CONTRAST ECHO

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Usefulness of contrast transthoracic echocardiography in the assessment of aortic dissection
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The usefulness of contrast transthoracic echocardiography (TTE) in aortic dissection has not been validated. With this aim we conducted 86 consecutive patients with aortic dissection who underwent contrast TTE and transesophageal echocardiography (TOE). The results were compared with those obtained by MRI or CT.

Results: Contrast TTE diagnosed entry tear located in distal ascending aorta and aortic arch in 29 cases. TOE suspected only 8 of these. Contrast TTE defined false lumen entry flow severity in all cases and permitted the assessment of proximal descending aorta but was limited for distal thoracic aorta. In abdominal aorta, contrast TTE facilitated the diagnosis of false lumen drainage and distal re-entry tears. Comparison of proximal and distal descending aorta contrast pattern was very useful for understanding false lumen flow hemokinetics and pressures.

Conclusion: Contrast transthoracic echocardiography is highly useful in assessment of aortic dissection, particularly in the upper third of ascending aorta, arch and abdominal aorta. Overall arterial aorta aortic dissection assessment of aortic dissection contrast echocardiography provides information that may be significant for improving management of this disorder.

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Factors influencing the degree of left ventricular myocardial microvascularization
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Background: Microvascular disease is caused by hypertension, diabetes mellitus and dyslipidemia and is characterized by a reduced myocardial perfusion reserve. We have previously demonstrated that quantitative myocardial contrast echocardiography (QMEC) can be used to measure in vivo the relative myocardial blood volume (RMBV) which is the ratio of blood volume within the myocardium and the total myocardial volume. Moreover we have shown that in hypertensive heart disease RMBV is reduced as compared to athlete’s heart. We sought to analyze the influences of demographic, cardiovascular risk factors and medication on the extent of myocardial perfusion and perfusion measured by RMBV.

Methods: 191 patients (18 women and 113 men) were included in the retrospective analysis. 85 patients with coronary artery disease and 66 patients without. Quantitative myocardial contrast echocardiography (QMEC) was carried out in all patients. The RMBV was calculated as the ratio of the signal intensity within the myocardium to that in the adjacent left ventricle. The mean RMBV was calculated by averaging RMBV of the septal, lateral and inferior segment. Univariate analysis of 29 variables of demographic, hemodynamic, cardiovascular risk factors and medica-

ion and laboratory values was performed. Multivariate analysis was carried out by multiple regression analysis with mean RMBV as the dependent variable.

Results: Mean±SD patient age was 45±16 years. Univariate analysis revealed a lower value of RMBV for one of the following factors: arterial hypertension (p<0.001), smoking (p<0.004), diabetes mellitus (p<0.0001), dyslipidemia (p<0.001), acetylsalicylic acid (p=0.004), angiotensin-converting enzyme inhibitors (p=0.014), calcium antagonists (p=0.002), nitrates (p<0.015), diuretics (p<0.034). Multivariate analysis by means of multiple regres-

sion showed a lower value of RMBV only for hypertension (p<0.001) and smoking (p<0.001).

Conclusion: Among a multitude of demographic and clinical variables, the extent of myocardial microvascularisation. i.e. RMBV, is negatively influenced only by arterial hypertension and smoking.

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Detection of apical thrombus after anterior myocardial infarction by left ventricular opacification with contrast echocardiography
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Anterior MI predisposes to apical thrombus formation and systemic embolization. Reliable detection of apical thrombus could modify therapy, influencing the decision to add oral anticoagulation to mainstay antiplatelet medication.

Aim: To evaluate the value of LV opacification using contrast echocardiography (CTRST) in the detection of apical thrombi in patients after anterior myocardial infarction (AMI) and compare it to echocardiographic findings after anterior MI.

Methods: Ninety-six consecutive patients hospitalized for anterior MI were prospectively enrolled. Inclusion criteria were enzymatic and ECG changes consistent with AMI, and suboptimal visualization of apical segments or extensive apical akinesia/dyskinesia by transthoracic echocardiography. All patients underwent non-contrast imaging and CTRST with perfusion and harmonic imaging the same day, within 8 days of MI. The digitized images from 4 views (apical 2-, 3-, 4-chamber, and parasternal short-axis at the apex level) were independently reviewed by 2 experienced echocardiographers and rated for apical thrombus as definite thrombus, possible thrombus, absence of thrombus or not interpretable apex. Visual interpretation was evaluated using the endocardial definition score (EDS ; 0 = endocardial border not visible; 1 = poorly visible; and 2 = clearly visible).

Results: Apical thrombus could not be ruled out (rated definite or possible thrombus, or not interpretable apex) in 69/96 patients (66.4%) with NOCMI vs. 39/96 patients (34.4%) with CTRST (p=0.0005). Exams were considered not interpretable for apical thrombus by both readers in 10/96 patients (10.4%) with NOCMI vs. 5/96 patients (5.2%) with CTRST (p=0.014). Interobserver agreement for the qualitative rating of apical thrombus (definite, possible, absent or not interpretable) was 55.2% for NOCMI vs. 71.9% for CTRST (p=0.02). Interobserver agreement for absence of apical thrombus was higher with LV opacification with kappa = 0.71 for NOCMI vs. kappa = 0.94 for CTRST. Analysis of apical segments EDS showed clear endocardial visualization in 46.9% of LV apical segments using NOCMI vs. 59.5% with CTRST (p<0.0005). Interobserver agreement for apical segments EDS was higher with LV opacification with kappa = 0.65 for NOCMI vs. kappa = 0.73 for CTRST.

Conclusion: CTRST facilitates exclusion of LV apical thrombi and allows enhanced endocardial definition in addition to higher interobserver agreement for endocardial delineation of LV apical segments when compared to NOCMI in patients with recent anterior MI.

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The perfusion score index in the subacute phase as measured with real-time myocardial contrast echocardiography correlates with infarct size in patients with acute myocardial infarction
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Background: Evaluation of myocardial damage is important for risk stratification in patients after acute myocardial infarction (AMI). While assessment of wall motion after AMI is unreliable due to myocardial stunning, assessment of myocardial perfusion with myocardial contrast echocardiography (MCE) may give a more accurate measure of true myocardial damage. We investigated whether MCE accurately predicts myocardial damage in AMI patients in the subacute phase.

Methods: We studied 13 AMI patients with 2D echocardiography, and MCE (Sonovue, HP7500, at rest and during adenosine stress (12 patients) within 2-5 days. Infarct size was estimated with peak concentrations of CK-MB (Ug/mL). Myocardial perfusion was analysed (16 segments) by scoring myocardial perfusion as normal (1), patchy (2), or absent (3). Segmental wall motion was analyzed independently and was scored as normal (1), hypokinetic (2), akinetic (3), or dyskinetic (4). Perfusion score index (PSI) and wall motion score index (WMSI) were calculated (total score divided by number of segments) for each patient.

Results: Mean (SD) WMSI was 1.48±0.22. Mean CK-MB was 102±59 µg/mL. PSI at rest was 1.29±0.26 at rest and 1.19±0.15 during hyperemia. Significant correlations were demonstrated between the WMSI and the PSI at rest (r=0.76, P<0.01), the WMSI and the PSI during hyperemia (r=0.79, P<0.01), and the WMSI and CK-MB (r=0.71, P<0.01). The PSI correlated significantly with the PSI at rest (r=0.79, P<0.01), and the PSI at stress (r=0.90, P<0.01).

Conclusion: The PSI in the subacute phase after AMI significantly correlates with enzymatic myocardial damage. Assessment of myocardial perfusion, especially during hyperemia may be a more accurate method to assess true myocardial damage than wall motion analysis.

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Impact of 4 different reperfusion strategies on microvascular damage after acute myocardial infarction: results from the acute myocardial infarction contrast imaging (A.M.I.C.I.) multicenter study
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Background: The restoration of adequate microvascular flow after reperfusion in AMI is the primary condition for the myocardium to stay alive. The aim of this study was to assess the impact of 4 different coronary reperfusion strategies on microvascular damage and myocardial salvage.


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