

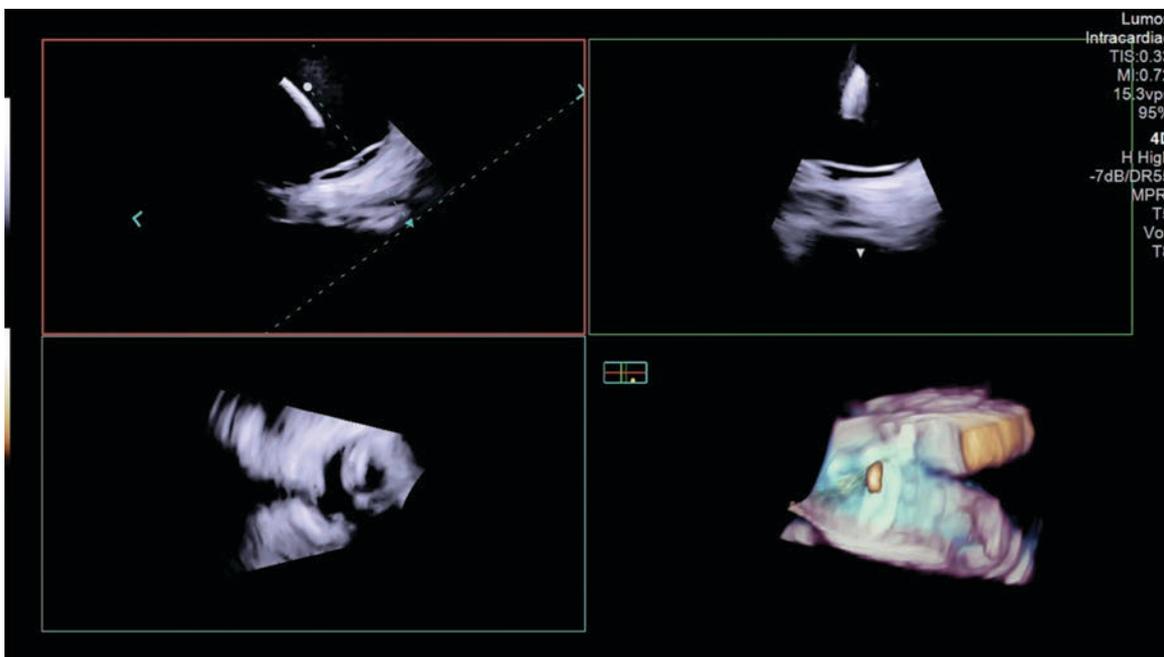
4D ICE-Guided Pulsed-Field Ablation

Images/courtesy Texas Cardiac Arrhythmia group, Austin, Texas

The catheter-based treatment known as pulsed-field ablation (PFA) is emerging as an innovative method of ablation for the treatment of atrial fibrillation. It creates precisely demarcated cardiac lesions that preserve tissue architecture; cell death is confirmed by

histological evidence of electroporation, which uses electrical fields to increase cell permeability. PFA can be augmented via four-dimensional (4D) intracardiac echocardiography (ICE) to guide catheter placement, verify tissue contact, and evaluate lesion formation. Additionally, 4D

ICE may help clinicians assess sufficient energy delivery to intended tissue and minimize the potential for hemolysis, or the rupturing of red blood cells. In this case, 4D ICE (AcuNav Lumos 4D ICE catheter, Siemens Healthineers) was used to perform PFA and provided detailed views of cardiac anatomy and visualization of tissue contact in multiple planes (Figures 1-2). AcuNav Lumos 4D ICE also guided the transeptal puncture and tenting with visualization of left atrial appendage in the far field (Figure 3) to confirm absence of thrombus. ■



Pulsed-field ablation (PFA) can be augmented via four-dimensional (4D) intracardiac echocardiography (ICE) to guide catheter placement, verify tissue contact, and evaluate lesion formation.

Figure 1. Visualization of the pulsed-field ablation (PFA) catheter making direct tissue contact in multiple planes in real time.



Figure 2. Confirmation of placement and myocardial tissue contact.



Figure 3. Intracardiac echocardiography (ICE)-guided transeptal puncture with visualization of left atrial appendage.