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## **Esophageal imaging and strategies for avoiding injury during left atrial ablation for atrial fibrillation.**

[Ren JF](#)<sup>1</sup>, [Lin D](#), [Marchlinski FE](#), [Callans DJ](#), [Patel V](#).

### **[Author information](#)**

- <sup>1</sup>Division of Cardiovascular Medicine, Department of Medicine, University of Pennsylvania, School of Medicine, Philadelphia, Pennsylvania 19104, USA.  
[jianfren@yahoo.com](mailto:jianfren@yahoo.com)

### **Abstract**

#### **BACKGROUND:**

Part of the esophagus is contiguous to the posterior wall (PW) of the left atrium (LA). Esophageal injury has occurred during LA ablation for atrial fibrillation (AF). The ability to identify the esophagus and monitor LAPW lesions with intracardiac echocardiography (ICE) has not been documented.

#### **METHODS:**

We report an index case of atrioesophageal fistula as a complication of transcatheter ablation of AF. After the index case, we retrospectively reviewed morphologic changes with radiofrequency (RF) delivered at LAPW during pulmonary vein (PV) electrical isolation using an 8-mm tip electrode (up to 70 W at a maximum of 50-52 degrees C for 60 seconds) or Chilli catheter (up to 50 W at a maximum of 40 degrees C for 60 seconds). ICE did not influence lesion application. After the index case, RF power was reduced at areas adjacent to the esophagus (8 mm/30-50 W at 50 degrees C or Chilli/40 W at a maximum of 38 degrees C). Duration of RF, 10-30 seconds, was titrated based on accelerated bubble formation or early echogenic lesion formation.

#### **RESULTS:**

The longitudinal extent of the contiguous LAPW-esophageal wall (length 18-59 mm) was identified in all 152 patients (ages 56 +/- 10 years, 117 men). Preablation LAPW (2.8 +/- 0.7 mm) and contiguous anterior esophageal wall (3.0 +/- 0.8 mm) thickness were noted. A total of 6 +/- 4.9 lesions/patient were delivered to the LAPW contiguous to the esophagus. Echogenic LAPW thickness increased to 7.5 +/- 2.1 mm (vs. 2.8 +/- 0.5 mm preablation) before the index

case (n = 70 patients) and 4.7 +/- 1.6 mm (vs. 2.9 +/- 0.6 mm) after the index case (n = 67), with power reduction and titration of duration of energy delivery RF (P <.01) and PV isolation in all.

## **CONCLUSIONS:**

The LAPW-esophageal region can be identified and monitored with ICE imaging during ablation procedures. RF lesions to the LAPW in PV isolation can produce dramatic morphologic changes immediately adjacent to the anterior esophageal wall. A reduction in power amount and duration as described coupled with online lesion monitoring to further titrate duration (<30 seconds) of power delivery decreases the depth of lesion formation and limits the risk of esophageal involvement.

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