

Major Adverse Cardiac Events After Radiation Therapy in Lung Cancer

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Motivation:

Receiving radiation to the heart has been recognized as a risk factor for the development of major adverse cardiovascular events (MACEs) for many years. However, recent data suggests that radiation dosing to substructures of the heart serve as a better surrogate for evaluating the risk of developing a MACE than whole heart radiation dose. Recent papers suggest that dosing to the left anterior descending artery (LAD) can be used as a robust marker for cardiotoxicity risk; however, this association lacks corroborative data and is currently not incorporated into clinically routine care.

Problem:

In this paper we seek to investigate the relationship between radiation dose to the LAD and risk of developing a MACE in lung cancer patients treated with curative intent radiation.

Approach:

Chart review to confirm the presence of MACE events was performed in patients who were identified based on elevated troponin values to potentially have had a MACE after receiving their last dose of radiation therapy. Patients who had multiple courses of radiation therapy separated in time (>60 days) that received greater than 0.2 Gy whole heart dose during their subsequent courses before having a MACE were excluded. Selected patients were then stratified based on presence cardiovascular co-morbidities. Contours of patient's LADs were made after patient selection, and will be verified by an expert (e.g., cardiologist or thoracic radiologist).

Results:

Dose to the LAD will be calculated and an assessment of the correlation between radiation dose and risk of having a MACE will be made. Analysis will assess the cardiac event rate at various times as well as time to MACE.

Implications:

This paper can help set a quantifiable standard with which radiation oncologists can use to minimize their patient's risk of developing a MACE by minimizing radiation dosing to specific cardiac substructures while maintaining tumor coverage.