

Left anterior descending artery wrapping around the left ventricular apex predicts additional risk of future events after anterior myocardial infarction

Anterior ST-segment elevation myocardial infarction (STEMI) owing to an occlusion of the left anterior descending artery (LAD) is associated with the highest risk of adverse clinical outcomes because of the large amount of myocardial territory supplied by the LAD compared with other coronary arteries (1, 2). In addition, anatomical features, such as a long LAD wrapping around the left ventricular (LV) apex, can play an important role in the outcomes in patients with anterior STEMI (3-5).

In this study, a wrap-around LAD was defined as an LAD wrapping more than one-fourth of the inferior wall of LV (6-8), and the frequency of LAD wrapping around LV apex was reported to be 26.4%–34.9%. Interestingly, even when the definition was expanded to include a minor wrap-around LAD (perfusion of the LV apex by any branch from LAD, with a prevalence of 76.0%–79.5%) (3, 4, 9, 10), wrap-around LAD has been reported to be associated with poor long-term outcomes. The following are the mechanisms of worse cardiovascular outcomes in patients with anterior STEMI and a wrap-around LAD compared with those without. (i) The infarcted myocardium territory is larger in patients with a wrap-around LAD and (ii) occlusion of a wrap-around LAD is associated with subsequent apical LV remodeling. Using cardiac magnetic resonance imaging (cMRI), we have reported that in patients who had a myocardial infarction (MI), having a wrap-around LAD was related to an apical wall infarction and a higher incidence of heart failure and stroke, regardless of the overall infarct size (3). In a subsequent larger study of patients with STEMI (4), we also showed that patients with a wrap-around LAD had a higher prevalence of stroke owing to LV mural thrombus and stent thrombosis, in addition to a higher prevalence of heart failure.

In this issue of *The Anatolian Journal of Cardiology*, Bozbeyoğlu et al. (6) describe the electrocardiography findings of patients with anterior STEMI and a wrap-around LAD. The authors concluded that inferior ST-segment elevation could occur in the following settings (i) distal LAD occlusion with a wrap-around LAD; (ii) wrap-around LAD only; or (iii) only distal LAD occlusion because the electrical vector of inferior leads during anterior STEMI would be affected by multiple factors

(balance of injury of anterior and/or inferior wall, collaterals, and others). This illustrates the importance of direct diagnoses of the occluded location of the infarct artery, injured myocardial territory, and their remodeling over time in relation to the optimal medical therapy. A recent study (11) that was conducted to detect LV thrombus within 30 days after MI showed that (i) LV thrombus remains common (8%); (ii) LV thrombi were mostly in LAD MI (94% of all LV thrombi); (iii) LV thrombus can occur even in the absence of aneurysm (76% of LV thrombus without aneurysm); and (iv) the sensitivity of echocardiography to detect LV thrombus (using cMRI as the gold standard) was limited (35% without contrast and 64% with contrast). Altogether, based on unique electrocardiography findings, detection of a wrap-around LAD by coronary angiography during primary percutaneous coronary intervention, followed by diagnoses of apical remodeling and thrombus seems to be a reasonable sequence of risk stratification in patients with LAD MI.

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