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Intracardiac ultrasound for esophageal anatomic assessment and localization during left atrial ablation for atrial fibrillation.

[Bunch TJ](#), [May HT](#), [Crandall BG](#), [Weiss JP](#), [Bair TL](#), [Osborn JS](#), [Anderson JL](#), [Muhlestein JB](#), [Lappe DL](#), [Johnson DL](#), [Day JD](#).

Source

Intermountain Heart Rhythm Specialists, Intermountain Medical Center, Murray, Utah 84107, USA. Thomas.bunch@imail.org

Abstract

BACKGROUND:

Esophageal injury during left atrial ablation is associated with a significant risk of mortality and morbidity. There are no validated approaches to reduce injury outside of avoidance, a strategy critically dependent on a precise understanding of the esophageal anatomy and location. Intracardiac ultrasound (ICE) can provide a real-time assessment of the esophagus during ablation. We hypothesized that ICE can accurately define esophageal anatomy and location to enhance avoidance strategies during ablation.

METHODS:

Fifty patients underwent atrial fibrillation (AF) ablation. The left atrium and pulmonary vein anatomies were rendered by traditional electroanatomic mapping (CARTO). A Navistar catheter within the esophagus was used to create a traditional electroanatomic esophageal anatomy. ICE imaging was used to create a second geometry of the esophagus. The traditional and ICE anatomies of the esophagus were compared and the greatest border dimensions used to avoid injury.

RESULTS:

The average age was 66 ± 10 years, 45% had persistent/longstanding persistent AF, and 18% had a prior AF ablation. The esophagus location was leftward in 17 (34%), midline in 22 (44%), and rightward in 11 (22%). Traditional esophagus and ICE imaging correlated within 1 cm in the greatest distance in 26 (52%) patients. Traditional imaging underestimated the esophageal location by >1 -1.5 cm in 9 (18%) and >1.5 cm in 15 (30%). In those with poor correlation (>1.5 cm), the most common cause was the presence of a hiatal hernia. Ablation energy delivery was performed outside the greatest esophagus anatomy borders. Of those with 12-month follow-up, 75% were AF/atrial

flutter free without antiarrhythmic drugs. No esophageal injuries were observed. One patient experienced a TIA greater than 6 months postablation.

CONCLUSION:

These data demonstrate that traditional means of mapping the esophagus using a catheter within the esophagus are insufficient and often grossly underestimate the actual anatomy. Imaging techniques that define the complete esophageal lumen should be considered to truly minimize esophageal injury risk.