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1: [Am J Physiol.](#) 1991 Nov;261(5 Pt 2):H1402-10.

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Regional epicardial and endocardial two-dimensional finite deformations in canine left ventricle.

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We evaluated subepicardial and subendocardial two-dimensional finite deformations in the left ventricular (LV) anterior, lateral, and posterior regions in the closed-chest, conscious dog heart. Eight dogs underwent placement of 22 radiopaque markers in the LV myocardium. Sets of three markers were implanted in the anterior, lateral, and posterior subepicardium and subendocardium at the mid-ventricular level; reference markers were placed at apical and basal sites. Eight hours later, biplane videofluoroscopy was performed. Finite deformations for each subepicardial and subendocardial region were analyzed during three consecutive beats at end expiration. Circumferential shortening occurred in all layers and regions; similarly, longitudinal shortening occurred in all layers except that of the posterior endocardium. Values of principal strain were -0.19 ± 0.08 (SD) and -0.10 ± 0.03 for the anterior subendocardium and subepicardium, -0.20 ± 0.07 and -0.10 ± 0.02 for the lateral subendocardium and subepicardium, and -0.13 ± 0.02 and -0.10 ± 0.03 for the posterior subendocardium and subepicardium respectively (P less than 0.05 subendocardium vs. subepicardium). Second principal strain tended to be near zero or positive (from -0.01 ± 0.05 to 0.04 ± 0.05) in all regions. The end-systolic direction of principal strain was -29 ± 32 degrees and -34 ± 29 degrees in the anterior subepicardium and subendocardium, -47 ± 10 degrees and -30 ± 37 degrees in the lateral subepicardium and subendocardium, and -4 ± 29 degrees and $+7 \pm 23$ degrees in the posterior subepicardium and subendocardium. Anterior and lateral directions of principal strain were similar in the subepicardial and subendocardial layers and oriented along the epicardial fiber axis, but the posterior direction tended to be circumferentially oriented. (ABSTRACT TRUNCATED AT 250 WORDS)

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