Characterization of a Rapid Regular Driver of Persistent Atrial Fibrillation

Haris Muhammad MD, Aparna Iyer MD, Dmitry Nemirovsky,MD, David Y Feigenblum MD, Grant R Simons MD

BACKGROUND

Although non-pulmonary vein (PV) foci are well described as triggers of atrial fibrillation (AF), they are poorly understood drivers of persistent AF. Proposed mechanisms of such drivers include rotors, rapid foci, and areas of slow conduction. There is a paucity of published data characterizing rapidly firing non - PV drivers of AF.

CASE

An 80-year-old female status post PV isolation for paroxysmal AF six years ago with persistent AF underwent redo catheter ablation.

RESULT

After catheter insertion, cardioversion was performed. Catheter manipulation in the left atrial dome repeatedly initiated AF; non – fluoroscopic mapping of the PV antra could not be completed in sinus rhythm due to incessant AF. After multiple cardioversions, mapping was performed during AF. A site in the high mid dome displayed a regular electrogram with cycle length 154 msec (figure). Radiofrequency ablation was performed at this site at 40 Watts for 13 seconds. AF terminated two seconds after termination of current delivery and was subsequently non inducible despite aggressive pacing and catheter manipulation, which was a dramatic change from baseline, during which any manipulation in the dome consistently induced AF.

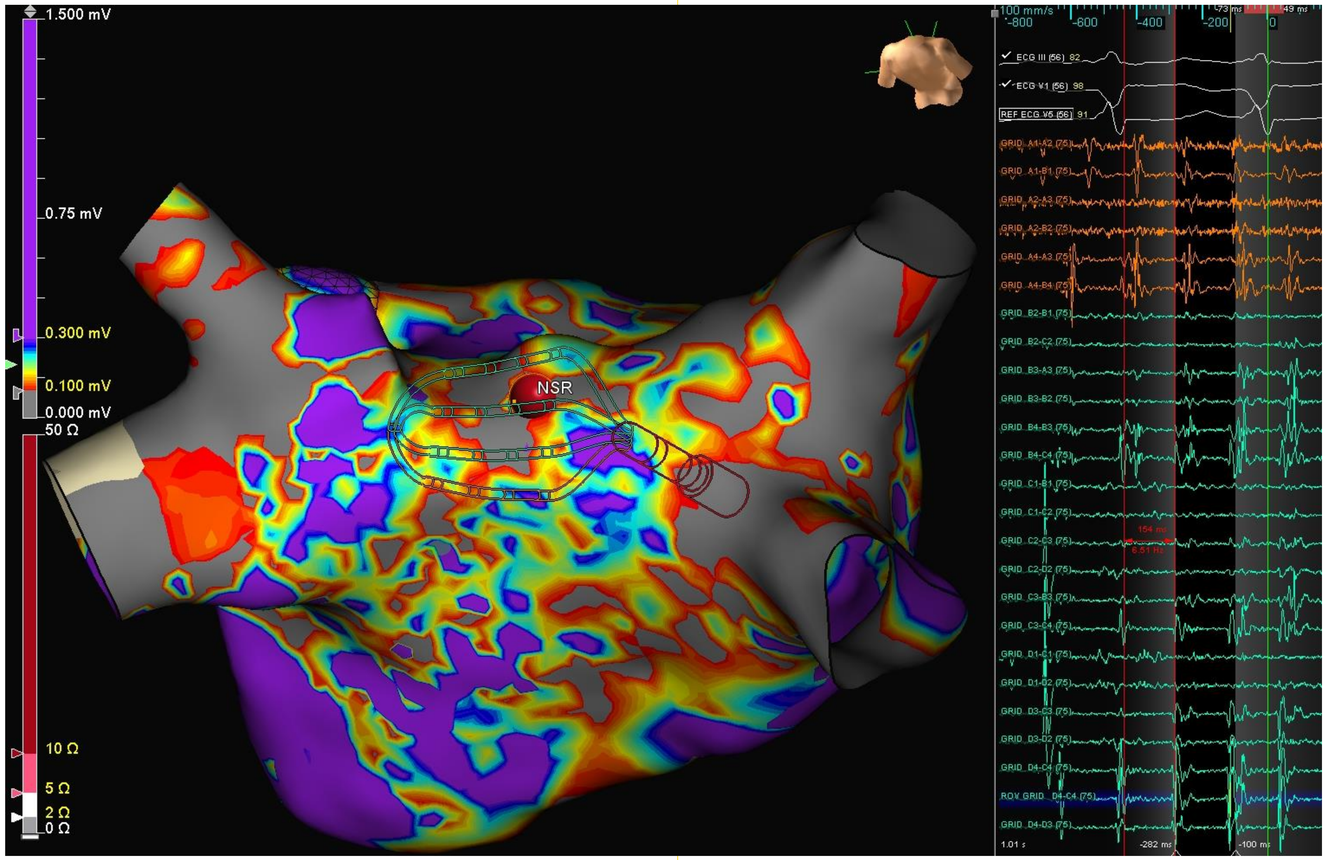

Figure: Left panel shows Voltage map with successful ablation site, characterized by a red lesion tag, and “NSR”. Interestingly, this site was at an apparent scar border. Right panel shows electrogram at that site, which was regular and extremely rapid with cycle length 154 msec.

CONCLUSION

This case demonstrates an extremely rapid and regular single driver of persistent AF and characterizes the electrogram at the successful ablation site. As there is a paucity of prior reports of electrograms at such rapid sites, this finding adds to our knowledge of such drivers.

The anatomic location and late termination are suggestive of involvement of the subepicardium, perhaps the septopulmonary bundle, which has recently been implicated in the maintenance of AF in several anatomic studies.

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