



Imaging

LEFT VENTRICULAR FUNCTION, AORTIC VELOCITY AND LATE GADOLINIUM ENHANCEMENT ASSESSED BY REAL-TIME AND SINGLE SHOT CMR IS COMPARABLE TO BREATH-HELD SEGMENTED IMAGING: A PROSPECTIVE STUDY

Poster Contributions

Poster Sessions, Expo North

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Background: Widespread use of CMR has been hampered by long exam times that limit cost-effectiveness, and limited reliability in patients with irregular rhythm and/or inability to breath-hold. These limitations result from the use of segmented sequences requiring breath-holding and regular rhythm. Single-shot (SS) and real-time (RT) techniques are much faster and free of these limitations; however, it is not known whether these faster techniques are as accurate. We compared left ventricular ejection fraction (LVEF), wall motion (WM), aortic velocity (AV), and late gadolinium enhancement (LGE) by SS and RT techniques vs. breath-hold (BH) segmented acquisitions.

Methods: 19 patients referred for CMR for evaluation of cardiomyopathy were prospectively enrolled. All patients were in regular rhythm and able to breath-hold. Segmented acquisitions (cine, velocity mapping (VM), and LGE) were acquired during breath-hold; RT images (cine, VM, and LGE) were acquired during free-breathing. BH and RT cine, and LGE images were blinded and scored segmentally by two independent reviewers. WM was scored as normal, hypokinetic, akinetic, or dyskinetic. LVEF was calculated using Simpson's rule on short-axis BH cines, and biplane area-length method on long-axis RT cines. Peak AV was assessed in BH and RT images and compared.

Results: There was good to excellent agreement between RT and BH for all parameters: the kappa statistic for WM scored on a 4-point scale was 0.63 for reviewer 1 (n=323) and 0.72 for reviewer 2 (n=323), indicating substantial agreement. When assessed as normal vs. abnormal segmental function, the kappa values increased to 0.74 and 0.72. Quantitative assessment of EF and peak AV revealed excellent concordance correlations of 0.86 and 0.88 respectively between BH and RT acquisitions. LGE assessments reviewed for normal vs. ischemic vs. non-ischemic pattern had kappa values of 0.71 and 0.60 for the two reviewers, again indicating substantial agreement.

Conclusions: Prospective, real-time data acquisitions of LVEF, LGE, and quantitative VM yielded results comparable to traditional BH methodologies and may be used to reduce exam time and improve reliability.