risk factors by ultrasound radiofrequency-data technique
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Objectives: Carotid intima-media thickness (IMT) and elasticity have been shown to be independent predictors of cardiovascular disease (CVD). Conventional cardiovascular risk factors (CVRFs) include hypertension, dyslipidemia, diabetes, overweight and smoking. This objective was to investigate the role of ultrasound radiofrequency (RF)-data technique in detecting the relationship between carotid IMT and changes of carotid wall elasticity in individuals with CVRFs.

Methods: One hundred and fifty three participants (IMT<1.0mm) without clinical CVD were classified as the CVRFs patients group with at least one CVRFs (n=107) and control group without CVRFs (n=46). Carotid IMT and arterial wall elastic parameters (including distensibility coefficient (DC), compliance coefficient (CC), stiffness (β), β stiffness (β) and single point pulse wave velocity (PWV)) were measured automatically by ultrasound RF-data technique in all participants. We underwent the following analyses, (1) the correlation between IMT and carotid wall elastic parameters in all participants, (2) the difference of carotid wall elastic parameters between two group, (3) the difference of arterial wall elastic parameters in participants grouping with the number of CVRFs.

Results: IMT negatively correlated with DC and CC, positively correlated with β, β and PWV, and the correlation coefficient were -0.396, -0.347, 0.452, 0.352 and 0.518, respectively (P<0.05). DC, CC, β, PWV and PWV group of control were 0.027 ± 0.012Kpa, 1.01 ± 0.45 mmKpa, 4.31 ± 2.60, 8.81 ± 5.22 and 6.71 ± 2.06 m/s, and that of the CVRFs patients group were 0.016 ± 0.012 Kpa, 0.71 ± 0.32 mmKpa, 6.41 ± 3.24, 10.87 ± 3.69 and 7.61 ± 2.19 m/s, respectively. Comparing with the control group, DC CC decreased, β and PWV increased (P<0.05) in the CVRFs patients group. Along with the increasing number of CVRFs, DC decreased, β and PWV increased (P<0.05), CC decreased (P<0.05).

Conclusions: The carotid wall elastic parameters measured by ultrasound RF-data technique may have broad clinical applications for detecting early stage atherosclerosis.

GW25-e4460
Diagnostic accuracy of 320-slice dynamic volume computed tomography angiography for detection of coronary artery stenosis compared with selective coronary angiography
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Objectives: To evaluate the diagnostic accuracy of 320-slice dynamic volume CT (DVCT) coronary angiography, as a non-invasive imaging tool in assessment of coronary artery stenosis in comparison with selective coronary angiography.

Methods: The study included 172 patients (108 males, 64±11.5 years) with suspected coronary artery disease who were referred for 320-slice DVCT coronary angiography (Aquilion One, Toshiba Medical) followed by selective catheter coronary angiography. The 320-slice angiographic CT scans were acquired using a 320 CT scanner. Image quality was analyzed. The catheter coronary angiographic studies were performed via radial or femoral arterial puncture. The results of CT angiography were compared with the gold standard catheter angiography. Lesion with >50% diameter stenosis were considered significant. The sensitivity, specificity, positive and negative predictive value of detecting mild, moderate, severe coronary stenosis, occlusive coronary artery and ≥50% coronary stenosis were calculated.

Results: The images acquired from 320-DVCT were excellent and sufficient and can be used to evaluate coronary stenosis. the sensitivity, specificity, positive and negative predictive value of 320-DVCT coronary angiography in detection of mild coronary stenosis were 90.9%,99.2%,89.6% and 99.3%, respectively, of moderate coronary stenosis, 92.8%, 98.9%, 90.9% and 92.9%, respectively, of severe coronary stenosis, 87.4%, 98.8%, 89.2% and 98.6%, respectively, of occlusive coronary artery, 50.0%, 99.0%, 66.7% and 99.8%, respectively, of ≥50% coronary artery stenosis 94.1%, 97.2%, 89.2%and 98.5%, respectively.

Conclusions: 320-slice DVCT angiography can provide accurate and reliable coronary artery imaging. 320-slice DVCT coronary angiography is a very helpful and non-invasive coronary imaging modality that enable to detect and grade coronary artery stenosis. Due to its very high negative predictive value, it may eliminate the need for invasive coronary procedures.

GW25-e5331
Assessment of Left Ventricular Twisting and Untwisting in Patients with Myocardial Infarction and Ischemia
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Objectives: To assess left ventricular twisting and untwisting in patients with myocardial ischemia at rest and myocardial infarction with different sites, searching for the value and characteristic left ventricular twisting and untwisting in patients with CAD by speckle tracking imaging (STI).

Methods: Routine echocardiography and Pulse-wave tissue Doppler imaging (PW-TDI) were performed in 60 patients with myocardial infarction (MI), 31 patients with myocardial ischemia and 30 control individuals who were all received coronary arteriography. According to the performances of ECG, patients with myocardial infarction were divided into anteroseptal MI (18), infer-posterior MI (21) and extensive infarction of the anterior wall (21). Twisting and untwisting were measured by speckle tracking imaging (STI), and the parameters of them were torsion, torsion rate and untwisting rate.

Results: The two patient groups, especially in patients with myocardial infarction, had much lower parameters in torsion (6.92±3.29 vs 11.65±2.70 vs 17.16±5.42, P<0.001, respectively), torsion rate (45.78±19.36 and 72.68±20.77 vs 99.51±32.13, P<0.001, respectively), untwisting rate (-49.88±2.47 and -82.91±16.37 vs -102.03±30.97, P<0.001 and P<0.05, respectively) than that of control group. Furthermore, comparing with the patients with anteroseptal and infer-posterior MI, the patients with extensive infarction of the anterior wall show significant decrease in torsion (4.23±2.62 vs 7.82±2.03 and 9.08±3.42, P<0.001, respectively), torsion rate (30.30±19.51 vs 53.76±14.85 and 54.38±18.80, P<0.001, respectively) and untwisting rate (-36.39±20.40 vs -56.94±21.96 and -59.11±25.76, P<0.05, respectively), while the differences between anteroseptal and infer-posterior MI was small. Besides, torsion had a significantly positive correlation with LVEF (r=0.618, P<0.001).

Conclusions: Torsion, torsion rate and untwisting rate derived by STI were decreased not only in patients with myocardial infarction but also in patients with myocardial ischemia at rest. Besides it is the infarction extent and size rather than the site to influence the twisting and untwisting in patients with myocardial infarction.

GW25-e0160
A New Strategy for Pericardiocentesis with a Visual Puncture System: A Feasibility and Efficiency Study in a Pericardial Effusion Model
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Objectives: Needle tip location is difficult to estimate during pericardiocentesis in some cases. This study investigated the feasibility and efficiency of pericardiocentesis with a visual puncture system in a pericardial effusion (PE) model.

Methods: A 0.9-mm microimaging fiber was delivered into a 18-gauge needle to develop a visual puncture system. Moderate and large PE models were developed by different ultrasound phantom. 10 inexperienced physicians were enrolled to perform 10 repeated pericardiocentesis in both PE models using the conventional method and the visual puncture system in a randomized order. The puncture to pericardium time and the procedure-related complications were recorded.

Results: Both groups achieved success pericardiocentesis. Although there was not different on the puncture to pericardium time between the two groups (P>0.05), the visual group had lower procedure-related complications rate to perform pericardiocentesis in moderate PE model compared to the conventional group (0% vs 23%, P<0.001).

Conclusions: Pericardiocentesis with a visual puncture system was feasible in a PE model. With visual guidance, this new strategy offered real-time assessment between the needle tip and epicardium. Therefore, it may help to reduce the procedure-related complications and provide an alternative strategy for pericardiocentesis in future.