Determinants of Symptoms in Aortic Stenosis: Influence of Longitudinal Strain

Attias, David[1]; Dreyfus, Julien[1]; Vahanian, Alec[1]; Monin, Jean-Luc[2]; Messika-Zeitoun, David[1]
[1]Bichat Hospital, Cardiology, Paris, France; [2]Mondor Hospital, Cardiology, Creteil, France

Background: Global and Basal Longitudinal strain (GLS/BLS) as assessed using two-dimensional speckle-tracking imaging have been proposed as subtle marker of left ventricular (LV) systolic dysfunction with a promising prognostic value in asymptomatic patients with aortic stenosis (AS). However, the relationship between longitudinal strain, functional status, AS severity and LV ejection fraction (LVEF) remained unclear.
Methods: GLS and BLS were measured in 171 patients with pure, isolated, and at least mild AS prospectively enrolled at two institutions. We divided our population into 4 groups: asymptomatic non-severe AS (N=55), asymptomatic severe AS with preserved LVEF (N=37), symptomatic severe AS with preserved LVEF (N=60) and severe AS with reduced LVEF (< 50%) (N=19).
Results: GLS was significantly different among the 4 groups ($p<0.0001$) but the difference was mainly due to patients with reduced LVEF. In addition, there was an important overlap between groups and in multivariate analysis, after adjustment for age, gender, AS severity and LVEF, GLS was not an independent determinant of the functional status ($p>0.07$). BLS was also significantly different between the 4 groups ($p<0.0001$) but in contrast to GLS, BLS was an independent determinant of the functional status ($p< 0.01$). However, as for GLS, there was an important overlap and differences between groups were close to intra- or inter observer variability (1.3±1.1% and 2.0±1.6% respectively).
Conclusions: In this prospective multicenter cohort of patients with AS, we showed that BLS but not GLS was independently associated with symptomatic status. However, there was an important overlap between groups and differences were small, close to measurements' reproducibility raising caution regarding the use of longitudinal strain in the decision-making process of patients with severe AS.