

## **Chemoradiotherapy treatment increases cardiac and aortic [<sup>18</sup>F]FDG uptake ratios in lung cancer patients**

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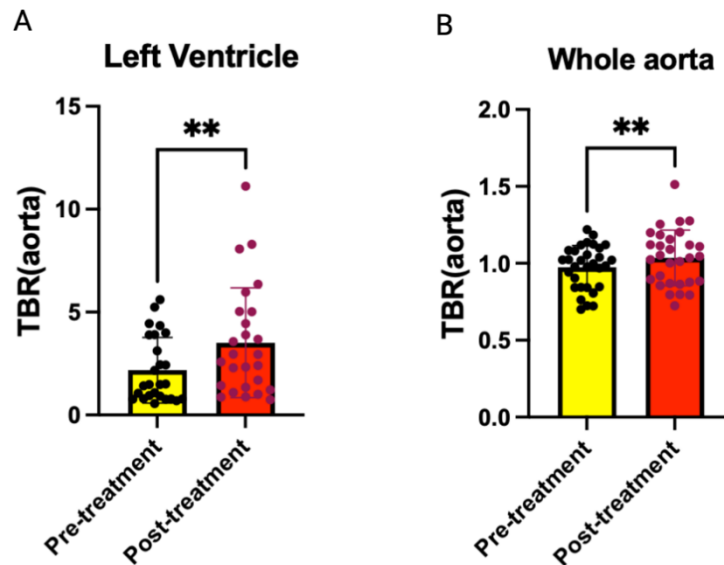
[<sup>18</sup>F]Fluorodeoxyglucose (FDG) positron emission tomography (PET) is an indispensable non-invasive imaging tool to aid diagnosis, prognostication, and therapeutic monitoring in oncology, but it can also evaluate cardiovascular inflammation<sup>1,2</sup>. Previously, cardiac metabolic changes using [<sup>18</sup>F]FDG with chemoradiotherapy have been explored<sup>3</sup> but changes in the rest of the cardiovascular system remain undetermined.

To investigate the cardiovascular metabolic changes pre- and post-chemoradiotherapy in stage 3b non-small cell lung cancer (NSCLC) patients.

A retrospective analysis of 26 patients (43-82 years) with stage 3b NSCLC from the American College of Radiology Imaging Network (ACRIN 6668) trial was performed<sup>3</sup>. All available pre- and post-treatment imaging were retrieved from the Cancer Imaging Archive (TCIA)<sup>4</sup> and regions of interest for the left ventricle and calcified large arteries were contoured on all PET-CT scans using PMOD version 4.0 software. The mean, maximum standard uptake value (SUV<sub>mean</sub> and SUV<sub>max</sub>) and target-to-background ratio (TBR) were quantified on PMOD.

At approximately 14 weeks post-chemoradiotherapy, there was a higher SUV<sub>mean</sub> (mean difference 0.81, p=0.01) and SUV<sub>max</sub> (mean difference 2.20, p=0.006) in the left ventricle compared with pretreatment scans. TBR for aorta was higher post-treatment (mean difference 0.06, p=0.005). However, SUV<sub>mean</sub> for carotid arteries and right brachiocephalic artery was reduced post-chemoradiotherapy (mean difference 0.15, p=0.008 and mean difference 0.28, p=0.03). A reduction in SUV<sub>max</sub> was also seen for aortic arch (mean difference 0.58, p=0.03) and right brachiocephalic artery (mean difference 0.42, p=0.03 and mean difference 0.42, p=0.03).

Cardiovascular glucose metabolism is selectively increased in the left ventricle and aorta post-chemoradiotherapy. Changes in glucose metabolism of atherosclerotic plaques vary across different vessels throughout the body.



**Figure. 1** Target-to-background ratio relative to aortic blood pool is increased post chemoradiotherapy in both the left ventricle and the whole aorta.

#### References:

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