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## Heart Failure and Cardiomyopathies

### ASSESSMENT OF CARDIAC FUNCTION FOLLOWING PROTON RADIATION IN A COHORT OF POST MASTECTOMY PATIENTS WITH LOCALLY ADVANCED BREAST CANCER

Poster Contributions

Poster Hall B1

Sunday, March 15, 2015, 9:45 a.m.-10:30 a.m.

Session Title: World of Cardiomyopathies

Abstract Category: 14. Heart Failure and Cardiomyopathies: Clinical

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**Background:** Conventional photon radiotherapy (RT) for breast cancer is cardiotoxic. The physical properties of protons is an alternative form of radiotherapy with much reduced radiation dosages, thus may be less cardiotoxic. Aim: To determine if proton therapy results in subclinical cardiac dysfunction in a cohort of patients with locally advanced breast cancer receiving adjuvant chemotherapy.

**Methods:** Thirty one women (mean age 46.6 ± 10.4 years; mean BMI 26.0 ± 5.2 kg/m<sup>2</sup>) were prospectively examined. Mean radiation dose to the heart and LV were 0.44 Gy and 0.12 Gy respectively. Sequential echos were obtained prior to RT (E1), right after RT (E2), and 2 months after completion of RT (E3), LVEF was measured by modified Simpson's biplane method. Two-dimensional global systolic longitudinal strain (2D-GLS) in the 4-, 3- and 2- chamber views, were measured in a vendor independent manner (TomTec, Germany). Serum was collected for analysis of biomarkers for heart failure (high sensitivity troponin I, NT-proBNP and myeloperoxidase).

**Results:** No significant decrease in LVEF, overall 2D-GLS for anterior wall (which is most at risk of damage) and LV, or significant increase in serum levels of biomarkers of heart failure tested (Table).

**Conclusion:** Proton radiotherapy did not impact echo measures of LV function, or cause a rise in biomarkers of heart failure suggesting lack of significant acute subclinical cardiotoxicity, supporting the potential benefits of proton therapy compared to conventional radiotherapy.

Parameter	1 <sup>st</sup> Echo (E1)	2 <sup>nd</sup> Echo (E2)	3 <sup>rd</sup> Echo (E3)	P value ANOVA
N=31				
LVEF (%)	62 ± 4	62 ± 5	63 ± 3	0.78
Global Systolic LS (%)	-19.6 ± 2.7	-19.5 ± 3.2	-19.5 ± 3.2	0.99
Septal wall LS (%)	-19.1 ± 3.1	-18.8 ± 3.0	-19.9 ± 2.9	0.22
Lateral wall LS (%)	-20.0 ± 4.5	-20.5 ± 4.4	-20.5 ± 6.4	0.74
Inferior wall LS (%)	-18.6 ± 3.9	-19.6 ± 4.3	-19.8 ± 6.0	0.61
Anterior wall LS (%)	-19.5 ± 3.9	-21.0 ± 4.2	-21.1 ± 5.5	0.23
Posterolateral wall LS (%)	-20.3 ± 5.7	-20.1 ± 5.7	-17.6 ± 5.6	0.09
Anteroseptal wall LS (%)	-19.7 ± 4.4	-18.7 ± 5.6	-19.1 ± 4.1	0.77
<b>Novel Serum Biomarkers</b>				
High sensitivity Troponin I (pg/ml)	13.3 ± 18.5	8.5 ± 6.3	6.8 ± 6.8	0.0003
NT-proBNP (pg/ml)	85.3 ± 62.1	102.1 ± 67.7	91.1 ± 62.6	0.19
Myeloperoxidase (MPO) (pmol/L)	438.1 ± 186.0	609.6 ± 479.6	640.7 ± 636.8	0.06