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LETTER TO THE EDITOR

Ultrasound-guided point-of-care ablation for atrial fibrillation in intensive care

Dear Editor,

Cha et al[1] reported short learning curve and low complication rate of radiofrequency catheter ablation for atrial fibrillation (AF) without using fluoroscopy based on a series of 30 cases. Their study confirms other reports of feasibility and safety to perform AF ablation using imaging guidance with intracaradiac echocardiography (ICE). ICE was previously reported to be vastly superior to fluoroscopy in defining cardiac anatomy, directing the position of the ablation catheter, identifying proper electrode-tissue contact, detecting electrode migration during ablation, recognizing pulmonary vein stenosis, detecting pericardial effusion, and visualizing microbubble and coagulum formation. This was further confirmed by a recent meta-analysis evaluating the use of imaging with real-time ICE during endocardial ablation showed improvements in efficiency compared with the use of traditional fluoroscopy, without compromising clinical effectiveness or safety[2]. Cha et al[1] discussed the avoidance of radiation hazard as an important advantage.

We believe that another important advantage of this innovative approach deserves better highlight. Utilization of ICE could become a game changer for point-of-care atrial ablation in critically ill population, particularly during current pandemic. The overall incidence of AF in patients in the intensive care unit is close to 6%, with the new onset of AF being a marker of poor short-term and long-term prognosis.[3] The reported incidence of AF in patients with sepsis or after cardiac valve surgery is disproportionately high (33% and 60%, respectively). It is important to acknowledge that in general, the causes of AF in intensive care are multifactorial and often rapidly reversible through simple measures or the passing of time. However, some patients with persistent AF and hemodynamic instability require pharmacological therapy and/or cardioversion, both of which are associated with iatrogenic risks, variable success rate, and frequent recurrence of AF. Despite growing knowledge of structural and electrical atrial remodeling during critical illness,[4] the use of catheter ablation in patients with AF who are in intensive care has not been adequately investigated. Which subgroups of intensive care patients could benefit in short or long term from early catheter ablation remains speculative.

The barriers to investigating the potential role of catheter ablation for AF in patients who are critically ill include the long procedural time and the need to transfer patients who have hemodynamic and/or respiratory instability or who are highly infectious to the catheterization laboratory. The latter has profound importance during SARS-CoV-2 pandemic, as intrahospital transfer of highly contagious patients presents major risk for other noninfected hospital patients, multiple staff, and the visitors.

Major technological advances improved ICE capabilities in quality of imaging and in ability to integrate with CARTOSOUND system. Recent introduction of commercially available, live, 3D ICE imaging with a wide-angle elevation displays the complete cardiac structures, including the pulmonary veins and intracardiac devices. Identified limitations of 3D ICE related to the spatial resolution[5] should not present problems for visualizing ablation catheters. Transesophageal echocardiography was used for point-of-care guidance of atrial ablation in AF, but the procedure presents additional risks associated with aerosol generation in patients suffering from coronavirus or other virulent respiratory pathology. Modern ICE technology offers viable alternative to transesophageal echocardiography, minimizing aerosol-related risks while maintaining comparable spatial and temporal resolution adequate for guiding ablation.

In summary, the investigation by Cha et al[1] opens new and exciting opportunities for expansion of zero-fluoroscopy approach to catheter ablation in AF. Short learning curve and shorter procedural time expands opportunities for long overdue research on ICE-guided catheter atrial ablation in subgroups of critically ill patients, particularly when pharmacological intervention fails to control persistent AF with hemodynamic instability. The study further expands available solutions for patients who present major epidemiological risk by adding point-of-care ICE-guided atrial ablation as an option of modern clinical armamentarium.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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