Systolic dysfunction caused by electrical dyssynchrony is "always" reversible

Scott Sakaguchi MD, Ahmet S. Adabag MD, Melanie Kapphahn RN, Julie Granroth RN, David G. Benditt MD.

University of Minnesota, Minneapolis MN, Minnesota VA Medical Center, Minneapolis MN

Introduction: Cardiac resynchronization therapy (CRT) may improve systolic function in patients with low LVEF and prolonged QRS duration. Electrical dyssynchrony, e.g. from single-site ventricular pacing or LBBB, may produce unfavorable remodeling and decrease LVEF. We postulated CRT reliably improves LVEF in such patients.

Methods: We retrospectively reviewed charts of consecutive patients who (1) had LVEF≥50% at implant of a non-CRT device, (2) subsequently had 10% or more loss in LVEF, and (3) then were upgraded to a CRT device with follow-up LVEF documented at least 6 months later.

Results: Of 113 cases, 14 met inclusion criteria (9M;5F). The age (mean±s.d.) at CRT upgrade was 66.6±12.8 years. RV pacing was the source of electrical dyssynchrony except in 2 patients who had minimal pacing but who developed LBBB. Initial LVEF was 57.0±6.1% and was 28.9±7.8% by the time of CRT upgrade. All 14 subsequently increased LVEF ($p<0.001$, Wilcoxon test), with minimum increase 7.5%. LVEF post-CRT was 53.5±4.6%, and was not significantly different from initial LVEF ($p=0.21$). For each patient final LVEF was a minimum of 77% of original.

Conclusion: CRT reliably and significantly reversed systolic dysfunction caused by electrical dyssynchrony. We postulate that among patients with systolic dysfunction and prolonged QRS duration, optimal CRT may fully reverse that component of systolic dysfunction caused by electrical dyssynchrony.