

How Cardiac Imaging Helps Heart Failure Management

Thor Edvardsen

Cardiac imaging is of major importance in patients with heart failure. Different imaging techniques will help cardiologists with correct diagnosis and for improved treatment of patients. Echocardiography is the first line clinical imaging tool and this lecture will show how traditional and more modern echocardiographic techniques can assist cardiologists in daily clinical practice.

Myocardial strain measurements by speckle tracking echocardiography have been demonstrated to be a very accurate measure of LV function. One of the most important features of myocardial strain is that it can assist the cardiologist to detect early stages of myocardial diseases. This presentation will demonstrate on how you can use speckle tracking echocardiography as an additional and important diagnostic tool in a clinical setting with heart failure patients.

In the first phases of hypertrophic cardiomyopathy the typical findings are that left ventricular (LV) long axis function is reduced prior to a decrease in circumferential and radial function. Ejection fraction can remain unchanged despite a marked reduction in LV function. Assessment of systolic strain can also demonstrate dyssynchrony. There is, however, still disputable how we should use these indices to predict cardiac resynchronization therapy response. Measures of strain may also help defining the transmural extent of myocardial infarction and presence of viable myocardium.

Cardiac magnetic resonance (CMR) will give additional clinical information in many patients with heart failure. The use of contrast can reveal scarred myocardium with a specific pattern depending on the disease's etiology. This presentation will also demonstrate how clinicians can utilize information about cardiac function and myocardial structures from CMR in patients with heart failure.

Up-to-date assessment of left ventricular systolic function

Thor Edvardsen

Traditional assessment of left ventricular (LV) function has certain weaknesses. LV ejection fraction is a volume based method and can apparently seem normal in many myocardial diseases even if LV systolic function is severely decreased. M-mode can only give information about a very limited part of LV. Recent echocardiographic techniques like tissue Doppler imaging and speckle tracking echocardiography can reveal systolic dysfunction at an early stage in many myocardial diseases. Myocardial strain has proven to be an accurate measure of LV function and can assess both regional and global LV function. This presentation will mainly focus on how you can use these novel ultrasound tools in clinical practice. It will include assessment of LV from speckle tracking echocardiography and explain how to obtain valuable additional information about myocardial function. Examples of cardiac diseases where myocardial strain should be assessed are in patients with ischemic heart disease, hypertrophic cardiomyopathy, early detection of cardiotoxicity and more. A very useful technique is an average strain measure of 16 LV segments – Global longitudinal strain (GLS). GLS can provide accurate information in prediction of mortality. Another recent measure for use in detection of possible malignant arrhythmias is mechanical dispersion. Mechanical dispersion is a measure of inhomogeneous contraction pattern and reflects subtle contraction disturbances not detected by any other techniques.