



EDITORIAL COMMENT

Periodontitis is more than a local disease. Epicardial fat tissue amounts to more than an occasional finding



A periodontite é mais do que uma doença localizada. O tecido adiposo epicárdico representa mais do que um achado ocasional

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Available online 12 November 2020

The concept of atherosclerosis began as a local issue with the involvement of vessels of the heart, causing myocardial necrosis/ischemia; vessels of the brain, causing cerebrovascular accidents and peripheral vessels, causing intermittent claudication and other vascular limb issues.

According to this concept, the significance of atherosclerotic disease would depend on the importance of the affected vessel(s). In the case of coronary disease, greater importance would be attributed to the left main or left anterior descending artery (depending, of course, on the degree of obstruction) and disease of the right coronary artery would be considered less serious.

Atherosclerosis is now identified as a systemic disease with conventional and emerging new risk factors, some of which are still unknown and may potentially affect all vascular regions.

The local concept maintains its importance for vascular intervention, but in terms of prevention, as well as the understanding of the disease, the “systemic” approach to atherosclerosis seems to be the most consensual.

LDL cholesterol is the cornerstone of atherosclerosis. Today we have highly effective tools for lowering LDL and for reducing lipid atherosclerotic complications, however,

even with a significant lowering of LDL, events still occur. Inflammation can explain some of this residual risk.

Inflammation and inflammatory markers have long been associated with atherosclerosis and its complications. The more consensual inflammatory markers are C-reactive protein, interleukins, blood sedimentation rate and leucocyte cell count.¹

On the other hand, several inflammatory diseases, especially periodontitis, have been associated with atherosclerosis in multiple epidemiological studies.²

Experimental studies in rats confirm that periodontitis induces systemic inflammation and exacerbates atherosclerosis.³ In these circumstances, periodontitis represents a cause and may be a consequence of systemic inflammation, which has been linked to atherosclerosis in epidemiological and experimental studies.

Epicardial fat tissue (EFT) is the visceral fat depot of the heart. It can be assessed either by standard echocardiography, with a single thickness location, or by computed tomography, resulting in an assessment of total EFT volume.⁴

EFT is correlated with waist circumference and abdominal fat and is a marker of visceral fat. It has been associated with several clinical conditions, especially obesity, metabolic syndrome, diabetes, atherosclerosis and inflammation.

The extent of the role of EFT remains unclear, however it has mechanical, thermogenic, metabolic and endocrine

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<https://doi.org/10.1016/j.repc.2020.10.005>

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functions. EFT can be a therapeutic target as it can be reduced with drugs, in particular with metformin.^{5,6}

With the increasing prevalence of obesity and diabetes in developed countries, EFT emerges as an easy way to assess visceral adiposity and may also be a target for its treatment.

EFT has been associated with inflammation and atherosclerosis in several inflammatory diseases, such as lichen planus and psoriasis.^{7,8}

In the current edition of the Journal, Erdal et al. present a paper on the assessment by echocardiography of EFT in patients with severe periodontitis.⁹ They studied EFT assessed by echocardiography in 33 patients with grade 3 periodontitis and compared the results with those of 33 periodontally healthy controls. The groups were similar in age, gender and conventional echocardiographic measurements and presented no significant differences in terms of diabetes, hypertension, smoking habits and dyslipidemia. However, EFT was significantly higher in patients with periodontitis. They found a significant correlation between EFT and clinical parameters of periodontitis.

This study presents some points of interest, as well as some limitations.

As points of interest, the authors focused on two important and frequently forgotten markers of atherosclerosis: periodontitis and EFT. They proved EFT can be different in patients with the same cardiovascular risk profile, when assessed according to conventional risk factors, and, in these circumstances, periodontitis/inflammation can be a differentiating factor. This difference may weigh in on the decision over whether or not to begin therapy in patients with intermediate risk level, assessed according to conventional risk factor scores.

The main limitations of the study are the small population size and the use of echocardiography, which provides a limited assessment of EFT. Moreover, they assume that patients with high EFT will have a higher risk of developing atherosclerosis and its complications, such as coronary artery disease, but this concept is not supported, and could not be proven in the present case-control study. A case-control study can evidence an association of factors, but not causality.

In conclusion, this interesting paper highlights the importance of periodontitis and EFT in cardiovascular risk. They conclude that both markers are linked and assume they represent a high atherosclerotic risk.

More importantly, we need to define whether we are facing risk markers or risk factors, meaning whether these clinical markers can be reversed not only as parameters, but especially in terms of reducing the cardiovascular risk in primary and secondary prevention.

A long term randomized prospective study, with an adequate sample size, can provide answers to important question. Until we have these results, periodontitis and EFT are important markers of atherosclerosis. In addition, in terms of periodontitis, oral health must be maintained, not only for general health and but also possibly for vascular health. EFT associated with obesity and other metabolic diseases must be treated according to current guidelines.

Conflicts of interest

The author has no conflicts of interest to declare.

References

1. Geovanini GR, Libby P. Atherosclerosis and inflammation: overview and updates. *Clin Sci (Lond)*. 2018;132:1243–52.
2. Almeida APCPSC, Fagundes NCF, Maia LC, et al. Is there an association between periodontitis and atherosclerosis in adults? A systematic review. *Curr Vasc Pharmacol*. 2018;16:569–82.
3. Suh JS, Kim S, Boström KS, et al. Periodontitis-induced systemic inflammation exacerbates atherosclerosis partly via endothelial-mesenchymal transition in mice. *Int J Oral Sci*. 2019;11:21.
4. Sena CM. Epicardial adipose tissue: an important therapeutic target. *Rev Port Cardiol*. 2019;38:425–6.
5. Iacobellis G. Epicardial fat: a new cardiovascular therapeutic target. *Curr Opin Pharmacol*. 2016;27:13–8.
6. Ziyrec M, Kaharaman S, Ozdemir E, et al. Metformin monotherapy significantly decreases epicardial adipose tissue thickness in newly diagnosed type 2 diabetes patients. *Rev Port Cardiol*. 2019;38:419–23.
7. Ertem AG, Erdogan M, Koseoglu C, et al. Epicardial fat tissue thickness is increased in patients with lichen planus and is linked with inflammation and dyslipidemia. *Rev Port Cardiol*. 2016;35:525–30.
8. Raposo I, Torres T. Psoriasis strikes back! Epicardial fat tissue: another contributor to the high cardiovascular risk in psoriasis. *Rev Port Cardiol*. 2015;34:613–6.
9. Erdal E, Inanir M, Ustaoglu G, et al. Echocardiographic assessment of Epicardial Fat Tissue (EFT) thickness in patients with severe periodontitis. *Rev Port Cardiol*. 2020.