

# Obesity significantly increases side effects of stereotactic body radiation therapy in lung cancer patients

November 2 2009

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Obesity, not the amount of radiation given, is the greatest factor in whether early-stage lung cancer patients develop chest wall pain after receiving stereotactic body radiation therapy to the chest wall, with obese patients being more than twice as likely to develop chronic pain compared to those who have less body weight, according to a first-of-its-kind study presented Tuesday, November 3, 2009, at the 51st Annual Meeting of the American Society for Radiation Oncology (ASTRO).

Researchers studied other factors associated with obesity, such as diabetes, to find out why obesity in patients increased chest wall pain. Findings show that obese patients who are diabetic are over three times more likely to develop chest wall pain after receiving stereotactic body radiation therapy to the chest wall, compared to patients who do not have diabetes.

"The study shows that physiological factors, such as obesity and diabetes, can play a major role in the development of radiation-related toxicity," James Welsh, M.D., lead author of the study and a radiation oncologist at the M.D. Anderson Cancer Center in Houston said. "This is a surprising finding, since most side effects of radiation treatment are based on the amount of normal tissue that is treated and the volume of the dose."

The main purpose of the study was to find out what the highest amount

of radiation that could be delivered to the chest wall using a specialized type of radiation treatment called stereotactic body radiation therapy (SBRT) without patients developing the late side effects of pain and skin reactions. The study shows that patients who receive a high dose of radiation to cancer close to the chest wall (in the amount of 35 gray (Gy) have an increased chance of having pain and skin reactions, compared to those who have a lower [radiation dose](#).

SBRT is a specialized type of external beam radiation therapy that pinpoints high doses of radiation directly on the cancer in a shorter amount of time than traditional treatments. Cancer centers often call the treatments by the brand names of the manufacturers, including Axesse, CyberKnife, Gamma Knife, Novalis, Primatom, Synergy, X-Knife, TomoTherapy and Trilogy. Treatment is typically delivered in 1 to 2 weeks, instead of a period of 6 to 8 weeks.

"SBRT is now being investigated as a replacement to surgery for early-stage [lung cancer](#). If this non-invasive technique is to replace surgery, not only does it need to be effective, but also safe," Dr. Welsh said.

"Since this study shows that a 35Gy dose of radiation, obesity, and diabetes increase the risk of developing late negative side effects after high dose radiation, then we can take steps to reduce these side effects."

The study involved 265 patients with tumors within less than 2.5 centimeters of the chest wall, who were treated with SBRT between August 2004 and August 2008. Of these patients, 39 percent developed skin toxicity, while six percent developed acute pain and 22 percent developed [chronic pain](#). In patients who are considered obese, diabetes mellitus was found to be a significant contributing factor in the development of chest pain.

Source: American Society for Radiation Oncology

Citation: Obesity significantly increases side effects of stereotactic body radiation therapy in lung cancer patients (2009, November 2) retrieved 17 April 2024 from <https://medicalxpress.com/news/2009-11-obesity-significantly-side-effects-stereotactic.html>

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