



## Heart Failure and Cardiomyopathies

### EARLY CHANGES IN CARDIOVASCULAR BIOMARKERS WITH CONTEMPORARY THORACIC RADIATION THERAPY FOR BREAST CANCER, LUNG CANCER, AND LYMPHOMA

Moderated Poster Contributions

Heart Failure and Cardiomyopathies Moderated Poster Theater, Poster Hall, Hall F  
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**Background:** Improved characterization of the acute subclinical changes that occur after thoracic radiation therapy (RT) is crucial to understanding the pathogenesis of RT-induced heart disease. We sought to characterize the early changes in cardiovascular biomarkers with contemporary thoracic RT and evaluated their associations with mean heart dose (MHD).

**Methods:** In a prospective longitudinal study of 87 patients with breast cancer, lung cancer or mediastinal lymphoma treated with photon or proton thoracic RT, blood samples were obtained pre-RT and after completion of RT (median 20 days, interquartile range (IQR) 1,35). High sensitivity cardiac troponin T (hs-cTnT), N-terminal pro-B-type natriuretic peptide (NT-proBNP), placental growth factor (PIGF) and growth differentiation factor 15 (GDF-15) were measured at the two visits. Associations between MHD and biomarker levels after completion of RT were assessed in multivariable linear regression models that included pre-RT biomarker levels, age, anthracycline or trastuzumab exposure prior to RT, hypertension and diabetes mellitus. Analyses were performed according to the following subgroups: 1) breast cancer alone and 2) lung cancer and lymphoma combined.

**Results:** The median (IQR) estimates of MHD ranged from 1.3 Gy (0.9,2.4) in breast cancer (n=60) to 6.8 Gy (5.4,10.2) in mediastinal lymphoma (n=14) and 8.4 Gy (6.7,16.1) in lung cancer (n=13) patients (p<0.001). There were no significant increases in biomarker levels from pre-RT to post-RT in breast cancer. In lung cancer/lymphoma, PIGF increased from a median (IQR) of 20 ng/L (16,26) to 22 ng/L (16,30) (p=0.005) and GDF-15 increased from 1171 ng/L (755,2493) to 1887 ng/L (903,3763) (p=0.006). MHD was significantly associated with post-RT PIGF and GDF-15 levels in multivariable models (p<0.05).

**Conclusion:** Our study provides the most robust evidence to date suggesting that thoracic RT induces acute abnormalities in vascular and inflammatory biomarkers that are associated with MHD, particularly in lung cancer and mediastinal lymphoma. Long-term follow-up studies are needed to determine the impact of these changes on the development of overt cardiac disease.