Angioplasty of flow limiting stenosis improves left ventricular diastolic dysfunction in patients with peripheral artery disease

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Background: Peripheral artery disease (PAD) is associated with hypertension and left ventricular diastolic dysfunction (LVDD).

Objective: We hypothesized that endovascular treatment of flow limiting peripheral stenosis may improve LVDD.

Methods: In this prospective single center trial, 23 patients with PAD Rutherford stage 2–4 were included. Augmentation index (AIx), central systolic blood pressure (cSBP) and ankle brachial index (ABI) were measured at baseline one day before, one day after and at follow up 4 months after angioplasty. LVDD was assessed by echocardiography at baseline and at follow up.

Results: Mean E/E' ratio was significantly lower at follow up (11.9±4.4 to 10.2±4.4; $p<0.01$). Likewise, left atrial size (17.2±5.3 to 13.6±4.7 mm; p=0.014) decreased significantly, but not left atrial volume index (LAVI, 49.73±21.6 to 38.29±17.3 mL/m^2; p=0.062). ABI acutely increased in the intervened leg and remained stable at follow up (0.71±0.13 to 0.84±0.13 to 0.89±0.18; $p<0.001$). AIx (from 30.5±6.1 to 26.5±9.2; p=0.03) and cSBP (from 133±21 to 126±20 mmHg; p=0.05) acutely decreased after angioplasty. At follow up, there was no significant change in central hemodynamics (AIx, cSBP) as compared to baseline.

Conclusion: Chronic effects of angioplasty are associated with favorable improvement of diastolic function but not central hemodynamics.