Three Dimensional Left Atrial Speckle Tracking may detect Cardiac Changes due to Chemotherapy by Trastuzumab

[Background]
Drug-induced cardiomyopathy often occurs in patients who undergo trastuzumab chemotherapy. Thus, it is important for these patients to undergo periodic echocardiography. In the early phase of the drug-induced cardiomyopathy, a diastolic disorder appears first, which may be detected by a three dimensional left atrial speckle tracking echo.

[Methods]
Using three dimensional echocardiography, we assessed 140 patients between January 2014 and June 2015. Patients were divided into two groups: a post chemotherapy trastuzumab group (12 patients, age: 65 &plusmn 5.8 years) and a control group without heart disease (21 patients, age: 73 &plusmn 6.5 years). We analyzed the three dimensional left atrial speckle tracking: left atrial global longitudinal strain (LA GLS), left atrial global circumferential strain (LA GCS), and the left atrial global radial strain (LA GRS). Using these three indices with the diastolic index (E/A) and systolic index (LVEF), we were able to compare the differences between the two groups.

[Results]
Significant differences were observed for LA GLS (chemo. vs. cont. 21.8 &plusmn 6.1 vs. 16.8 &plusmn 4.7, p < 0.05) and E/A (0.84 &plusmn 0.21 vs. 0.68 &plusmn 0.19, p < 0.05). No significant differences were observed for LA GCS (27.32 &plusmn 21.6 vs. 17.9 &plusmn 10.9, p = 0.08), LA GRS (−23.9 &plusmn 12.7 vs. −19.2 &plusmn 7.4, p = 0.14), and LVEF (70.1 &plusmn 3.2 vs. 69.1 &plusmn 5.5, p = 0.26).

[Conclusion]
The post chemotherapy group showed changes in the three dimensional LA GLS and E/A. This suggests that LA GLS may be useful in detecting the cardiac changes due to chemotherapy by trastuzumab.