PO-621-03

DUAL-CHAMBER LEADLESS PACEMAKER ENABLES ROBUST ATRIOVENTRICULAR SYNCHRONY IN VARIOUS POSTURES AND PACING CONFIGURATIONS

Reinoud Knops MD, PhD; Daniel J. Cantillon MD, FHRS; Petr Neuzil MD; Rajesh S. Banker; Mayer Rashian MD, FHRS, CCD; Rahul N. Doshi MD, FHRS; Daniel Booth MEng; Weiqun Yang MS, MSBME; Aditya Goli; Nima Badie PhD; David Ligon BS, MSBME; MSBME and Matthew G. Fisher PhD

Background: Dual-chamber leadless (DDD) indicated patients require atrioventricular (AV) synchronous pacing involving beat-by-beat, wireless communication between devices. Implant-to-implant (i2i™) communication enables true AV synchrony. At each paced or sensed event, one leadless pacemaker (LP) communicates wirelessly with the other. Changes in posture could affect orientation of the LPs and thereby potentially impact i2i communication.

Objective: Demonstrate the performance of a novel, beat-by-beat i2i communication modality for synchronous, dual-chamber pacing using 2 implanted LPs in the right atrium (RA) and right ventricle (RV) while subjects assume various postures.

Methods: A preclinical feasibility study was performed with ovine, and AV synchrony was evaluated in various postures and pacing configurations. RA and RV Averix™ DR LPs (Abbott, Abbott Park, IL) were implanted in 7 subjects: 4 with AV block and 3 without AV block. Inclusion of AV block subjects allowed for normal paced and sensed AV delays when delivering ventricular pacing (VP). After at least 1 month post-implant, each subject received pacing in 2 configurations: either AP (atrial pace)-VP and AS (atrial sense)-VP or AP-VS (ventricular sense) and AS-VS. Diagnostic data was analyzed following 5-min periods of on-demand testing for which each ovine assumed a series of postures (left and right laterals, supine, and standing). i2i communication success rate was used as a surrogate metric to approximate AV synchrony.

Results: The overall i2i communication success rate was 98.6±1.6%. The i2i success rates by posture were equivalent (P=0.19): 98.9±1.7% (left lateral), 99.9±0.0% (right lateral), 98.1±4.2% (supine), and 97.3±4.2% (standing). Heart rate was on average 98±21bpm (range: 30-170). The i2i success rates by pacing configuration were equivalent (P=0.76): 98.4±3.4% (AP-VP), 98.8±1.6% (AP-VS), 99.4±0.7% (AS-VP), and 97.9±2.7% (AS-VS). Of all instances when i2i communication was lost, 99.4% were shorter than 6 sec—yet ventricular pacing was always maintained, if needed, at the current rate. Postural changes and pacing configurations did not significantly impact i2i success rates.

Conclusion: True dual-chamber (DDD) leadless pacing is feasible whereby AV synchronous i2i communication is maintained beat-by-beat.

PO-621-04

DIFFERENTIAL IMPACT OF EARLY AND LATE VENTRICULAR TACHYCARDIA IN PATIENTS WITH CONTINUOUS FLOW LEFT VENTRICULAR ASSIST DEVICES: A META-ANALYSIS

Rakesh Gopinathannair MA, MD, FHRS; Krishna Akella BA, DO; Naga Venkata Krishna Chand Potheni MD;