

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Heart Rate and AV delay modify left ventricular filling vortex properties¹ JUAN C. DEL ALAMO, MAE Dept UC San Diego, La Jolla, CA, YOLANDA BENITO, JAVIER BERMEJO, Cardiology Dept, Hospital Gregorio Maranon, Madrid, Spain, MARTA ALHAMA, Internal Medicine Dept, Scripps Green Hospital, La Jolla, CA, RAQUEL YOTTI, CANDELAS PEREZ DEL VILLAR, Cardiology Dept, Hospital Gregorio Maranon, Madrid, Spain, PABLO MARTINEZ-LEGAZPI, MAE Dept UC San Diego, La Jolla, CA, ANA GONZALEZ MANSILLA, FRANCISCO FERNANDEZ-AVILES, Cardiology Dept, Hospital Gregorio Maranon, Madrid, Spain — Intraventricular flow generates a vortex ring during rapid filling that optimizes filling, couples inflow kinetic energy to ejection, improves blood mixing and avoids stasis. LV vorticity has been related to chamber geometrical properties, but the effects of electrical events have never been characterized, partly due to the difficulty of performing MRI in patients with implanted devices. We have recently developed a new method that allows measuring vortex properties by processing conventional transthoracic color-Doppler sequences. Using this modality, 27 patients carrying an implantable cardiac resynchronization device were studied after AV optimization at 100 beats per minute. Our results reveal that, compared to optimal AV, the main vortex component remained closer to the base during 100BPM (difference = -20% of Lax length, $p < .05$) and closer to the apex when AV is minimized (diff= +11% of Lax, $p < .05$). Radius, circulation and energy of the vortices were larger when AV is maximized ($p < .05$). In conclusion, the duration of diastole, as modulated by heart rate and AV-delay, significantly modifies intraventricular vortex dynamics.

¹Funded by NIH Grant R21HL108268

Juan C. del Alamo
MAE Dept UC San Diego, La Jolla, CA

Date submitted: 10 Aug 2012

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