Characterization of conduction gaps at the pulmonary vein antra by omnipolar voltage mapping

Merino JL.[1]; Kim S.[2]; Castrejon S.[1]; Relan J.[2]; Sanroman-Junquera M.[2]; Martinez-Cossiani M.[1]; Escobar C.[1]; Carton A.[1]

[1]University Hospital La Paz, Madrid, Spain
[2]Abbott, Sant Paul, Minessota, United States of America

Funding Acknowledgements: Type of funding sources: Private grant(s) and/or Sponsorship. Main funding source(s): Abbott provided some software to perform special maps

Introduction: Voltage mapping of atrial tissue may be influenced by the direction of the activation front. Omnipolar electrograms may result in better characterization of the atrial tissue. However, little is known about characterization of the pulmonary vein (PV) antra with omnipolar mapping in patients with recurrent atrial fibrillation (AF) following PV isolation (PVI).

Purpose: To study differences in voltage between regions with (Gap) and without (No-Gap) conduction recurrence at the PV antra by both omnipolar and conventional bipolar mapping in redo PVI procedures.

Methods: Single centre prospective study of consecutive patients who underwent a redo PVI procedure for AF ablation. Activation and voltage bipolar maps were developed on a electroanatomical system (Ensite Precision) by a steerable catheter with a 16 grid-patterned electrode configuration (HD-Grid) during coronary sinus pacing at both 500 and 300 ms. Precise location of conduction gaps in the PV antra was attempted by atrial and PV pacing. Only conduction gaps that were ablated by ≤3 focal radiofrequency applications were included in the analysis. Electrograms recorded within 1 cm at both sides of the RF application site were considered related to the gap region. Off-line omnipolar voltage maps were developed with a dedicated experimental software after the procedure .

Results: 11 patients were included in the study and 18 gaps were found in 9 patients. 6762 (2688 Gap and 4074 No-Gap) electrograms were analyzed. Compared with No-Gap PV regions, Gap regions showed significantly ($P < 0.0001$) higher voltages by omnipolar mapping (0.3 ± 0.6 mV vs 1.1 ± 1.4 mV) and by absolute (0.2 ± 0.5 mV vs 0.8 ± 1.2 mV), grid-along (0.3 ± 0.5 mV vs 0.8 ± 1.2 mV) and grid-across (0.3 ± 0.5 mV vs 0.8 ± 1.1 mV) bipolar mapping. Omnipolar mapping resulted in higher voltage electrograms when compared with absolute bipole, longitudinal and horizontal bipolar electrograms ($P < 0.0001$). ROC curves (figure) to differentiate between Gap and No-Gap regions were slightly better for omnipolar electrograms (AUC 0.79) than for conventional grid -along or grid-across bipolar mapping (AUC 0.76 and 0.77) with the best discrimination value of 0.3 and 0.2 mV respectively. Conclusion: There are significant differences in voltage between conduction Gap and No-Gap regions at the PV antra which are more apparent with omnipolar than with conventional bipolar mapping. 0.3 mV and 0.2 mV values are the best to differentiate between PV conduction Gap and No-Gap regions with ominpolar and conventional mapping respectively

Downloaded from https://academic.oup.com/europace/article/23/Supplement_3/euab116.256/6283334 by guest on 20 April 2024