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Letter to the Editor

OCT/atherectomy/pathology studies open new perspectives for *in vivo* characterization of plaque composition

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Dear Editor,

We read with interest the study by Habara et al. in IJC, October 2018 [1]. The authors performed OCT before and after directional coronary atherectomy (DCA) and correlated the OCT findings with histopathological and immunohistochemical features of the plaque samples. The data are very encouraging in particular regarding the ability of OCT of recognizing macrophages in the superficial plaque layers.

Imaging techniques able of distinguishing "cell phenotypes" need stringent evidence and validation. Recognizing inflammatory cells *in vivo* is current and clinically needed because their presence in vulnerable plaques increases the risk of plaque rupture. Past *ex vivo* OCT/pathology studies provided the basis for *in vivo* detection of macrophages by OCT (Consensus criteria) [2] now translating into novel clinical applications [3]. The study by Habara et al. is the first one *in vivo* that demonstrated high concordance between OCT and pathology detection of plaque macrophages.

In a future perspective OCT/pathology studies should be paralleled by non-invasive coronary imaging in order to integrate information from multimodality imaging, useful for CT and CMR interpretation. This is for promoting the *in vivo* implementation of the non-invasive diagnosis of vulnerable coronary plaques and identification of patients at risk of acute events.

A critical issue for replication of OCT/DCA/pathology studies is that plaque debulking is no longer needed. The clinical results of the past did not demonstrate superiority over any current revascularization procedure. However, special indications could emerge for novel DCA application [4] thanks to design innovation, like the new DCA catheters developed for bifurcations [5].

Conflict of interest

The authors report no relationships that could be construed as a conflict of interest.

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