

JSPCCS-AEPC Joint Session

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[AEPCJS] JSPCCS-AEPC Joint Session (II-AEPCJS)

Optimization and transitional care of cardiac pacing and resynchronized therapy in congenital heart disease

Chair:Nico A. Blom(Leiden University Medical Center and Amsterdam University Medical Center, The Netherlands)

Chair:Shin Ono(Kanagawa Children's Medical Center)

[II-AEPCJS-1] Cardiac resynchronization therapy for failing sub-pulmonary right ventricle

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Keywords : Right ventricle、 right bundle branch block、 cardiac resynchronization therapy

Electromechanical dyssynchrony leading to contractile ventricular discoordination is a recognized reason for heart failure treatable by cardiac resynchronization therapy (CRT). Patients after surgical repair of congenital heart disease frequently suffer from right ventricular (RV) dysfunction associated with right bundle branch block (RBBB) and related electromechanical dyssynchrony. In the 2023 HRS guidelines on physiologic pacing for avoidance and mitigation of heart failure sub-pulmonary RV dysfunction with RBBB is accepted as a class IIb indication for CRT by RV free wall fusion pacing to improve RV function.

Recent advances in both non-invasive electrical activation imaging by ultra-high frequency ECG and mechanical imaging by speckle tracking echocardiography have enabled to study RV electromechanical interaction in RBBB and characterize the substrate for RV CRT in patients after repair of tetralogy of Fallot. Further studies described both the effects of RV CRT in limited cohorts of congenital heart disease patients acknowledging its independent role in the treatment of RV dysfunction beyond correction of hemodynamic residua. Furthermore, the use of computational modelling enabled creation of digital patient twins to predict the effects of RV CRT at various degrees of residual pulmonary stenosis and regurgitation pathing the way to individualized precise medicine.

RV CRT is evolving to a complimentary therapy for sub-pulmonary RV dysfunction with precise indications yet to be established and long-term impact to be evaluated.