

# Echocardiographic Measurement of Epicardial Fat Thickness

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**Key Words:** Echocardiography • Epicardial fat • Pericardial fat

Dear Editor:

Epicardial fat thickness (EFT) is highly associated with the incidence of cardiovascular disease and cardiovascular mortality.<sup>1</sup> Moreover, pericardial adipose tissue in the right ventricle plays an important role in arrhythmogenesis in Asian patients.<sup>2</sup> We have read the clinical research article by Aydin et al. with great interest, wherein the authors have described increased EFT and carotid intima thickness in patients with hemodialysis.<sup>3</sup> We agree with the authors about the importance of EFT in patients with hemodialysis and subclinical atherosclerosis. However, we have some reservations about echocardiographic measurements of EFT.

According to the consensus document,<sup>4</sup> pericardial fat comprises the visceral epicardial fat layer and parietal paracardial fat layer. Epicardial fat is the adipose tissue located between the myocardium and visceral pericardium, and the adipose tissue layer surrounding the parietal pericardium is called the paracardial fat layer.<sup>4</sup> Aydin et al.<sup>3</sup> described measuring epicardial fat at the adipose tissue layer, indicated by the arrow (Figure 1A, red). However, the layer surrounding the parietal pericardium is the paracardial fat layer and not the epicardial fat layer. The actual epicardial fat layer, which is located within the visceral pericardium, is highlighted (Figure 1A, green). The pericardial fat is often misinterpreted as the epicardial fat because both epicardial fat layer and paracardial fat layer are indistinguishably involved in measurements (Figure 1B, yellow). In addition, EFT should be measured on the right ventricular free wall at minimum two locations, from both parasternal long-axis and parasternal short-axis views, using the mean of three consecutive beats.<sup>5</sup> These provide the most accurate measurement of EFT.

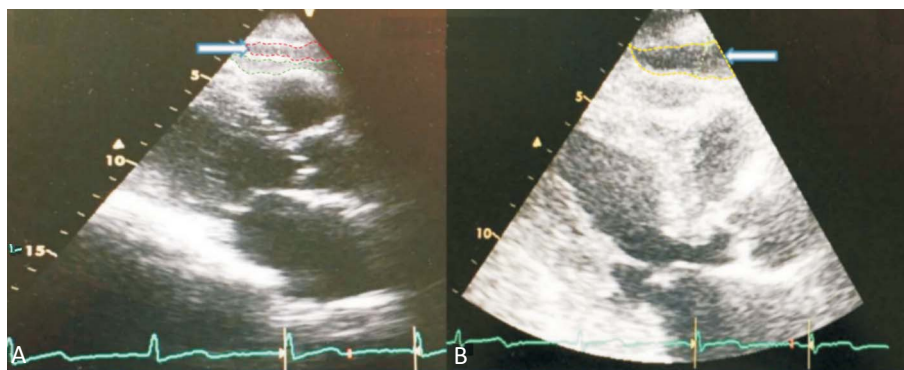
In conclusion, clinicians should be cautious to distinguish between the epicardial fat layer and the pericar-

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**Figure 1.** Echocardiographic measurement of the paracardial fat layer (red) and epicardial fat layer (green) (A). Echocardiographic measurement of pericardial fat (yellow) (B).

dial fat layer, which have different terminologies and pathophysiologies. EFT should be measured within the visceral pericardium in both the parasternal long axis and short axis view by echocardiography.

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#### DECLARATION OF CONFLICT OF INTEREST

All the authors declare no conflict of interest.

#### REFERENCES

1. Rosito GA, Massaro JM, Hoffmann U, et al. Pericardial fat, visceral abdominal fat, cardiovascular disease risk factors, and vascular calcification in a community-based sample: the Framingham Heart Study. *Circulation* 2008;117:605-13.
2. Tam WC, Lin YK, Chan WP, et al. Pericardial fat is associated with the risk of ventricular arrhythmia in Asian patients. *Circ J* 2016; 80:1726-33.
3. Aydin E, Altin C, Sakalliglu O, et al. Epicardial adipose tissue thickness and carotid intima-media thickness in hemodialysis patients. *Acta Cardiol Sin* 2017;33:266-72.
4. Talman AH, Psaltis PJ, Cameron JD, et al. Epicardial adipose tissue: far more than a fat depot. *Cardiovasc Diagn Ther* 2014;4: 416-29.
5. Iacobellis G, Willens HJ. Echocardiographic epicardial fat: a review of research and clinical applications. *J Am Soc Echocardiogr* 2009;22:1311-9; quiz 417-8.

