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STRUCTURAL AND FUNCTIONAL DIFFERENCES IN PHYSIOLOGICAL VERSUS PATHOLOGICAL PATTERNS OF LEFT ATRIAL REMODELING: A SPECKLE TRACKING STRAIN ECHOCARDIOGRAPHY STUDY

Oral Contributions

West, Room 3005

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Background: Left atrial (LA) remodeling increases the risk of atrial fibrillation (AF). However, few studies have compared LA deformation in physiological and pathological patterns of LA remodeling. We therefore investigated the relation between LA and LV strains (ϵ) as a determinant of indexed LA volume (LAVi) in athletes and non-athletes over a wide range of age and diastolic function.

Methods: A total of 143 subjects were studied in two groups: 91 healthy volunteers included 77 athletes, and 52 patients with diastolic dysfunction including 27 patients with AF. LAVi was correlated with diastolic function and speckle tracking derived global LA ϵ and LV ϵ .

Results: For patients, LA ϵ and LV ϵ (Fig. A and B) independently predicted LAVi ($R^2=0.51$, $P=0.04$ for both). In contrast, volunteers showed higher LA ϵ (40 ± 10 vs. $23\pm 12\%$, $P<0.01$) despite similar LAVi ($P=0.21$). LA ϵ in volunteers correlated with LV early ($r=0.36$; $P<0.01$), late diastolic ($r=0.39$; $P<0.01$) annular velocities and end-diastolic volume ($r=0.27$; $P=0.02$). LA ϵ showed diagnostic value in differentiating pathologic and physiologic LA remodeling (Fig. C; AUC, 0.84, $P<0.01$).

Conclusions: In patients with diastolic dysfunction, an increase in LA size is accompanied with reduced LA and LV deformation. LA size in athletes, however, is associated with dynamic diastolic flux of blood volume due to enhanced LV lengthening mechanics. This relationship may be useful for distinguishing patients with pathological and physiological pattern of LA remodeling.

