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REPLY

We are grateful to Drs. Ren and Callan for their important comments on our paper (1).

It is entirely true that the anatomical vicinity of the esophagus to the posterior wall of the left atrium is a potential cause of concern. However, the optimal visualization of the antral portion of the vein requires that the transducer be moved laterally from the target pulmonary vein. This maneuver effectively increases the distance between the ablation catheter and the esophagus, and potentially reduces risk of heating injury.

We concur with the observation that direct visualization of the left atrial roof and of the inferior veins may be challenging due to the immediate vicinity of the transducer probe. In these cases, a still-to-be-developed electronic spacer may be useful.

Although thermal injury of the esophagus may be generated by the heated probe itself, we usually carefully monitor the local temperature as displayed by the echocardiographic system and freeze the image when the temperature rises above 38.5°C. In the future, a cooled transducer probe may definitively overcome this issue.

It is entirely true that general anesthesia is required to perform continuous monitoring of radiofrequency ablation (RFA) of pulmonary veins (PVs) by 3-dimensional real-time transesophageal echocardiography (3D RT TEE); it is equally true that deep sedation or general anesthesia is preferred in several institutions performing RFA PVs in order to better control pain and discomfort from long-lasting procedures. In the future, smaller transnasal 3D RT TEE may significantly overcome the need of general anesthesia to perform the examination.

Finally, current 2-dimensional intracardiac echocardiography, differing from 3D RT TEE, provides a tomographic, but limited, view of atrial anatomy that requires continuous adjustments as the RFA catheter moves. Expertise in image reading is an essential requirement for both 2-dimensional and 3-dimensional echocardiography, and it is our personal opinion that currently, 3D RT TEE more accurately represents heart anatomy.

Thus, for the aforementioned reasons, we believe that "it is reasonable to forecast that this technique may become a useful complementary imaging modality in anatomy-driven radiofrequency PV ablation" (1).

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http:dx.doi.org/10.1016/j.jcmg.2012.05.003

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