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Objectives The current study aims to explore whether asymptomatic heart transplantation patients with normal LVEF have left ventricular systolic dysfunction or dyssynchrony by using Tri-plane Speckle Tracking Imaging (T-STI).

Methods Fifteen asymptomatic heart transplantation patients receiving routine follow-up echocardiography with LVEF>60% were randomly enrolled as heart transplantation group (HT Group). Twenty healthy subjects with normal physical exam, ECG, UCG, blood routine and biochemical examination were randomly enrolled as control group (Con Group).

Apical tri-plane loop was acquired (4V-D transducer, GE E9) and analysed offline using EchoPAC analysis station. Average longitudinal peak strain of apical four chamber view (GLPS-A4C), apical long axis view (GLPS-LAX), apical two chamber view (GLPS-A2C) and left ventricle (GLPS) were measured. Time to peak strain of 18 segments was analysed and its SD (18-SD) was calculated.

All the heart transplantation patients received routine blood exams within 12 h of their follow-up echocardiography. White blood cell count, Neutrophils count, lymphocytes count, neutrophils percentage and Lymphocytes percentage were recorded.

Results

1. GLPS-A4C, GLPS-LAX, GLPS-A2C and GLPS decreased significantly in HT Group than those in Con Group, while 18-SD increased significantly in HT Group than in Con Group (HT Group vs Con Group: GLPS-A4C, 16.13±3.64% vs 21.31 ±4.15%; GLPS-LAX, 15.31±4.30% vs 20.61±4.40%; GLPS-A2C, 16.46±3.58% vs 21.45±4.58%; GLPS: 15.96±3.35% vs 21.12 ±3.75%;18-SD, 27.63±10.80 vs 15.74±3.75; all $p<0.01$).
2. In HT Group, value of 18-SD showed positive correlation with white blood cell count ($r=0.54$, $p<0.04$)

Conclusions

1. Tri-plane imaging can display apical four chamber view, long axis view and two chamber view at the same time. It is helpful to evaluate ventricular synchrony and is promising in follow-up heart function assessment of heart transplantation patients.
2. Asymptomatic heart transplantation patients with normal LVEF may also have sub-clinical systolic dysfunction and ventricular dyssynchrony, which may be caused by post-transplant chronic rejections.

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LEFT VENTRICULAR DYSSYNCHRONY CAN BE SEEN IN ASYMPTOMATIC HEART TRANSPLANTATION PATIENTS WITH NORMAL LVEF: A TRI-PLANE SPECKLE TRACKING STUDY

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