BODY RADIOSURGERY FOR LUNG CANCER

By: Gil Lederman, M.D.

While there are many in the medical community including physicians and researchers as well as health insurance organizations that act if body radiosurgery did not exist yet, an increasing amount of data is being published and presented at national and international medical meetings.

Minoru Uematsu et al, recently published a paper using fractionated stereotactic body radiosurgery for lung primary tumors and metastases. Data has been accumulating at several centers world wide. While each of these facilities offers high dose pinpoint radiation to primary and metastatic cancers, each facility has slightly different techniques.

The Japanese unit consists of a Linac x-ray simulator, CT scan and treatment table in one room. The table rotates around these three pieces of equipment to help facilitate accurate treatment planning, confirmation and delivery.

Radiosurgery New York’s program uses a highly reproducible body mold custom fitted in an external stereotactic frame.

Their information was published in the prestigious journal, Cancer, and represents data collected over several years. Over a two and a half year period 110 tumors were treated including 66 tumors in 45 patients whose target was either primary lung cancer or cancers that had spread to the lung - metastatic lesions.

It was noted that the patients were either not operable for medical reasons or had refused surgery. Included were 27 men and 18 women, ranging in age from 28 to 86 years with a mean of 65 years.

The type of cancer included non-small cell lung cancer in 23. Forty-three lesions were metastatic cancers. Lung metastases are nodules of cancer originating from other sites in the body spreading through the blood steam, lodging and growing in the lung.

Of the primary cancers five were squamous cell, 17 were adenocarcinoma, and one was not otherwise specified. Of the metastatic cancers, the primary site was in the colon or rectum in 15, in the lung 11, breast 8, kidney 3, soft tissue 3 and elsewhere 3.

Tumor size ranged from 0.8 to 4.8 centimters (cm). There is 2.54cm in one inch. The median was 2.5cm. There were 3 patients who were unable to go through treatment. The number of radiation fractions varied between five and fifteen over one to three weeks. The dose was 3000 to 7500 centigray (cGy) thus each patient would have received about 500 to 600cGy per treatment. Centigray is a measurement of radiation dose. Most patients were treated over one to three weeks.

Seven of the 23 patients with non-small cell lung carcinoma received standard radiation first over approximately 5 to 6 1/2 weeks. The reason for this was the possibility of tumor extent and the concern that the tumor may recur locally.

Follow-up arranged from 3 to 31 months with a mean of 11 months. Results were called on the basis of local control. Either the cancer was controlled meaning it had stopped, shrunk or disappeared or it had not.

The researchers reported that all 45 patients were treated with no acute adverse effects immediately, although one patient had some appetite loss and four had a dry cough one to three months after treatment.

The authors noted that 2 of the 66 lesions showed local progression for a crude local progression rate of 3%. Conversely, the control rate locally - in the treated field - was 97%. At the time of writing 34 patients were alive, 11 had died. All deaths were said to be due to systemic metastases or other diseases.

Why deliver higher dose radiation for lung cancers? This is certainly a question asked of me frequently. These Japanese authors responded in the same manner stating, "The results of treating lung cancers with conventional radiation are not optimal and local failures are still common even in patients with small tumors. In such instances it is desirable to increase radiation doses to the tumor without increasing damage to the adjacent and normal tissue."

This feat is very difficult with conventional radiation therapy. New approaches such as three dimensional conformal radiation have been recently tried in the treatment of lung cancer. Yet having stereotactic technology allows better delivery of treatment and much more accurate set-up of the patient's position to assure the best outcome.

Stereotactic radiosurgery or stereotactic radiation which is the sophisticated improvement of 3-D "conformal radiation has already made this feat possible in the treatment of intracranial small lesions."

The authors have gone on to say that, "focal high dose and fractionated radiation therapy such as stereotactic radiation appears to have reached a reasonable approach for treating small lung cancers."

Minoru Uematsu concluded that, "judging from the preliminary evidence described in this report the treatment seems to be safe and promising and further exploration of this approach is warranted."

We certainly agree. Our group, as well, has control rates of 90% treating small as well as large tumors. Many of our patients have tumors measuring up to several thousand cubic centimeters and in addition we are often faced with treatment of patients that have already gone through standard chemotherapy/radiation or surgery yet have progressive disease. Our date includes many patients who have had extensive prior treatment and yet still respond favorably to body radiosurgery.

We as Minoru Uematsu believe that stereotactic radiation is here to stay. While it is not commonly available in this country, new data is being accumulated, presented and published on a frequent basis.

Lung cancer can have many presentations in the lung and beyond the lung – lymph nodes, mediastinum and elsewhere. Stereotactic body radiosurgery can be used to boost the dose of radiation to the cancer in the lung. This should help gain local control. By escalating the dose, our control rate rises to nearly 90% for primary lung cancers. This means that if the local control is greater, there should be a greater chance of cure. Stereotactic body radiosurgery can also be used to sites of metastases such as brain, lymph nodes, liver, adrenal glands and elsewhere. Control in these local sites is also very high. Control rate is defined as cessation of growth, shrinkage or disappearance of the tumor in the treated field.

We have seminars open to the public to explain stereotactic body radiosurgery in more detail. We also have a hot line at 212-CHOICES or send e-mail questions to gil.lederman@rsny.org.