

Left ventricular thrombus formation after reperfused ST-segment elevation myocardial infarction: Insights from cardiac magnetic resonance imaging

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Interims report

Left ventricular (LV) thrombus formation is a relative common complication in survivors of acute ST-elevation myocardial infarction (STEMI) (1). Previous reports from the pre-PCI era found prevalence's of LV thrombi after myocardial infarction raging between 10 to 40%. Nevertheless, only few studies have reported on LV thrombus formation in contemporary STEMI populations.

Cardiac magnetic resonance (CMR) enables high-resolution imaging of the heart including LV thrombus detection. Importantly, blood–tissue contrast is higher as compared to echocardiography for LV thrombus detection (1, 2). This modality is therefore uniquely suited to assess the presence and determinants of LV thrombus formation in STEMI patients. The present project aims to (a) assess the prevalence of LV thrombus formation in contemporary reperfused STEMI patients as detected by cardiac magnetic resonance (CMR) imaging, (b) evaluate the determinants of LV thrombus formation, (c) compare the diagnostic accuracy of CMR versus transthoracic echocardiography, and (d) investigate the time course of LV thrombi in this setting.

So far, 552 patients after acute STEMI were included. The median age of the population is 57 [50-66] years and 83% are males. Cardiovascular risk factor distribution (hypertension [53%], diabetes mellitus [11%], hyperlipidemia [60%], smoking [55%]) is well comparable with current literature. The right coronary artery

was the culprit lesion in 40% of cases, the left anterior descending artery was the culprit lesion in 46% of cases, the left circumflex artery was the culprit lesion in 13% of cases and the ramus intermedius was the culprit lesion in 1% of cases. All patients underwent a complete baseline CMR investigation for infarct characterization. The median LV ejection fraction was 52 [45-58] % with an end-diastolic volume of 150 [126-172] ml and an end-diastolic volume of 72 [55-88] ml. The median infarct size was 19 [9-32] g representing 14 [7-24] % of the LV myocardial mass. From the overall population, 15 patients (2.9%) showed a LV thrombus at baseline CMR. Patients with LV Thrombus showed a significantly lower LV ejection fraction (37 versus 53%, $p < 0.001$) and a larger infarct size (18 versus 35 g, $p < 0.001$). Follow-up investigations including CMR scans at 4 months follow-up are currently ongoing. In addition, echocardiographic data is currently collected and data entry ongoing.

Taken together, the present study will provide novel insights into the prevalence, determinants and time course of LV thrombus formation after contemporary reperfused STEMI. Furthermore, it will provide data on the diagnostic accuracy of CMR imaging and echocardiography.

References

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2. Klug G, Metzler B. Assessing myocardial recovery following ST-segment elevation myocardial infarction: short- and long-term perspectives using cardiovascular magnetic resonance. *Expert review of cardiovascular therapy*. 2013;11(2):203-19.