

Circumferential and longitudinal strain analysis in healthy cats and cats with hypertrophic cardiomyopathy using vendor-specific 2D speckle tracking echocardiography software

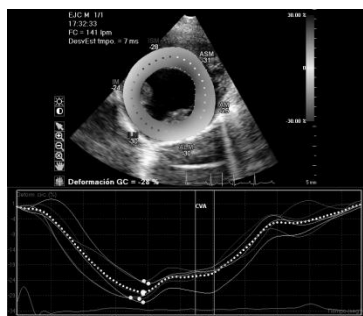
G. Santarelli¹, J. Talavera², M. J. Fernández Palacio²

¹ Hospital Clínico Veterinario, Campus Espinardo s/n, 30100 Murcia, giorgia.santarelli1@um.es

² Departamento de Medicina y Cirugía Veterinaria. Universidad de Murcia. España.

Strain (St) analysis performed by two-dimensional speckle tracking echocardiography (2D-STE) can aid the assessment of left ventricular (LV) myocardial function, and its feasibility in cats has been demonstrated [1-3]. In humans, differences in global LV deformation analysis performed with different 2D-STE software packages have been reported [4]. The aims of this study were: a) to determine global St variables in healthy cats using Philips vendor-specific software; b) to investigate possible differences in LV longitudinal global St values between healthy cats and cats with hypertrophic cardiomyopathy (HCM); both, not previously reported to the authors' knowledge.

Twelve clinically healthy cats (2-10 years-old; 3.6-6.2 kg body weight; 3 Domestic Shorthairs, 3 Maine Coons, 3 Persians, 2 Devon Rex, 1 Ragdoll) and 5 cats with HCM (1-7 years-old; 3.7-4.8 kg body weight; 4 Domestic Shorthairs, 1 Sphynx) were used for the study. Hypertrophic cardiomyopathy was diagnosed when LV thickness at end-diastole was ≥ 6 mm, and other diseases causing LV hypertrophy were excluded. Cats in the HCM group were free of medication, and without congestive heart failure. Transthoracic echocardiographic examination (2D, M-mode, color flow Doppler, spectral Doppler, TDI) was performed using a commercial echocardiographic system (iE33, Philips). Left ventricular circumferential and longitudinal global St values were determined via 2D-STE offline analysis using QLAB 9 software application package, from parasternal short axis images at the midpapillary muscle level and left parasternal long-axis apical images, respectively. Global St variables in healthy cats and cats with HCM were compared. Statistical analysis was performed with SPSS computer software, and differences in the parameters were assessed with the paired Student's test. $P < 0.05$ were considered statistically significant.



Technically adequate images were obtained in 94% of cats for circumferential analysis and in 88% of cats for longitudinal analysis. Mean circumferential and longitudinal global St values in healthy cats were $-22,27 \pm 2,97$ % and $-19,1 \pm 2,56$ %, respectively. Further, mean circumferential and longitudinal global St values in HCM cats were $-25 \pm 3,16$ % and $-16,4 \pm 1,67$ %, respectively.

Longitudinal global St values in HCM cats were significantly lower than those of healthy cats ($P = 0.031$).

In conclusion, CSt and LSt values in healthy cats obtained with Philips vendor-specific software are reported. Further, LSt values appear to be reduced in cats with HCM compared with healthy cats.

Referencias

- [1] Silva AC, Muzzi RA, Oberlender G, Nogueira RB, Muzzi LA, Reis GF, Mantovani MM. Longitudinal strain and strain rate by two-dimensional speckle tracking in non-sedated healthy cats. *Res Vet Sci.* 2013;95(3):1175-80.
- [2] Takano H, Isogai T, Aoki T, Wakao Y, Fujii Y. Feasibility of radial and circumferential strain analysis using 2D speckle tracking echocardiography in cats. *J Vet Med Sci.* 2015;77(2):193-201.
- [3] Sugimoto K, Fujii Y, Sunahara H, Aoki T. Assessment of left ventricular longitudinal function in cats with subclinical hypertrophic cardiomyopathy using tissue Doppler imaging and speckle tracking echocardiography. *J Vet Med Sci* 2015. 2015;77(9):1101-8.
- [4] Biaggi P, Carasso S, Garceau P, et al. Comparison of two different speckle tracking software system: does the method matter? *Echocardiography* 2011;539-547.