Adenosine-induced atrial fibrillation originated from right atrial appendage

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Introduction: Precise identification of a non-pulmonary vein (PV) trigger can sometimes be challenging because of the difficulty in inducing the trigger. We report a case of atrial fibrillation (AF) arising from right atrial appendage (RAA), which was reproducibly induced with adenosine.

Methods: A 51-year-old man with symptomatic paroxysmal AF underwent PV isolation, superior vena cava (SVC) isolation, and cavo-tricuspid isthmus (CTI) ablation. However, he began having recurrent symptoms with AF documented. Second procedure was thus performed. Clockwise CTI block was confirmed and the 4 PVs remained electrically isolated. SVC reconnection was identified and thus the SVC was re-isolated. Low voltage area was not evident in the right and left atria. AF was induced by bolus intravenous injection of adenosine triphosphate (ATP) (figure A). The initiation of AF occurred immediately after atrioventricular block. After DC cardioversion, a total of 9 ATP injections was repeated to confirm reproducibility of this finding and to determine the site of earliest activation (EA).

Result: As a result, all the injections successfully triggered AF. The activation map using multi-electrode catheter identified EA site in the RAA (figure B), where the pre-potential (arrows in figure A) was observed. Moreover, activation frequency in the RAA (daggers in figure A) was higher than that in the coronary sinus (CS) (asterisks in figure A). Radiofrequency application at the EA site eliminated the RAA trigger.

Conclusion: In our patient, adenosine was able to induce the RAA trigger with 100% reproducibility. The RAA may have played a role not only in initiating but also in maintaining AF.