Abstract: P1461

Esophageal cooling for prevention of thermal lesions during left atrial ablation procedures: first in man case series

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Topic(s):
Rhythm Control, Catheter Ablation

Citation:
Aims: Atrioesophageal fistulas are a rare but dramatic complication related to radiofrequency ablation. Cooling of the esophagus during energy delivery may help to avoid thermal esophageal lesions and therefore the development of atrioesophageal fistulas.

Methods: A device capable of esophageal cooling was used in patients undergoing left atrial RF-ablation procedures. The device is a silicone tube which is inserted into the esophagus. An external cooler heater unit circulates cold or warm water inside the tube. Procedural data and outcomes as well as esophageal and body temperature were measured. Endoscopy to detect thermal lesions of the esophagus was systematically performed between 24 and 48 hours after the ablation procedure. Endoscopy findings from patients who had undergone left atrial ablation procedures without esophageal cooling served as control.

Results: A cohort of 10 patients received a left atrial ablation procedure with an esophageal cooling device in place. All procedures were performed in sedation and were completed successfully. There were no relevant changes in body temperature. Intensified cooling during ablation on the left atrial posterior wall prevented an increase in esophageal temperature over 39°C in 7 out of 10 patients. Post-procedural endoscopy revealed esophageal thermal lesions in 2 patients (compared to 6 out of 20 patients). Only in one of these patients a rise in esophageal temperature above 39°C had been detected during the ablation procedure. No mechanical injury to the esophageal wall caused by the cooling device was found.

Conclusion: The use of an esophageal cooling device during radiofrequency ablation for left atrial ablation procedures is feasible and successfully reduces the luminal esophageal temperature. All the same, thermal lesions cannot be completely avoided but were less frequent than in the control group. Larger, randomized trials are warranted to evaluate the effect of esophageal cooling during ablation procedures and to determine the required intensity of cooling.