

Left ventricle myocardial deformation pattern in severe aortic valve stenosis without cardiac amyloidosis. AMY-TAVI study

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Background: The Longitudinal Strain (LS) pattern in cardiac amyloidosis (CA) typically spares the apex of the heart, and this is a sensitive and specific finding that can be used to distinguish AC from other causes of left ventricular (LV) hypertrophy.

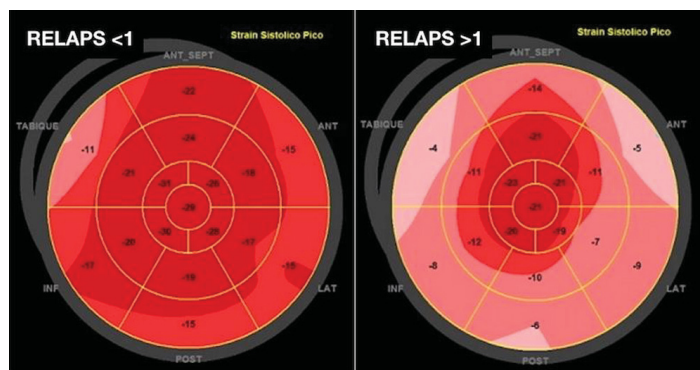
Purpose: To assess the clinical profitability of the LV deformation echocardiographic criteria derived from LS described as suggestive of CA, in patients with severe symptomatic aortic stenosis (AS) without amyloidosis referred for TAVI.

Methods: Within AMY-TAVI study (NCT03984877). Prior to TAVI implantation, conventional echocardiographic parameters were analyzed, along with LV deformation parameters and strain phenotype using Speckle-Tracking Echocardiography. Strain derived Indices accepted for CA screening were calculated: RELAPS: relative apical LS (average apical LS/sum of the average basal and mid LS); SAB: septal apical to base ratio (apical septal LS/basal septal LS); EFSR: ejection fraction strain ratio (LVEF/GLS). After implant, technetium pyrophosphate⁹⁹ scintigraphy and proteinogram were performed to diagnose or exclude CA, and those patients in which CA was excluded were selected.

Results: 109 patients were consecutively included. The mean age was 81±6 yo, 58% were women. The mean aortic valve area (AVA) was 0.7±0.1

cm² and the mean LVEF was 57.8±15%. Strain analysis could only be performed in 92 patients. Of these, 39 (42%) presented a LV strain pattern with relative apical sparing of LS respect to basal and middle segments (RELAPS>1 pattern); 82 patients (89%) SAB was >2.1; and 39 (42%) showed EFSR >4.1. The RELAPS>1 pattern was significantly associated with greater severity of AS based on AVA (0.7 cm² in RELAPS <1 vs 0.6 cm² in RELAPS >1, p=0.041), maximum velocity (4,4 vs 4,7 m/s, p=0.018), maximum aortic valve gradient (81 vs 91 mmHg, p=0.021) and medium gradient (49 vs 56 mmHg, p=0.020); higher degree of LV hypertrophic remodeling (Maximum wall thickness 14,3 vs 16,1 mm, p=0,003; Relative wall thickness 0,5 vs 0,6 mm, p=0,008); LV mass index: 168 vs 192 gr/m², p=0,005; LV end-diastolic volume 112 vs 91 ml, p=0,005), and significantly lower myocardial contraction fraction (0,22 vs. 0,18, p=0,001).

Conclusions: In our series, patients with severe symptomatic AS without CA referred for TAVI frequently present a strain phenotype with relative apical preservation and a LVEF/GLS ratio similar to those described in CA. Our results suggest that the classic patterns of CA are common in patients with severe AS, in absence of said pathology, which limits its use for CA screening in these patients.



Polar map patterns according to RELAPS