IMAGES IN CARDIOLOGY

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Transthoracic tissue Doppler study of right ventricular regional function in a patient with an arrhythmogenic right ventricular cardiomyopathy

A 45 year old man was admitted because of ventricular tachycardia. He was known to suffer from arrhythmogenic right ventricular cardiomyopathy (ARVC). The rhythmic instability was quickly managed with amiodarone and atenolol. During evaluation of the patient's cardiomyopathy, echocardiography was performed. Left ventricular global function was normal, but hypokinesia of the basal segment of the lateral wall was observed. The right ventricle was enlarged and appeared hypokinetic, especially at the apex in apical long axis view. The pulmonary infundibulum was enlarged (upper panel). We looked at the tissue Doppler characteristics of the right ventricle, especially the free wall, to quantify regional right ventricular function. We then used tissue Doppler velocity (TVI) curve analysis (lower panel) and observed the disappearance of the base-mid apex velocity gradient, and the presence of an isovolumic relaxation event on the TVI curves of the ARVC patient, contrary to what is seen in normal individuals.

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(A) Parasternal short axis view with the enlarged pulmonary infundibulum and the pulmonary valve regurgitation. (B) Same view looking at the left ventricle (LV) and the enlarged right ventricle (RV). (C) Same observation in apical view. (D) Dilated inferior vena cava.

Tissue Doppler velocity (TVI) curve analysis and tissue tracking performed in one of the ARVC patients. There is no base-mid apex gradient, unlike in the control subject with normal right ventricular function. Note the presence of a negative isovolumic relaxation velocity in the ARVC patient ($\downarrow$). The isovolumic relaxation is free of any event in the normal subject.