Universitat Pompeu Fabra Barcelona

Automatic identification of the arrhythmogenic substrate of scar-related ventricular tachycardia from electroanatomical electrical mapping data

TEC-0136/P-0039

The automatic algorithm identifies the presence or absence of the delayed component for voltage mapping.

BACKGROUND

Voltage mapping is the technique used for assessing the arrhythmogenic substrate in scar-related ventricular tachycardia (VTs). The presence of slow conducting channels (CCs) within the scar (small bundles of viable myocardium) allows the induction and perpetuation of those VTs. The entrances of those slow CCs are the target for ablation. Nowadays, eletroanatomical mapping (EAM) systems do not have advance signal processing for identifying the characteristics of such arrhythmogenic substrate, i.e. those slow CCs, during voltage mapping. Such identification is made manually during the procedure.

THE TECHNOLOGY

The automatic algorithm identify the presence or absence of the delayed component (slow CC activation) for voltage mapping. It provides automatic tags for identifying the slow CC entrances considered the target for ablation. It also associates the correct bipolar voltage to the electroanatomical voltage map in order to correct delineate the scar and identify the slow CC locations.
It is based on a complete solution that also is ready for performing activation mapping of more stable VTs like those with focal origin.

ADVANTAGES

- Automatic identification of the existence of delayed components in the electrical signals (EGMs).
- Automatic tagging of EGMs in order to provide information to the electrophysiologist at a glance of where to perform ablation during scar- related VT voltage mapping.
- Removes uncertainties in scar delineation due to the masking effects of healthy myocardium surrounding the scar (i.e. far-field activity).
- Automation reduces workload of electrophysiologist and companion system operators in performing this identification, especially where multi electrode mapping catheters are used.
- Automation reduces observer dependent measurements and provides reproducible outcomes.
- Automation helps to identify subclinical VTs that during normal procedures could not be explored and thus help to reduce recurrences.
- The automatic algorithm is part of a more complete solution that provides also an activation mapping framework for stable VTs.
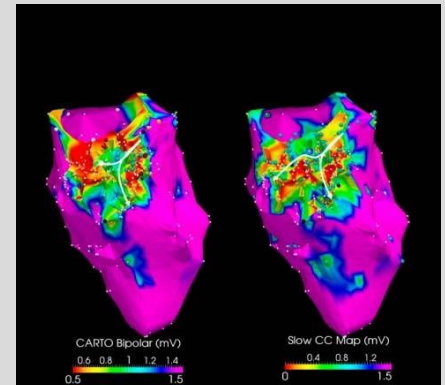
INTELLECTUAL PROPERTY

Patent application filed.
Technology ownership shared among Universidad de Zaragoza (40%), Hospital Clinic de Barcelona (40%) and Universitat Pompeu Fabra (20%).

MARKET OPPORTUNITY

Global heart mapping systems market historical CAGR of 11.5% from 2008 to 2014.

COMMERCIAL OPPORTUNITY
Technology available for licensing with technical cooperation

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KEYWORDS
EGM, tachycardia, slow conducting channels, voltage mapping

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