

USE OF RADIATION IN LUNG CANCER PATIENTS

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Why do patients with lung cancer receive radiation therapy to the lung? There are many reasons. For sure it is to control the cancer in the local area. For others it is to attempt to cure the malignancy.

When cancer is confined to the chest area only the purpose of medical treatment is to attempt to cure the patient. Of course, not every person with lung cancer is cured. The recurrence rate depends upon the size of the cancer, the ability to resect the cancer and whether the cancer has spread to the lymph nodes or other distant organs such as the liver, adrenal glands, bone or beyond. Determining the extent of disease is called the staging system.

The grading system evaluates the appearance of the cancer cell under the microscope. Different types of cancer are treated in different manners. Thus, biopsy is crucial. Other important issues of lung cancer include the type of cancer, the function of the patient and the selected treatment technique.

A recent paper from the Netherlands evaluated the quality of life after radiation in a prospective manner. An issue that is evaluated prospectively means the question has been asked prior to the patients being treated. This tends to minimize bias within reporting. The best medical results have the least bias - only the facts without prejudice.

The group led by Langendijk reporting in the International Journal of Radiation Oncology Biology and Physics expected to see that 75% of patients treated would have an improvement in hemoptysis or coughing blood and more than 50% to have a reduction in pain, cough and shortness of breath.

The researchers noted that radiation should achieve this goal by reducing the bulk of the cancer thus palliating symptoms and improving the patients' quality of life. They expected that there would be a greater improvement in patients whose tumor has shrunk than in those whose tumor did not shrink in size.

Between 1994 and 1996, 302 patients with inoperable lung cancer were seen in their institution for radiation. Seventy one patients who had limited function and/or supraclavicular lymph node involvement (lymph nodes above the clavicle felt clinically to contain cancer cells) or distant metastases with symptoms related to cancer in the chest were treated with radiation.

If the patient had surgery, chemotherapy or prior radiation, they were excluded. Also, excluded were patients whose cancer had traveled to the brain or those receiving radiation in other parts of the body. Eliminating these patients was felt to produce a purer and thus more important study.

Overall 69 patients were eligible and asked to participate. Two patients declined participation and two did not return the questionnaires, thus producing 65 patients in the study. Most patients (91%) were male and the mean age was 65 years (range was 39 to 88). All patients had non-small cell or non-oat cell lung cancer. Thus patients with the pathologic diagnosis of oat or small cell cancer were excluded.

The questions asked of patients numbered 30 and involved functions, symptoms, quality of life in addition to other major issues.

Radiation included the primary cancer and suspicious lymph nodes in the mediastinum or center of the chest and supraclavicular area with a margin of 2cm (centimeter) or about an inch. The dose was 300 rad times 10 doses or a total of 3000 rad (rad is a measure of radiation dose). This

would be considered relatively primitive radiation in this day and age. In our institution, much greater doses are delivered by newer methods of treatment to maximize effects on the cancer and minimize adverse reactions on healthy tissues. In our hands that would mean techniques such as stereotactic body radiosurgery or non-invasive means of administering more accurate radiation.

Cancers were measured using chest x-rays or CT scans. The response was whether the tumor completely disappeared or reduced by 50%. If the cancer was reduced by less than 50% it was said to be a non-response. It should be noted that in our institution, CT scans are utilized exclusively to judge results of treatment.

We believe this is a much more accurate system of measuring response. Cancer marker tests, physical exam and often bone and PET scans supplement as to determine extent of disease. (In our institution we use CT scans nearly exclusively to better define the cancer and its extent. Simple chest x-rays are frequently erroneous in this regard.)

Symptoms prior to treatment included fatigue in 94%, cough 89%, shortness of breath 88%, pain 86%, loss of appetite 71%, chest wall pain 62%, difficulty sleeping 57%, hemoptysis 46%, arm and shoulder pain 43%, nausea and vomiting 34%, concentration 31% and difficulty swallowing 25%. Hemoptysis is the medical terms for coughing up blood.

It was found that patients who responded to radiation were more likely to have improvement in shortness of breath and fatigue compared to those patients who did not respond to treatment. There was a trend in improvement of hemoptysis among those who responded to radiation treatment compared to those who did not.

Seventy nine percent of patients were said to have excellent palliation or improvement of hemoptysis. Fifty-two percent had good palliation in arm and shoulder pain, 60% had improvement in chest pain, 48% had diminished cough and 36% were less short of breath.

Our approach for patients having symptoms yet locally advanced cancer has been to offer more sophisticated radiation in an attempt to zero in and treat the cancer while minimizing harm to healthy normal tissue. With today's techniques for patients with localized cancer, we can go to higher doses that have been associated with high control or success rates. Our success rates in the treated area hover at 90% for thoracic cancers. By minimizing the amount of healthy lung being treated with radiation, there should be less adverse effects to the lung and better ability to control the cancer. Furthermore, other sites can be targeted as well with the same degree of success.

For patients with localized cancer, there is a greater chance of cure than if the cancer has spread beyond the original area. For those with metastatic cancer or malignancies that have spread, the purpose of sophisticated radiation is to relieve symptoms with a short burst of precise radiation. It can be used after or in lieu of chemotherapy in these sites. Some patients select to have chemotherapy and radiosurgery together.

Generally, our group stays away from the radiation fractionation schema described in the paper since it can indeed cause fatigue and has more adversity on the healthy normal tissue than either lower dose per fraction, radiation administered in a more frequent schedule to a greater total dose or more precise radiation administered in higher doses also given in a greater total dose while attempting to avoid healthy normal tissues. When proceeding to high dose treatment we prefer the accuracy of body radiosurgery to maximize dose and minimize access of healthy tissue from being in the radiation field.

Radiation certainly plays a role in the treatment of those with lung cancer. Chemotherapy is often used concurrently with radiation to sensitize the tissue to the radiation effects. Sometimes for those with relatively localized cancer surgery can play an important role either before or after

treatment depending upon the clinical stage and response to treatment.

Our multi-disciplinary group of lung cancer experts meets weekly to evaluate those with newly diagnosed or recurrent cancers of the lung. We feel a multi-disciplinary approach helps to provide the best patient care. There are present radiologist, radiation oncologists, pulmonary medicine experts, medical oncologists and thoracic surgeons among others.

Each case is individually evaluated for their unique issues with every patient who has cancer including the extent of disease, function of the patient and of course the desires of the patient and family after the risks, benefits and alternatives are explained and discussed.

Ultimately, the patient decides which medical route to take after the informed consent process. Follow-up is important as well. Speaking with the patient and their family, performing a physical exam and medical testing such as CT scan and bone scan as well as cancer marker testing helps reassure all that the cancer is in remission. Particular situations require the medical judgment of surgeons, radiologists, medical oncologists, radiation oncologists and more. This powerful group is at the disposal of patients and their families. There is no charge for review of one's material at this highly specialized lung cancer meeting.