

Usefulness of non-invasive myocardial work to predict left ventricular recovery and acute complications after acute anterior myocardial infarction treated by primary angioplasty

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Background: Predicting left ventricular (LV) recovery after acute ST-elevation myocardial infarction (STEMI) is challenging and of prognostic importance.

Objective: To evaluate the usefulness of non-invasive myocardial work (MW), a new index of global and regional myocardial performance, to predict LV recovery and in-hospital complications after STEMI.

Methods: Ninety-three consecutive patients with anterior STEMI (mean age, 59±12 years) treated by primary angioplasty underwent transthoracic echocardiography (TTE) within 24–48 hours after angioplasty and a median of 92 days at follow-up. MW is derived from the non-invasive strain-pressure loop obtained from the 2D strain data, integrating in its calculation the non-invasive brachial arterial pressure. Segmental LV recovery was defined as a normalization of segmental wall motion abnormalities of the affected segments and global recovery as an absolute improvement of left ventricular ejection fraction (LVEF) greater than 5% in patients with base-

line LVEF <50%. In-hospital complications were defined as a composite of death, reinfarction, heart failure, and LV apical thrombus.

Results: 1642 segments were studied and MW was impaired in infarct segments, more severely in no recovery versus recovery segments (MW index, constructive MW, MW efficiency, all, $p<0.01$). Furthermore, global MW was significantly correlated to acute and follow-up LVEF and global longitudinal strain (GLS) (all, $p<0.01$). Constructive MW was the best index to predict segmental ($p<0.01$ versus MW index, MW efficiency, and wasted work), and global recovery ($p<0.05$ versus GLS) with an independent association (all, $p<0.01$). Moreover, global constructive MW was independently associated to in-hospital complications which occurred in 18 patients ($p<0.01$).

Conclusion: In patients with anterior STEMI treated by primary angioplasty, acute constructive MW is an independent predictor of segmental and global LV recovery, as well as in-hospital complications.