J Cardiovasc Imaging. 2018 Jun;26(2):63-64
https://doi.org/10.4250/jcvi.2018.26.e8
pISSN 2586-7210·eISSN 2586-7296

Journal of Cardiovascular Imaging JCVI

Editorial

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Epicardial Fat Thickness, Free Fatty Acid Can Predict Acute Ischemic Stroke in Patients with Atrial Fibrillation?

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▸ See the article "Epicardial Fat Thickness and Free Fatty Acid Level are Predictors of Acute Ischemic Stroke with Atrial Fibrillation" in volume 26 on page 65.

OPEN ACCESS

Received: May 28, 2018

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Conflict of Interest
The authors have no financial conflicts of interest.

Epicardial fat is closely related to blood supply vessels, both anatomically and functionally, which is why any change in this adipose tissue's behavior is considered a potential risk factor for cardiovascular disease development.[1] Epicardial fat is a white adipose tissue storage fat that cover 80% of the heart's surface, representing 20% of the organ's total weight. Adipose tissue is a biologically active organ regulating the metabolism of neighboring organs. It is also a major source of cytokines and hormones, acting as a localized gland. In the heart, epicardial adipose tissue is contiguous with the myocardium without fascia boundaries resulting in paracrine effects through the release of adipokines.[2] The close anatomic relationship of epicardial adipose tissue to the adjacent myocardium suggests possible local interactions between these tissues. Epicardial fat in states of positive energy balance, when the free fatty acids (FFA) in the blood are converted into triglycerides and accumulated initially in adipocytes and then in nonfat cells. Magnetic resonance and spectroscopy have demonstrated the strong correlation between epicardial fat volume and triglyceride concentration in the myocardium.[3] Under physiologic conditions, epicardial adipose tissue is thought to act as a buffering system against toxic levels of fatty acids between the myocardium and the local vascular bed. Thus, increased epicardial fat could scavenge excess fatty acids, which interfere with the generation and propagation of the contractile cycle of the heart, causing ventricular or atrial arrythmias and alterations in repolarization. Recently, a relationship between the thickness of epicardial adipose tissue and the incidence and severity of atrial fibrillation (AF) has been reported.[4] However, the potential association between epicardial fat thickness (EFT) and plasma FFA level in ischemic stroke with or without AF has not been previously investigated.

In this issue of the Journal, Cho et al.[5] demonstrated associations of EFT and serum FFA with ischemic stroke in patients with AF. They enrolled 214 consecutive patients (mean age, 66.8 ± 12.3 years) diagnosed with acute ischemic stroke. The ischemic stroke with AF group showed significantly higher serum FFA level (1,379.7 ± 717.5 vs. 757.8 ± 520.5 uEq/L, $p < 0.001$) and EFT (6.5 ± 1.2 vs. 5.3 ± 1.2 mm, $p < 0.001$) than the group without AF. They found that among patients with ischemic stroke, those with AF had poorer prognosis, significantly higher serum FFA level, and a significantly higher mean EFT than those without AF. In addition, serum FFA level was significantly correlated with EFT and serum FFA level and EFT were independently associated with stroke with AF. Even though their work is the first to

demonstrate associations of EFT and serum FFA with ischemic stroke with AF, the number of patients is very small and there are several limitations. They measured epicardial fat by 2-dimensional echocardiography. The fact that echocardiography is routinely performed in high-risk cardiac patients means that this objective measure could be readily available at no extra cost. Echocardiographic assessment of epicardial visceral fat would be less expensive than MRI or CT and would provide data on cardiac parameters that can be useful in the clinical management of patients with metabolic syndrome. However, echocardiography was a relatively simple and inexpensive method, the accuracy and reproducibility should be further tested. In addition, as epicardial adipose tissue has a 3-dimensional distribution, 2-dimensional echocardiography may not completely assess the total amount of epicardial adiposity. Further evaluation may be necessary. Further studies of this neglected tissue and its relationship with cardiac function, as well as of its use as a marker of metabolic and cardiovascular risk, should be encouraged.

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