

Poster presentation

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Relationship between infarct transmural and regional myocardial function at different levels of the left ventricle in patients with first-time ST-elevation myocardial infarction

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Introduction

The relationship between regional myocardial function and the transmural extent of infarction (TEI) is complex, and there is considerable overlap in wall thickening measurements between normal and infarcted segments. Some of this overlap is caused by tethering from neighbor segments, but could possibly also be caused by errors in wall thickening measurements due to: 1) through-plane motion in basal segments, and 2) oblique orientation of the image plane relative to the left ventricular (LV) wall in apical segments.

Purpose

To study the relationship between regional functional measurements and the TEI at the basal, mid-ventricular and apical levels of the LV.

Methods

Fifty-eight patients (44 male, age 58(8) yrs) underwent MRI 32(12) days after a first time STEMI involving the LAD (42%), CX (22%) and RCA (36%). Wall thickness and -thickening were quantified by cine short-axis ssfp-images at 1-cm intervals throughout the LV. TEI was measured using a phase-sensitive inversion recovery sequence in the same slices as the functional imaging, 10 min after a bolus of 0.15 mmol/kg gadodiamid. Infarcted myocardium was quantified using a cut-off of 2 SD relative to remote myocardium. All analyses were performed in the Segment software, using the 16 segment AHA model of the LV.

Results

Infarcted myocardium was found in 387 of 928 segments, and in these segments the average TEI was 27% (number of segments in different categories: 0%:541; 1-25%:223; 26-50%:90; 51-75%:47; 76-100%:27). For all 928 segments, TEI agreed moderately with absolute and fractional wall thickening ($r = 0.53$ and $r = 0.51$, respectively, both $p < 0.001$). There was no significant correlation between TEI and end-diastolic wall thickness. These relationships were similar for basal, midventricular and apical segments (Figure 1).

Conclusion

During the subacute phase after a first-time STEMI, the relationship between segmental infarct transmural and segmental wall thickening is moderately strong, and not different at the basal, midventricular and apical levels of the LV. End-diastolic wall thickness cannot be used to predict infarct transmural during this phase.

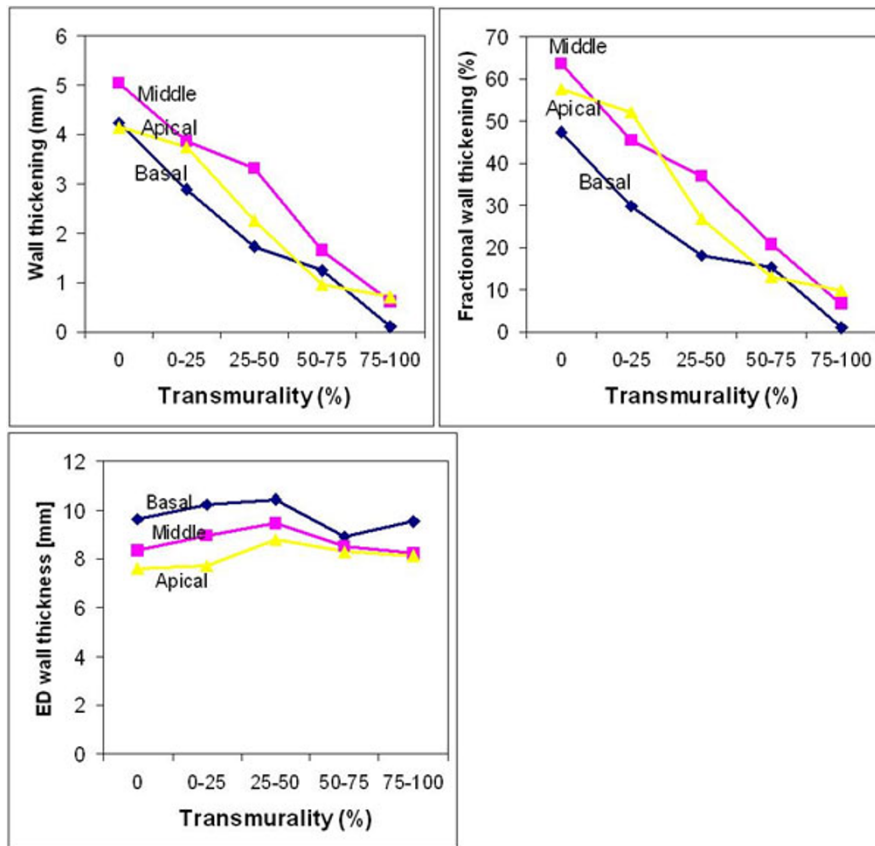


Figure 1

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