Rapid acquisition of high-resolution electroanatomical maps using a novel multielectrode mapping system

Leon M. Ptaszek, MD, PhD i; Fadi Chalhoub, MD ii; Francesco Perna, MD iii; Roy Beinart, MD iv; Conor D. Barrett, MD, BCH, BAO, BMedSc iv; Stephan B. Danik, MD v; E. Kevin Heist, MD, PhD vi; Jeremy N. Ruskin, MD vi; Moussa Mansour, MD vi

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Introduction
Researchers tested the feasibility of using a novel, multielectrode catheter – the Rhythmia™ Mapping System from Boston Scientific – to map the right atrium (RA) and the left ventricle (LV).

Methods
Electroanatomical mapping of the right atrium and the left ventricle during both sinus and paced rhythm were performed in five swine using a conventional mapping catheter and the IntellaMap Orion™ High-Resolution Mapping Catheter.

The Rhythmia Mapping System uses an 8F deflectable catheter with a mini-basket (1.8 cm diameter) of 8 splines of 8 electrodes (total 64 electrodes, 2.5 mm spacing). The system automatically generates chamber geometry and a HR activation map using electrograms (EGMs) recorded within 5 mm of the chamber surface. In addition, it automatically acquires EGM and location information based on EGM stability and respiration phase.

Results

<table>
<thead>
<tr>
<th></th>
<th>Average map acquisition time</th>
<th>Average points per map</th>
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</thead>
<tbody>
<tr>
<td><strong>Multielectrode catheter</strong></td>
<td></td>
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</tr>
<tr>
<td>with continuous data collection</td>
<td>5.2 to 9.5 minutes</td>
<td>2,753 to 3,566</td>
</tr>
<tr>
<td><strong>Multielectrode catheter</strong></td>
<td></td>
<td></td>
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<tr>
<td>with manual data collection</td>
<td>11.4 to 18.1 minutes</td>
<td>870 to 1,038</td>
</tr>
<tr>
<td><strong>Conventional, single-electrode catheter</strong></td>
<td>28.6 to 32.2 minutes</td>
<td>120 to 148</td>
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</tbody>
</table>

Conclusion
The multielectrode catheter is feasible for mapping the LV and RA. It facilitated acquisition of electroanatomical data more rapidly than a conventional mapping catheter. This resulted in shorter map acquisition times and higher-density electroanatomical maps in the LV and RA.

This study was conducted with a small sample size in normal animal hearts in sinus rhythm. It also only look at the right atrium and ventricle. Additional studies should be done with abnormal hearts, in tachycardia, and in additional chambers of the heart. It also was only completed with the IntellaMap Orion catheter being used in conjunction with the Rhythmia system. Therefore no testing was completed to compare different competitive mapping catheters.

TO READ THE FULL ARTICLE, CLICK HERE http://rd.springer.com/article/10.1007%2Fs10840-012-9733-y
RHYTHMIA® MAPPING SYSTEM INTENDED USES/INDICATIONS FOR USE

The Rhythmia Mapping System is intended for use in catheter-based medical procedures. It allows real-time visualization of intracardiac catheters and display of cardiac signals, which may assist in the diagnosis and treatment of cardiac arrhythmias.

CONTRAINdications

There are no known contraindications. Warnings and Precautions

The use of the Rhythmia Mapping System may be associated with certain risks and potential adverse events. It is important to use it in conjunction with the patient's clinical condition and to follow the manufacturer's recommendations and instructions for use.

POTENTIAL ADVERSE EVENTS

Potential adverse events associated with the use of the Rhythmia Mapping System include:

- Vasovagal reactions.

Federal law (USA) restricts this device to sale by or on the order of a physician. Rx only. Prior to use, please see the complete "Directions for Use" for more information on Indications, Contraindications, Warnings, Precautions, Adverse Events, and Operator's Instructions.

INTELLAMAP ORION™ High Resolution Mapping Catheter INDICATIONS FOR USE

The Intellamap Orion High Resolution Mapping Catheter is intended for electrophysiological mapping (recording or stimulating) of the cardiac structures of the heart. CONTRAINDICATIONS

The Intellamap Orion Catheter should not be used in patients who are candidates for transcatheter vascular procedures. Patients with a hypercoagulable state or who cannot tolerate heparin-based anticoagulation therapy. Patients with prosthetic or stenotic valves, in the chamber where the prosthetic or stenotic valve resides. Patients with active systemic infection. Pediatric patients. Pregnant and/or nursing patients.

The Intellamap Orion Catheter should not be used in patients who are not candidates for transvascular catheter procedures. Patients with a hypercoagulable state or who cannot tolerate heparin anticoagulation therapy. Patients with prosthetic or stenotic valves, in the chamber where the prosthetic or stenotic valve resides. Patients with active systemic infection. Pediatric patients. Pregnant and/or nursing patients.

WARNINGS

To avoid cardiac damage, do not use excessive force when manipulating the catheter. Potentially serious adverse events, such as cardiac perforation and arrhythmias, may occur. Potentially serious adverse events, such as cardiac perforation and arrhythmias, may occur.

POTENTIAL ADVERSE EVENTS

Potential adverse events include:

- Vasovagal reactions.

Rhythm Management

300 Boston Scientific Way
Marlborough, MA 01752-1234
www.bostonscientific.com

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