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Acute effects of multisite pacing on dyssynchrony and hemodynamics in canines with heart failure

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Multisite biventricular pacing (MSP) has been developed to improve cardiac resynchronization therapy, but its utility was not sure. Accordingly, we systematically evaluated the acute effects of MSP on dyssynchrony and heart function in canines with heart failure. After 3 weeks' rapid right ventricular pacing (RVP), 7 canines were implanted with 4 left ventricular(LV) leads on anterior, lateral, posterior and apical wall, and followed by MSP and conventional biventricular pacing(BVP). Hemodynamic, ECG and echocardiographic indexes were measured. Intra-ventricular mechanical dyssynchrony were quantified by Yu-index (longitudinal direction) from tissue Doppler imaging, and the standard deviation of time to peak radial strains (SDe, radial direction) from speckle tracking imaging. As a result, compared with BVP, MSP reduced QRS width, Yu-index and SDe (all P<0.05). Meanwhile, only LV end-diastolic pressure (LVEDP) decreased significantly in MSP when comparing to BVP (P<0.05). Between the best and worst MSP (according to dP/dt_{max}), significant differences were found in LVEDP, dP/dt_{max}, QRS width, YU-index and SDe (all P<0.05). Acute MSP possessed better synchronous contraction and diastolic heart function than BVP, and the LV pacing sites is an important determinant.

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