Conclusions: 3D-contrast US improves intra-operator assessment for assessment of atheromata severely compared to 2D. It allows the measurement of the maximal IMT but only in combination with contrast agents. Therefore, 3D-contrast US is a promising technique for the assessment of atheromata in carotid arteries.

Material and methods: Intravascular ultrasound (IVUS) examinations were performed in 30 selected patients with CTOs who have presented an optimal angiographic effect without residual stenosis or dissection after balloon angioplasty. Group consisted of 25 males and 5 females with mean age 50 years. To evaluate the time of LAD occlusion we used the date of documented acute myocardial infarction or last, the strongest episode of stenocardial pain. For better lesion characterization we used the classification of coronary angiography following balloon angioplasty proposed by Gerber et al. and measure circumferential distribution and percentage of lesion calcification.

Results: We observed following types of morphology in Gerber classification: Type 1 with smooth walled dilatation of concentric plaque - 2 pts (7%). Type 2 with superficial tear of concentric plaque - 17 pts (56%). Type 3 with deep tear to media - 2 pts (7%). Type 6 with smooth-walled dilatation of eccentric plaque 6 pts (27%). Type 7a with subintimal dissection of eccentric plaque 1 pts (3%). The mean percentage of calcification in all quadrants group was 55±21% (49% in group with type 1 and 2 and 67% with types 3-7a).

Conclusions: Despite of satisfactory angiographic effect following balloon angioplasty in patients with chronic total occlusion - the use of intravascular ultrasound showed in more than 30% of patients the complex, substantial lesions (in Gerber classification) with large degree of coronary calcification.

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Volumetric intravascular ultrasound parameters assessment of plaque development in saphenous vein grafts
P. Weglez 1 ; A. Filipiecki 1 ; J. Drezewicki 1 ; M. Trusz-Gluzsa 1 ; M. Krecza 1 ; A. Bochenek 1 ; J. Dijkstra 2 ; I. Reiber 1
1Siemens Medical Solutions, Innovations Dept., Mountain View California, United States of America

Purpose: Recently, non-invasive imaging techniques have detected rotary blood flow in the ascending and descending aorta. Existence of this rotary blood flow and its possible relationship to ventricular torsional deformation is just starting to be explored. It has also been postulated that rotary blood flow is related to the geometry of the aorta and that the flow may be altered in certain disease states. (1)

It is also well known that there is a normal helical flow pattern in the aorta, which we looked at VVI which displays the magnitude and direction of the wall as an indirect result of flow. As reported by HUP ACC 2006, VVI can be used to visualize the wall mechanics of the aorta. (1) We wanted to observe the biomechanical stresses within the aortic wall, and compare to the LV twist in a full 3D RT volume data set. Earlier wall shear changes may be an earlier marker of atherogenesis. It has also, been reported that coronary artery motion has potential significance in the localization of atherogenesis.

Purposes: Can RT3D and VVI be used to look at the arterial ventricular relationship, arterial-ventricular coupling, and to see if the early pattern changes in the aorta could be observed. Until now the representation of ventricular arterial coupling has been the Windkessel wave system. Assuming under-standing of the Windkessel model as a hydraulic integrator, we attempted to observe this physiological phenomenon using the RT3D to image the aorta at the root level and the left ventricle at the level of the apex. VVI uses the time-domain representation of ventricular arterial coupling.

Methods: We used the newly developed RT3D ACUSON Sequoia C512 system to image the aorta at the root level and the left ventricle at the level of the apex. VVI allowed us to look at the Aorta and ventricular wall mechanics (direction of motion and magnitude) of the aortic root and the LV apex on the same subjects. Velocity Vector Imaging was able to track the volume images of the aorta and ventricle and display the moving vectors, velocities, deformation.

Results: The observations were made by the investigators and noted to be consistent with the wave mechanism pattern observed in the aorta and the twist and untwist mechanics of the apex (figure below).

Conclusion: This was the first observation that the wall mechanics of the aorta and apex can indeed be imaged at the same time in the same beat and the observation in RT3D one sweep assessment of the arterial ventricular coupling can be seen and documented. This is a very early observation but it does open the possibilities to validate this observation in pathology.

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An intravascular ultrasound study in morphologic lesion characteristics of chronic total occlusions of left descending coronary artery after PTCA
T. Niklewski 1 ; M. Gasior 1 ; M. Gierlotka 1 ; L. Poloniski 1 ; A. Lekston 1 ; K. Wilczek 1
1Silesian Center For Heart Disease, 3rd Dept. Of Cardiology, Zabrze, Poland

Background: Chronic total occlusion (CTO) lesions of the left descending coronary artery (LAD) are frequently difficult to cross and are at high risk for acute reocclusion or chronic vessel renarrowing. CTO was defined as lesions occluded for a period of 2 weeks or more, and TIMI 0 flow.

Conclusions: Evaluation of interventions asynchrone before and after cardiac resynchronisation therapy (CRT) in patients with congenital heart defects (CHD) by means of Tissue Doppler Echocardiography (TDE)
R. Schuck 1 ; A. Rentzsch 1 ; M.Y. Abdel Rahman 1 ; M. Yegitbasi 2 ; B. Peters 2 ; F. Berger 1 ; H. Abdul-Khaliq 1
1Deutsches Herzzentrum Berlin, Berlin, Germany; 2Universitätsklinikum des Saarlandes, Klinik for pediatric cardiology, Homburg/ Saar, Germany; 2University of Cairo, Clinic for Pediatric Cardiology, Cairo, Egypt

Background: Identification of Patients with heart failure, who may benefit from CRT is still challenging, due to the limitations of conventional methods and the heterogeneous morphologies in congenital heart disease. TDE-derived maximal Strain allows quantitative assessment of regional myocardial function, as well as the time interval to maximal deformation allowing measurement of interventricular delay between RV and LV.

Patients and methods: 20 Patients with CHD (ISTA 3, DORA 1, TOF 3, L-TGA 5, D-TGA 1) and DCM (n=7) underwent conventional Doppler- as well as TDE-examination (Vingmed, Vivid 7) before, immediately after CRT, and finally during a follow-up period of six months. In an apical four chamber view using high frame rates (180-250 bps) strain (%) was analysed. The time interval from peak Q in the parallel recorded ECG, to the maximum of systolic deformation, in accordance with previously marked aortic valve clo-