

Global radial strain is reduced in healthy heart transplant patients

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Background: Allograft rejection and vasculopathy in heart transplant (HTx) patients require timely recognition, with coronary angiography and endomyocardial biopsy being the diagnostic gold standards. Finding a non-invasive alternative remains the major objective. Speckle tracking echocardiography (STE) permits early recognition of myocardial dysfunction. The reduction in strain has been shown to denote both rejection and vasculopathy^{1,2}. However, deformation indices are also reduced in “healthy” HTx recipients ≥ 1 year after transplantation when compared with control subjects³. Whether the reduction in strain is a chronic progressive process or the immediate result of transplantation (due to allograft ischaemia, denervation, cardioplegia etc.) has not yet been established. Hence, the lack of STE reference values in HTx population, especially during early post-transplant period, is one of the reasons that strain has not been used to follow-up these patients. The aim of the study was to evaluate whether radial deformation parameters are reduced in “healthy” HTx recipients during the first post-transplant year.

Methods: Two-dimensional STE was used to evaluate radial strain in 15 “healthy” patients up to 6 months following heart transplantation. Patients were excluded if they had histologic evidence of acute rejection ($>1A$ ISHLT), reduced LVEF ($<55\%$), significant coronary vasculopathy (epicardial coronary narrowing $>50\%$ assessed by coronary angiography), wide QRS-complex (>120 ms), significant valvular di-

sease or major cardiac events. Frame rates of ≈ 50 to $70s^{-1}$ to avoid speckle decorrelation and good image quality for accurate tracking were mandatory. Segmental radial strain analysis was performed at the LV basal, middle and apical levels, and values were averaged to determine global radial strain. The results were then compared with the healthy normal subjects’ values, using recent meta-analysis data⁴.

Results: Global radial strain was significantly lower in transplant patients when compared with control subjects — mean 39.2% (95% CI 33.5 to 44.9%) vs. 47.3% (95% CI 43.6 to 51.0%), p 0.008.

Conclusions: The reduction of global radial strain in “healthy” HTx subjects during early post-transplant period may be an immediate consequence of the transplant procedure. The baseline strain values should be obtained in all transplant patients soon after the transplantation, so that these values can later be used as a reference for early detection of myocardial abnormalities.

KEYWORDS: speckle tracking echocardiography, heart transplantation, radial strain.

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