**Purpose**

Aim of this study was the detailed assessment of the LV function with 3DST after prolonged and strenuous exercise.

**Methods**

We analyzed LV function of 60 healthy male runners (baseline characteristics are shown in Table 1) with 3-dimensional echocardiography one week before (V1), and 0 (V2), 24 (V3), and 72 (V4) hours after the race. We analyzed the captured loops offline with a new software tool ‘Tomtec 4D LV-Function’. This tool allows us to analyze ejection fraction (EF), global longitudinal strain (GLS) and maximum rotation (twist=sum of the rotation of the basal and apical LV plane) 3-dimensionally. Furthermore, we also assessed the new parameters of LV dyssynchrony (systolic dyssynchrony index (SDI) I & II). Additionally, ratio of systolic blood pressure to end-systolic volume (SBP/ESV) was calculated as an index of contractility.

**Results**

“Conventional” echocardiographic parameters are shown in Table 2. The increase of the twist within the first 24 hrs post-race resulted primarily in the increase of the rotation of the basal LV-plane (V1: 6.1±2.1° vs. V2: 7.8±2.8°, p<0.001) whereas the rotation of the apical plane was less pronounced (V2: 9.5±3.5° vs. V3: 18.5±3.8°, p=0.05). Measures of LV dyssynchrony were shown in Figure 1.

**Conclusions**

Marathon running results in an increase LV-twist immediately post-race mainly due to increased rotation of the basal plane. Furthermore, intraventricular LV dyssynchrony was increased.