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When the guidelines don't apply: Contractility (dp/dt-max)-guided resynchronization pacing among patients with congenital heart and heart failure

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Objectives: Patients (pts.) with repaired congenital heart disease (CHD) can later develop heart failure (HF), leading to heart transplant (HT). Although cardiac resynchronization pacing therapy (CRT) has been applied to pts. with normal anatomy, there is little information on CRT and CHD. This study evaluated acute hemodynamic contractility (dP/dt), not guidelines, among CHD pts. to determine if it can predict chronic CRT efficacy.

Methods: Forty pts. with CHD and HF (NYHA II-IV) underwent cardiac catheterization (cath) with dP/dt-max both before and after acute CRT pacing. If acute paced-dP/dt-max improved $\geq 15\%$ from baseline with CRT pacing, pts. were given the option of CRT. Clinical follow-up after CRT testing was from 2-144 months (mean 35).

Results: Pre-existing pacemakers were present in 70% of pts. CHD was variable with 16/40 (40%) pts. having either a single or systemic "Right" ventricle morphology. Of the 40 pts., 26 (mean age 22 y) met criteria for CRT benefit while 14 (mean age 29 y) did not. There were no differences in age, QRS duration, left ventricular (LV) ejection fraction, LV end diastolic diameter, V contractility (dP/dt-max), nor PM between CRT groups. Among the CRT recipients, 21 pts. (81%) improved in NYHA class and were removed from HT consideration. All underwent a repeat cath 6-14 months later showing continued improved contractility.

Conclusion: Since published CRT guidelines do not apply to CHD pts., a better way to select which CHD pts. may benefit from CRT is needed. Pre-CRT testing by direct paced-contractility response improves patient selection and responder rates.

Biography

Peter P Karpawich completed his Master's in Science degree from The University of Detroit and his Medical degree from Hahnemann/Drexel University in Philadelphia, PA; his Post-doctoral Residency in Pediatrics at The Children's Medical Center, University of Texas (Dallas) and Pediatric Cardiology Fellowship at Texas Children's Hospital, Baylor University (Houston). He founded and is Director of the Cardiac Electrophysiology Program at the Children's Hospital of Michigan and Professor of Pediatric Medicine, Wayne State University School of Medicine (Detroit). He has published over 200 scientific papers, textbook chapters and textbooks typically in the field of cardiac electrophysiology, pacing and heart failure management both in children and adults with congenital heart disease, and is on the Editorial Staff of several internationally-recognized medical journals.

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