

Quantitative phase analysis of myocardial wall thickening by technetium-99m 2-methoxy-isobutyl-isonitrile SPECT

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Regional wall thickening was assessed by ECG-gated SPECT using technetium-99m 2-methoxy-isobutyl-isonitrile ($^{99m}\text{Tc-MIBI}$). For myocardial segments with an optimal short axis, regional count changes from end-diastole to end-systole were used to calculate the regional wall thickening. Functional images displaying amplitude, % wall thickening (%WT), and phase were generated by a fundamental Fourier analysis.

In the control subjects, %WT analysis showed heterogeneous contraction among the left ventricular wall segments. The amplitude values showed a similar pattern to the %WT values. Phase images demonstrated that the timing of ventricular contraction was almost homogenous between the various wall segments. In the CAD patients, regional decreases in amplitude and %WT corresponding to zones of reduced perfusion were shown in the ischemic segments. Phase images also indicated asynchronous contraction in these segments.

Phase analysis of regional wall thickening in $^{99m}\text{Tc-MIBI}$ scintigraphy seems to be useful for understanding regional myocardial function in combination with perfusion scanning.

Key words: wall thickening, myocardial perfusion, phase analysis, technetium-99m 2-methoxy-isobutyl-isonitrile ($^{99m}\text{Tc-MIBI}$), SPECT image