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VECTOR-HF: The first human experience with the V-LAP, a wireless left atrial pressure monitoring system for patients with heart failure

H. Sievert[1], C. Di Mario[2], L. Perl[3], D. Meerkin[4], W.T. Abraham[5]

[1]Frankfurt, Germany & Anglia Ruskin University, CardioVascular Center Frankfurt, Frankfurt, Germany; [2]Careggi University Hospital (AOUC), Division of Cardiology, Florence, Italy; [3]Rabin Medical Center, Petah Tikva, Israel; [4]Padeh-Poriya Medical Center, Cardiology, Tiberius, Israel; [5]The Ohio State University, Division of Cardiology, Columbus, United States of America

On behalf of VECTOR-HF

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Background/Introduction: Invasive pressure-guided therapy has been shown to improve outcomes in patients with heart failure (HF). Thus far, only right-sided pressure sensors have shown clinical efficacy and safety. The Vectorious Medical Technologies V-LAP™ is a novel battery-less and wireless left-sided pressure monitoring system, directly assessing left-atrial pressure (LAP) in an ambulatory setting. In pre-clinical studies, it was shown to enable accurate and safe measurement of LAP. We hereby describe the first human experience with the device.

Methods: The V-LAP left atrial monitoring systEm for patients with Chronic sysTOlic and diastolic congestive heart failuRe first-in-human (VECTOR) study is a prospective, multicenter, single arm, open-label clinical trial to assess the safety, performance and usability of the V-LAP system in patients with heart failure. The V-LAP™ wireless sensor is implanted using a trans-septal access, under angiographic and echocardiographic guidance. The system includes an external unit, which both powers the implant and collects data via radio frequency communication upon activation, designed to be operated on a daily basis. We hereby describe the first cases, implanted in the CardioVascular Center, in Frankfurt, Germany.

Results: At this point in time, there have been two successful implantations of the V-LAP™, performed in two NYHA Class III patients. Both were admitted repeatedly for exacerbations of HF, and demonstrated elevated NT-ProBNP levels. They were therefore considered appropriate candidates for the monitoring system, to enable optimal medical therapy. The procedure was performed in a trans-femoral, trans-septal fashion, under mild sedation, with a successful implantation of a V-LAP™, and calibration for pressure measurement. There were no complications, data showed accurate LAP reading (Figure 1).

Conclusions: In the first-in-human cases, the implantation of the novel wireless left atrial pressure sensor V-LAP™ was feasible, safe, and showed good accuracy and precision. We now await both short and long-term efficacy and safety outcomes of the device, with the hopes of optimizing care according to ambulatory LAP data for patients with HF.