Tissue Doppler, Speckle Tracking and Strain Imaging

## Global longitudinal strain at rest predicts significant coronary artery stenosis in patients with peripheral arterial disease

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**Background:** Critical peripheral artery disease (PAD) is expression of systemic chronic atherosclerosis, it being often associated with cardiovascular events. The assessment of global longitudinal strain (GLS) at rest by speckle tracking echocardiography could be useful to unmask significant coronary artery disease (CAD) in asymptomatic PAD patients.

**Purpose:** To determine whether resting GLS is able to predict significant coronary artery stenosis in PAD patients selected for peripheral or carotid angiography.

Methods: One-hundred three clinically relevant PAD patients (M/F = 76/27, age = 66.8 ± 10,2 years, 72 with significant lower limb artery stenosis and 31 with carotid artery stenosis ≥50%), asymptomatic for CAD, underwent standard echo-Doppler exam at rest, comprehensive of GLS analysis, prior peripheral and coronary angiography. Information on cardiovascular (CV) risk factors and comorbidities were collected. Patients with know CAD and previous myocardial infarction, left ventricular (LV) ejection fraction < 50% and inadequate echocardiographic imaging were excluded. According to the results of coronary angiography, patients were divided in two groups: with significant coronary artery stenosis (>50% of obstruction. n = 73) and without significant coronary artery lesions (n = 30).

**Results:** No intergroup difference in the prevalence of CV risk factors and comorbidities was found. Age, body mass index and blood pressure were comparable between the two groups. LV ejection fraction  $(59.9 \pm 4.2\%$  in patients with significant coronary stenosis vs.  $60.2 \pm 4.7\%$  in those without coronary stenosis, p = 0.75) and wall motion score index  $(1.02 \pm 0.09 \text{ vs } 1.03 \pm 0.09 \text{ respectively}, p = 0.67)$  did not differ significantly. Conversely, GLS was lower in patients with significant coronary artery stenosis than in those without  $(21.6 \pm 2.7\% \text{ vs. } 22.8 \pm 2\%, p < 0.02)$  (Figure 1). This difference remained significant comparing the carotid subgroup with coronary stenosis vs. those without (p < 0.05) whereas it did not achieve the statistical significance in patients with lower limb artery lesions (p = 0.42).

**Conclusion:** In PAD patients, GLS at rest shoes the capability in identifying patients at higher probability of significant coronary artery stenosis. This involves in particular patients with carotid artery stenosis. GLS might be helpful to select patients who need to extend the peripheral angiographic evaluation to the coronary tree.