Evaluation of inflamed coronary atherosclerotic plaques by PET: More evidences for a promising area of cardiovascular imaging

To the Editor,

In the latest years, there is a growing interest in the early detection of inflamed coronary atherosclerotic plaques as major determinants of the risk of developing a symptomatic coronary artery disease (CAD). The possibility of using non-invasive techniques to identify high-risk lesions would be highly desirable both for prevention and for treatment evaluation of CAD.

18F-FDG PET/CT is a widespread technique able to detect inflammatory foci but, unfortunately, it is well known that the unpredictable myocardial glucose metabolism can be a serious limitation in its clinical use.

A recent paper by Joshi et al¹ evaluated 18F-fluoride PET/CT in the assessment of atherosclerotic plaques; despite limitations concerning some missing clinical information and the lack of images with a quantitative scale, the study seemed to indicate that 18F-fluoride is a better tracer to evaluate the presence of active calcification, macrophage infiltration, apoptosis, and necrosis as seen in culprit lesions. On the contrary, 18F-FDG was not considered to be sufficiently robust for a clinical application to the coronary circulation.¹

Other possible tracers of inflammation such as somatostatin-analogs have been also studied. A paper by Schatka et al² reported that 68Ga-DOTATATE PET/CT can characterize biologic activity of atherosclerotic plaque via SSTR-2 expression and that a targeted therapy with DOTATATE-based SSTR-2 results in a reduction of atherosclerotic plaque activity, thus suggesting a possible therapy strategy.

Now, the work by Blomberg et al³ adds another tessera in the process of optimizing PET/CT protocols in the evaluation of CAD and seems to rehabilitate FDG as an important tracer of atherosclerotic lesions.

In fact, the authors demonstrated that delayed 18F-FDG PET/CT imaging improves quantitation of atherosclerotic plaque inflammation over early imaging. Although the results are obtained evaluating large vessels, the same principle could be also transferred to coronary artery imaging. A strict dietary preparation⁴ along with a delayed scan could represent an important improvement in PET protocols, able to grant a successful and widespread clinical application to 18F-FDG.

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