



Case Study

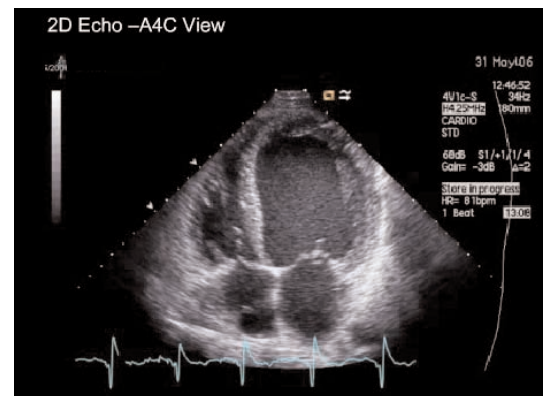
Diagnosis and Treatment of Inter-Ventricular Asynchrony

Patient History

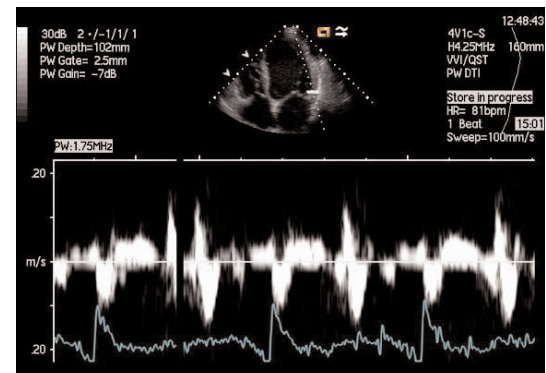
A 65-year-old male with a history of idiopathic cardiomyopathy presented with decreased exercise tolerance despite pharmacological treatment. Initial ECG and echocardiogram demonstrated an ejection fraction of under 35%, NYHA functional status of 3-4 and a QRS duration above 120msec. Cardiac resynchronization therapy (CRT), which has emerged as a viable treatment option for moderate-to-severe heart failure patients with ventricular dyssynchrony, was under consideration.

Traditionally, echo with Doppler tissue imaging has been employed in the CRT patient selection process. However, up to 30% of patients selected for CRT do not respond positively post-treatment. An echo with *syngo*® Velocity Vector Imaging™ technology (VVI) was proposed to obtain more detailed myocardial motion information. As a 2D technique without the angle limitations of traditional tissue Doppler, *syngo* VVI can evaluate the transverse movement of the myocardium. As such, it shows promise as a means to identify patients who are more likely to respond positively to CRT.

Image Findings



The asynchronous transverse (radial) motion seen in the apical four-chamber view cannot be quantified.



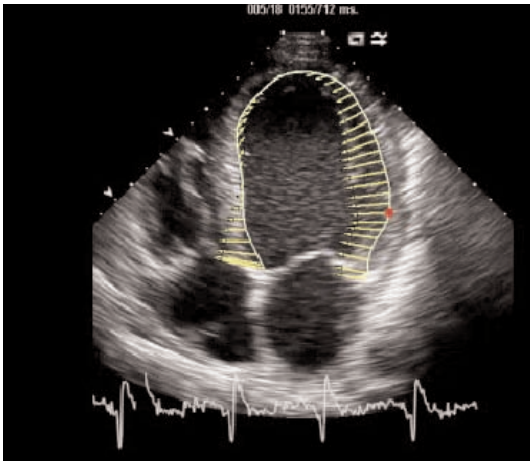
The patient's heart shows little longitudinal movement of the mitral annulus. Pulse-wave (PW) Doppler measures velocities along the axis of the ultrasound beam, so an adequate signal cannot be obtained.

Dr. Stéphane Lafitte

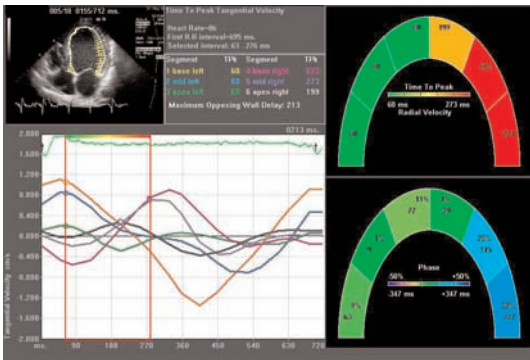
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syngo VVI both displays and measures the delay between opposing wall segments in the transverse (radial) direction, and allows an objective measure of the degree of asynchrony.



The measured delay was considered significant enough to justify CRT.

Clinical Outcome

The traditional qualifiers used for determining cardiac resynchronization therapy—EF, QRS length and NYHA class—have been shown to be inadequate in up to 30% of heart-failure patients who received this therapy. The addition of wall-motion delay quantification into the decision process for treatment options can improve patient selection and thus the clinical outcome of this procedure.

Ultrasound Solution

syngo VVI uses individual vectors to display direction and relative velocity of tissue motion from frame-to-frame, permitting instantaneous measurement of motion at any point in the cardiac cycle. It permits visualization of cardiac contraction-relaxation mechanics, providing information for rapid assessment of ventricular synergy in heart failure. *syngo VVI* works with any ACUSON Sequoia™ echocardiography system image, regardless of software revision or transducer.

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