



SUMMARY OF SCIENTIFIC BREAKTHROUGHS FROM THE 2019 ASTRO ANNUAL MEETING

THE ROLE OF RADIATION THERAPY IN CANCER CARE

Introduction

Hearing a cancer diagnosis is scary. Overwhelming. Confusing. Many questions flood your mind when you learn you or a loved one have cancer. And trying to learn and understand all the treatment options can be daunting to say the least. At the American Society for Radiation Oncology (ASTRO), our mission is to advance the practice of radiation therapy by promoting excellence in patient care, which includes promoting radiation oncology research and disseminating results to both our members and patients.

For more than 100 years, doctors have been using radiation therapy, also known as radiotherapy, to treat patients diagnosed with cancer. Radiation therapy is often combined with other treatment options, like chemotherapy or surgery, or used as a stand-alone treatment. Radiation therapy is an effective option for many people faced with a cancer diagnosis. In fact, nearly two-thirds of all cancer patients are treated with radiation during their illness.

Radiation therapy targets cancer cells and damages the DNA of the cell. The radiation destroys the ability of the cancer cells to reproduce and repair, causing the cells to die. Once these cancer cells die, the body naturally eliminates them. Normal cells that surround the cancer cells are affected by the radiation treatment as well, but the normal, healthy cells can repair themselves far better than the cancer cells. Advances in radiation therapy have allowed doctors to better target the cancer to reduce the risk of side effects from radiation. Despite the name, radiation therapy does not cause a patient to become radioactive. Radiation therapy treatments allow most patients to continue with their typical daily activities. Side effects vary based on the location and type of cancer, and many patients continue to work or go to school while undergoing treatments.

With radiation therapy, research often focuses on this question: What is the right dose of radiation for each patient? Sometimes more intense therapy is needed, and in others, is it possible to reduce the amount and intensity of treatments while still achieving excellent outcomes for patients? How do radiation oncologists find the right balance between reducing treatment doses to improve patients' quality of life while making sure that the reduced treatment remains powerful enough to stop the cancer from spreading?

The answer is research, where scientists and physicians work together to discover new cancer treatments. Today, radiation oncologists are actively researching safe and effective radiation treatments, including more personalized approaches and studies of lower doses for a variety of cancers.

In an effort to disseminate the latest science related to radiation therapy, ASTRO prepared this pamphlet, which highlights some of the top research presented at our 2019 Annual Meeting.



We encourage you to review all of your treatment options, including radiation therapy, with your primary care physician before determining which option or combination of options is best for you and your lifestyle.

Theodore L. DeWeese, MD, FASTRO
Chair, ASTRO Board of Directors



Lung

Lung cancer is the leading cause of cancer death among both men and women, according to the American Cancer Society. Each year, more people die of lung cancer than of colon, breast and prostate cancers combined.

Lung cancer is generally categorized as “small cell” and “non-small cell,” based on looking at the cancerous cells under a microscope. Small cell cancer is the less common and more aggressive of the two. It has often spread to other organs by the time it’s discovered and has an average five-year survival rate of only 6%. Non-small cell cancer, which accounts for 80% to 85% of diagnoses, has a better five-year survival rate of 60% if it’s caught while still localized. If the non-small cell cancer has spread to nearby regions, the rate drops to 23% five-year survival. Finding ways to improve those rates is a top priority for many lung cancer researchers.

New radiation treatment plans for lung cancer

Can some lung cancer patients improve their prognoses by receiving extra radiation treatments over a shorter time than usual, without suffering additional side effects from the treatment? A recent study is cautiously optimistic, though the researchers warn that the technique needs to be studied further and in combination with other treatments.

Conducted at UCLA, the study evaluated 28 patients on a prospective Phase II study with inoperable non-small cell lung cancer that was locally advanced and gave them an accelerated course of radiation and chemotherapy, further “boosted” by targeted radiation treatments using stereotactic ablative radiotherapy, or SABR.

The current standard of care for patients with locally advanced non-small cell lung cancer is chemotherapy at the same time as radiation therapy for six weeks, said lead author Percy Lee, MD, a radiation oncologist who specializes in SABR. “Outcomes for this treatment plan are suboptimal, with poor cancer control and long-term survival,” he said. The study sought to answer several questions: whether higher doses of radiation, over three weeks, would be more effective than the current standard; how much radiation patients could tolerate without harmful reactions; and whether an extra “boost” of SABR radiation would improve patients’ survival rates.

The three-week regimen appeared to be safe and effective for many of the patients, though Dr. Lee did note that two patients out of 28 treated had fatal complications from the treatment. The patients’ overall survival rates were 78% at one year and 52% at two years. He said the advantage of using SABR as part of the treatment was that it minimizes high doses of radiation to normal tissues, including the heart, spinal cord, esophagus and airways.

However, Dr. Lee said this work is only the beginning of finding ways to combine SABR with other kinds of treatment. “With advances in radiation therapy planning and delivery, along with advances in systemic therapy with immunotherapy, we are seeing more favorable results and achieving higher rates of durable disease control and cure,” he said. “We believe that this abbreviated and dose-intense plan for chemoradiotherapy should be studied in combination with immunotherapy to see if we can further enhance disease control, survival and quality of life in these patients.”

Radiation therapy may increase immunotherapy results in patients with advanced lung cancer

When cancer patients have a widespread, or systemic, response to a localized therapy (for example, after radiation to one site of cancer leads to all sites of cancer shrinking), this is called the abscopal effect. Radiation oncologists are trying to better understand the abscopal effect in hopes of being able to trigger this response in patients more consistently. In that way, more patients could have better-than-expected responses to treatment, eventually improving the standard of care.

Allison Campbell, MD, PhD, of Yale University, and colleagues recently conducted a Phase II trial to study the abscopal effect in patients with metastatic lung cancer. “Our clinical trial enrolled patients with metastatic lung cancer who had their disease progress while undergoing immunotherapy,” she said. “We gave them radiation to just one cancerous lesion in the hopes that this would stimulate an anti-tumor immune response throughout the whole body.”

The researchers enrolled 50 patients with metastatic lung cancer who had not yet received immunotherapy and treated them with the drug pembrolizumab. Of these 50 patients, disease progressed in 16. These patients, plus six others whose cancer had already progressed on immunotherapy, received high-dose stereotactic body radiation therapy (SBRT) to a single tumor each. The patients who received SBRT experienced an average of five months before their cancer progressed. And nearly half of the SBRT patients achieved stable disease after treatment.

The researchers also found that 10% of patients in the study had tumors shrink that were located outside the area that received radiation. What’s more, this response continued for more than a year in some patients. This study, in combination with other recently published Phase I/II trials, indicates that the combination of immunotherapy and radiation is safe. “There are hints that adding radiotherapy to immunotherapy might emerge as an important therapeutic option when immunotherapy stops working,” Dr. Campbell said.