

A novel ventricular map of electrograms duration as a method to identify areas of slow conduction during ablation of ventricular tachycardia

Rossi P.¹; Cauti FM.¹; Polselli M.¹; Iaia L.¹; Fanti V.²; Niscola M.²; Andreoli C.³; Calore F.²; Bianchi S.¹

¹S.Giovanni Calibita Fatebenefratelli Hospital, Rome, Italy

²Abbott Italy, Milano, Italy

³FOLIGNO General Hospital, Foligno, Italy

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Background – Wave front inhomogeneous propagation is crucial for reentry circuit generation. Bipolar EGM duration is indicative of local conduction delay and may identify areas of low conduction as a functional substrate. This study aimed to create a map of EGM duration during the VT (VEDUM Map) to identify the area of the slowest conduction and to verify if RF delivery at this area allows to rapidly interrupt the VT.

Methods – 24 high-density VTs maps (21 patients) were analyzed. Activation maps and voltage maps during SR were performed. An offline remap confirmed with MathLab software was customized to visualize the longest duration electrogram during VT.

Results – All of the VTs were interrupted during the first RF delivery (mean time 7.3 ± 5.4 sec (range 3-25 sec)) at the area with the longest EGM duration (212 ± 47 ms (range 113-330 ms)). In 9 pts (37,5%) the longest EGM was located at the entrance or exit area of the activation maps while in 5 pts (21%) the EGM covered the full diastolic phase. Finally, in 10 pts the longest EGM occurred in the mid-exit-diastolic phase.

Conclusions - A novel Ventricular map of Electrograms DURATION (VEDUM Map) is highly accurate in defining a conductive vulnerable zone of the VT circuit. The longest EGM duration within the isthmus is highly predictive of rapid VT termination.

	Quantitative variables			Qualitative variables			
	Mean	Median	Standard Deviation				
Age	71	73	8.40				
BMI	26.6	24.5	4.02				
LV EDV	163	154	42.7				
LV EDD	61.2	62	9.9				
LV EF	38.7	36	9.74				
VT cycle length (TCL)	355	375	56.4				
EGM max. duration in VT	212	208	47				
EGM max dur / TCL	58.2	60.5	12				
Maximum EGM duration localization in CL				Proto = 12.5%	Meso = 33.3%	Tele = 25%	Full = 20.8%
Myocardium voltage characteristics in VEDUM EGM				Healthy = 25%	Transition = 20.8%	Scar = 41.7%	
Critical Isthmus area	12.3	10	7.3				
VT Interruption during RF				Yes = 79.2%	No = 20.8%		
Time (seconds) to interruption	7	6	5				
Access type				Endo = 58.3%	Epi = 29.2%		

Clinical and procedural data

Abstract Figure.

