Real-time Localization of the Esophagus Using a Carto3 Mapping System During Radiofrequency Catheter Ablation of Atrial Fibrillation

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Introduction: Atrial-esophageal fistula has emerged as a life-threatening collateral damage as a result of esophageal thermal injury while ablating at the LA posterior wall. Esophageal localization is of potential value in avoiding lesion placement where the left atrium is juxtaposed to the esophagus.

Methods: Sixty-seven patients underwent pulmonary vein isolation. All the patients received general anesthesia and an endotracheal tube. A diagnostic electrophysiologic catheter [PentaRay Nav eco High-density Mapping Catheter] was inserted into the esophagus, and a virtual esophageal tube was created using an electroanatomic mapping system. In all cases, the catheter was advanced easily and satisfactory virtual esophageal images were created. The catheter remained in the esophagus until the end of each ablation procedure. Esophageal catheter location during and after the ablation was compared with the initial location.

Result: Under the monitor of Mapping3 system, areas of close proximity between the left atrium and esophagus were easily identified. Change in esophageal location was not observed. Identification of esophageal proximity to the pulmonary veins allowed for identification of high-risk cases. In such cases, the planned ablation routine was modified to avoid esophageal injury (42 of 67 patients).

Conclusion: Real-time localization of esophageal position using a Carto3 mapping system during atrial fibrillation ablation is safe, practical, and straightforward. (2) Among patients who receive general anesthesia, esophageal position appears to be static, suggesting that one initial virtual image is sufficient for the duration of an ablation procedure.