Additional data on protection of the esophagus during catheter ablation of atrial fibrillation

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Abstract

The excellent review by Houmsse and Daoud of techniques and methods utilized to protect the esophagus from injury during atrial fibrillation (AF) ablation appropriately concludes that considering the ease of use, minimal side effects, and low costs associated with esophageal protection devices, compelling evidence exists for use of esophageal protection as routine care for AF ablation. Some additional data are available which would warrant inclusion in further consideration of this topic. Three recent studies have demonstrated the inability of LET monitoring to protect the esophagus, whereas meta-analysis of three studies of manual cooling using direct liquid instillation suggests that this approach significantly reduced high-grade lesion formation (OR of 0.39, 95% CI 0.17 to 0.89). Moreover, three studies using a commercially available cooling device FDA cleared for thermal regulation have shown reductions in esophageal lesion severity without degradation in ablation efficacy.

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We enjoyed the review by Houmsse and Daoud of techniques and methods utilized to protect the esophagus from injury during atrial fibrillation (AF) ablation.[1] Their manuscript provides a valuable overview of an important topic, and appropriately concludes that considering the ease of use, minimal side effects, and low costs associated with esophageal protection devices, compelling evidence exists for use of esophageal protection as routine care for AF ablation. Some additional data are available which would warrant inclusion in further consideration of this topic.

Regarding the current standard of luminal esophageal temperature (LET) monitoring, in addition to the concerns over this approach raised by Houmsse and Daoud, abundant clinical data now exist and demonstrate the inability of LET monitoring to protect the esophagus. The OPERA study was a randomized controlled trial (RCT) of patients comparing single-sensor LET monitoring to controls (using no monitoring).[2] On endoscopy after ablation using standard parameters the authors found an 11% lesion rate with LET monitoring versus 9% without monitoring. The AI-HP ESO II study utilized ablation-index guided high-power and found two lesions in the single-sensor LET monitored group versus one in the unmonitored controls.[3]

Grosse Meininghaus et al. utilized multi-sensor LET monitoring in an RCT and found a 14% injury rate with multi-sensor LET monitoring versus a 5% rate with no LET monitoring, with the most severe lesion found in the unmonitored group.[4]

Regarding active cooling using manual cold liquid instillation, in addition to the study cited by Houmsse and Daoud, two other studies have been published comparing this method to standard LET monitoring.[5,6] A meta-analysis of all three of these studies found that this approach significantly reduced high-grade lesion formation (OR of 0.39, 95% CI 0.17 to 0.89), suggesting that even with a low-capacity thermal extraction technique, the severity of lesions resulting from RF ablation is reduced.[7]

Regarding active cooling utilizing a dedicated device, three studies have been completed. The device used in these studies is commercially available and is FDA cleared as a thermal regulating device intended to connect to an external heat exchanger to control patient temperature, allow enteral administration of fluids, and provide gastric decompression and suctioning for a duration of up to 72 hours. In addition to the IMPACT study cited by Houmsse and Daoud, which found an 83% reduction in esophageal lesion formation using this device, two prior pilot studies have been performed.[8-10] Clark et al. performed the first investigation, comparing manual liquid instillation to the active cooling device in a small pilot RCT, and found that the extent of esophageal injury was less severe with the active cooling device.[9] Tschabrunn et al. performed a pilot RCT comparing single-sensor LET monitoring to the active cooling device and found that severe lesion reduction was 67% with active cooling despite adjunctive posterior wall isolation being performed more frequently in patients randomized to active cooling.[10]

We believe these additional studies further support the conclusions of Houmsse and Daoud, and with growing interest in this topic and an increasing focus on improving overall procedural safety, we expect ongoing study in this area.

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