Ablation of Atrial and Dual-loop Ventricular Tachycardia in a Patient with Congenital Heart Defect: Guided by the Rhythmia™ Electroanatomic Mapping Solution

Case and Images provided courtesy of Dr. Tom Wong
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Background

• 54 Year Old Male

• Referred after recurrent palpitations and electrocardiogram (ECG) documentation of both ‘narrow’ and broad complex tachycardias

• Termination of tachycardia required both intravenous amiodarone and DC cardioversion

• Peri-operative myocardial infarction

• Ross Procedure performed by Mr. Donald Ross at the Royal Brompton Hospital.

• Uncorrected right coronary artery fistula to the right atrium
EP Study
Ventricular Tachycardia (VT)
VT Activation Map, with Voltage Map during atrial pacing 0.2-0.4mV. LV access via retrograde Aortic approach.
VT Activation Map
Voltage Scaling
VT Activation and Voltage Map
VT Propagation with Voltage Map
Ablation of VT Isthmus
AT1 300ms Cycle Length
Concealed Entrainment from CTI with IntellaMap Orion

300ms
Atrial Tachycardia Propagation

AT2 – Re-entry around lateral wall

AT1 – Typical CCW RA Flutter
AT1 and AT2 Propogation

AT2 – Re-entry around lateral wall
AT1 – Typical CCW RA Flutter
Post CTI Ablation - AT2 300ms Cycle Length with Different P Wave Morphology from AT1
Long Post Pacing Interval with Entrainment from CS proximal
Concealed entrainment from posterior lateral wall

300ms
AT2 Propagation
Rhythmia™ Mapping System - Indications for Use, Contraindications, Warnings, Precautions

INDICATIONS FOR USE The Rhythmia Mapping System and accessories are indicated for catheter-based atrial and ventricular mapping. The mapping system allows real-time visualization of intracardiac catheters as well as display of cardiac maps in a number of different formats. The acquired patient signals, including body surface ECG and intracardiac electrograms, may also be recorded and displayed on the system’s display screen.

CONTRAINDICATIONS There are no known contraindications. WARNINGS (abbreviated) General: Use the Rhythmia Mapping System as intended, and according to the instructions that accompany the device. Failure to follow system warnings, precautions, and instructions may cause equipment damage, system malfunction, or harm to the patient or user. All devices that are connected to the Rhythmia Mapping System must meet IEC 60601-1 requirements and any other relevant safety standards. When connected to other devices, the combined systems’ configuration must meet the IEC 60601-1-1 safety standards. The use of the Rhythmia™ Mapping System with accessories and devices that do not comply with relevant standards may reduce the safety of the system, cause equipment damage or system malfunction, or harm to the patient or user. Only stimulators that are certified for IEC 60601 should be used with the Rhythmia Mapping System. Do not connect life-sustaining pacing through the Rhythmia Mapping System. The system is not intended to provide life-sustaining therapy and should not be used as such. In case of need for emergency pacing, or any failure of stimulator routing, directly connect the desired paced channel to the stimulator. The Rhythmia Mapping System is only designed to route the stimulation signal to the desired channel. To start or stop stimulation, always use the controls on the external stimulator. Use the Rhythmia Mapping System only with one of the following RF ablation generators: Maestro®, Stockert™, or IBI™. Do not use the system with other RF ablation generators. Compatibility with other RF ablation generators has not been demonstrated. PRECAUTIONS (abbreviated) Body Surface Electrodes: Use care when attaching the body surface electrodes to lead connectors. To minimize the risk of electric shock, make sure that electrodes and lead connectors do not contact one another or contact ground. To prevent low quality signals from body surface electrodes, properly prepare the skin prior to attaching the electrodes. Do not use excessive gel as this may lead to shorts between different electrodes. During the procedure: To ensure correct clinical decisions, use fluoroscopy, ultrasound, pace mapping or other visualization techniques to verify mapping results and catheter position. Always compare the anatomical map to the patient’s expected anatomy.

IntellaMap Orion™ High-Resolution Mapping Catheter - Indications for Use, Contraindications, Warnings, Precautions, Potential Adverse Events

INDICATIONS FOR USE The IntellaMap Orion High-Resolution Mapping Catheter is indicated for electrophysiological mapping (recording or stimulating only) of the cardiac structures of the heart. CONTRAINDICATIONS 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 reside. Patients with active systemic infection. Pediatric patients. Pregnant and/or nursing patients. Patients with any other condition where catheter manipulation may not be safe. The IntellaMap Orion Catheter should not be used for radio frequency (RF) ablation. The IntellaMap Orion Catheter should not be used inside an MRI machine. WARNINGS Keep the connector dry; wet connector pins may affect performance. Do not allow the handle or cabling to be immersed in fluid. This catheter is intended for single patient use only. Do not reuse or re-sterilize. Resterilization may damage the device and reuse may increase the risk of cross contamination. Do not use the catheter to deliver ablation therapy. Do not expose the catheter to alcohol or other cleaning solvents. Do not operate the catheter against resistance. If resistance is felt during advancement, retraction, articulation, deployment or un-deployment, stop and evaluate device location under fluoroscopy. Do not advance or retract the catheter through a sheath when deployed or articulated. In order to reduce the risk of clot formation: Maintain an activated clotting time (ACT) of greater than 300 sec. at all times during use of the catheter, and continuously flush the electrode array with saline via the irrigation port at the proximal end. Do not use the catheter with equipment (such as stimulators or recording systems) that is not isolated. PRECAUTIONS Store in a cool, dry place. Do not use if the sterile package is open or damaged. Do not use the device if the use-by-date has passed. To avoid cardiac damage, do not use excessive force when manipulating the catheter in vivo. Specifically, use caution when maneuvering while undeployed. Note that mapping and recording data do not require the use of force on the tissue. Always undeploy the catheter prior to removal from the patient. Use visualization (such as fluoroscopy) to verify undeployment. Always move the articulation control lever to its neutral position to straighten the catheter prior to removal from the patient. Only use guiding sheaths with curves that allow passage of the catheter without using excessive force. When used with a steerable guiding introducer sheath: Ensure under fluoroscopy that the guiding introducer sheath distal end is straight or, if necessary, only minimally curved prior to advancing or retracting the catheter through the sheath. Do not articulate the sheath while the catheter array is inside the articulating section.

deploy or articulate the catheter while the distal end is inside a sheath. Do not apply RF energy on an ablation catheter that is in direct contact with the electrodes on the IntellaMap Orion Catheter. To prevent entanglement, use care when using the catheter in the proximity of other catheters. When pacing, verify desired waveform is present. Prior to insertion into vasculature, ensure removal of all air from the catheter lumen; use a pressurized saline bag to flush saline through the catheter shaft and electrode array. Remove the catheter in case of any observed malfunction. Federal Law (U.S.A.) restricts the sale of this device by or on the order of a physician only. POTENTIAL ADVERSE EVENTS Serious adverse events have been reported in the literature in relation to cardiac catheterization including: stroke, cardiac tamponade, perforation, myocardial infarction, pulmonary embolism and death. Complications reported included also (in alphabetical order): air embolism, arrhythmia, AV fistula, hematomas, hemothorax, pneumothorax, pseudoaneurysm, thromboembolism, valvular damage, vascular bleeding and vasovagal reactions. CAUTION Federal Law (USA) restricts this device to sale by or on the order of a physician. Carefully read all instructions prior to use. Observe all contraindications, warnings, and precautions noted in these instructions. Failure to do so may result in patient complications. Boston Scientific relies on the physician to determine, assess, and communicate to each patient all foreseeable risks of the procedure.