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Left atrial longitudinal strain as a marker of acute cellular rejection in heart transplant recipients: impact of intervender variability

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Introduction and purpose: Preliminary reports suggests that left atrial longitudinal strain (LALS) variables are a sensitive marker of acute cellular rejection (ACR) in heart transplant recipients (HTxR), discriminating between those studies without rejection and those with any grade of rejection. Intervender variability is a concern in the widespread use of this technique. Our objective was to compare the LALS evaluated by two different softwares.

Methods: From September 2014 to October 2016 we performed, in 18 consecutive adult HTxR in their first year posttransplantation, serial echocardiographic exams within 3 hours of the routine surveillance endomyocardial biopsies (EMB), in a single centre. Peak average longitudinal strain, and strain rate were measured in the left atrium in the apical four chambers view in all studies, using both softwares, its association with the presence of ACR was investigated, and intervender variability was evaluated.

Results: a total of 147 pairs of EMB and echo exams were performed, 65 with no rejection (grade 0R), 82 with any grade of ejection (grades 1R and 2R). Intraclass correlation coefficients for intervender reproducibility for LALS and LALSR were 0.4 (95%CI 0.26 - 0.57) and 0.3 (95%CI -0.06 - 0.52) respectively. The number of segments evaluable by each software was significantly different. Association of LALS with rejection is shown in the table.

Conclusions: In this monocentric prospective study, left atrial longitudinal strain variables were found to be a sensitive marker of acute cellular rejection in heart transplant recipients. Although intervender reproducibility was poor, these results were consistent between both software.

Results

Software	n/N (%)*	Variable	No ACR	ACR \geq 1	p value
Siemens	114/147 (77.5)	Peak atrial LS	19.4 \pm 7.4	15.5 \pm 6.3	0.006
	114/147 (77.5)	Peak atrial LSR	1.5 \pm 0.4	1.3 \pm 0.5	0.005
TomTec	131/147 (89.1)	Peak atrial LS	19.1 \pm 6.2	14.1 \pm 5.4	<0.005
	131/147 (89.1)	Peak atrial LSR	1.0 \pm 0.4	0.8 \pm 0.3	<0.005

n: number of exams evaluable by each software. **N:** total numbers of exams. *p = 0.01 for comparison between the proportion of exams evaluable by each software.