

Poster presentation

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Utilization of cardiac magnetic resonance imaging in extremely obese adolescents scheduled for bariatric surgery

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Introduction

Bariatric surgery has been shown to provide significant and durable weight loss in extremely obese adults and its application and outcomes in the adolescent population is the main focus of several on-going prospective studies in the United States and elsewhere. Pre-surgical cardiovascular (CV) screening in the adolescent population is warranted as extreme obesity is an independent predictor of numerous forms of cardiac disease and mortality and is often complicated by practical and technological issues.

Purpose

The objectives of our study was to evaluate the feasibility and patient acceptance of employing cardiac magnetic resonance (CMR) as a modality for presurgical screening of adolescent bariatric surgery patients.

Methods

Fourteen extremely obese adolescents (mean age 17 yrs, BMI 53 ± 10 kg/m²) scheduled for bariatric surgery, using a standard protocol for determination of LV structure (mass, volume, delayed enhancement as evidence of fibrosis, pericardial fat), and LV systolic and diastolic performance using a 1.5 T, Siemens Espree MR scanner. Due to the influence of morbid obesity CMR parameters were derived and normalized to height. We compared these experiences to standard two-dimensional (2D) transthoracic echocardiography (TTE).

Results

All study patients were accommodated by the CMR unit and our 40 min protocol was well accepted by all patients. In addition all CMR images were well-suited for analyses, whereas the majority of TTE studies (86%) were incomplete due to poor acoustic windows caused by chest wall fat. CMR derived parameters were: LV mass 0.73 ± 0.15 g/cm; LV volume: 0.93 ± 0.15 mL/cm; LVEF $61 \pm 4\%$, with no evidence of fibrosis. Epicardial fat was also measurable in each CMR exam (0.34 ± 0.15 cm).

Conclusion

Our experience supports the use of CMR as both safe and effective as a pre-operative screening tool for extremely obese adolescents regardless of the degree of chest-wall adiposity. This imaging modality may be superior to traditional 2D TTE methodology in defining cardiac structural and functional characteristics in this specific patient group. As morbid obesity prevalence continues to rise in adolescents, the value and demand for CMR modalities in this setting may also increase.