

PROPHYLACTIC BRAIN RADIATION FOR THOSE WITH OAT CELL CARCINOMA

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In general, those with lung cancer are divided into two broad categories. One category is those patients who by biopsy have oat cell or small cell carcinoma. The other is non-small cell or non-oat cell cancer. Of course there are many different pathologic types of lung cancer. These distinctions are made because of the great difference in treatment and behavior of oat cell carcinoma compared to all others.

As a rule, oat cell is not considered to be a disease treated by surgery because there is usually microscopic disease well beyond the chest at the time of diagnosis. Anecdotally of course, there are some patients who have done well with surgical resection of oat cell cancer but this is not considered to be the standard of care. That remains a small group of patients confined to the history of medicine.

In the 1970's, authors noted that the vast majority of patients who underwent surgery actually had extensive disease noted at the time of autopsy. Despite that, this same decade was responsible for great advances in the development of chemotherapeutic treatment of oat cell carcinoma.

The aggressive approach to attempt to achieve cure had a radiation emphasis, as well. The rationale of prophylactic, or preventative, brain radiation for oat cell carcinoma was that chemotherapy did not penetrate well into the brain and a significant share of patients had recurrence of oat cell carcinoma in the brain after chemotherapy only.

Recently, Shaw et al in the Journal of Clinical Oncology analyzed the usefulness of cranial radiation based upon a Mayo Clinic study.

In the late 1970's and 80's, the authors noted ten randomized studies analyzing the usefulness of brain or cranial radiation and "eight of these trials demonstrated a significant reduction in the incidents of brain failure."

Subsequent authors suggested that brain radiation should only be performed in people whose cancer has completely gone away - that is, had a complete response.

The group from the Mayo Clinic retrospectively analyzed patients treated between 1975 and 1990. Work up was completed and included chest x-rays, liver scans, CT scans, bone scans and bone marrow evaluation. The patients, in general, received prophylactic radiation but to higher doses and in larger daily fractions than currently administered.

One thousand six hundred and seventeen patients were entered in these studies. Disease and oat cell carcinomas were confined to two categories - limited stage, meaning within a single radiation field and extensive stage, meaning the cancer has spread beyond this point.

Complete response was achieved in 59% of the patients with limited stage carcinoma and in 24% of the patients with extensive stage carcinoma. Not unexpectedly, patients with limited stage disease did better than those with extensive stage disease.

Prophylactic cranial radiation did not improve or worsen survival by analysis.

The cancer recurred in the brain in 37% of the patients with limited stage disease who had a complete response. This compared to the cancer coming back in only 9% in a similar group of patients who did, indeed, receive prophylactic brain radiation. Statistical analysis was performed which showed the importance of this.

Cancer recurred in the brain in 31% of those patients with extensive stage disease who had complete response but no brain radiation. If preventative radiation was administered in a similar group of patients, extensive stage with a complete response, only 8% of the cancer recurred in the brain. Again, this was statistically significant.

Of the patients who had severe brain toxicity, all received radiation doses of 3 gray daily or greater. This is an amount that has never been administered at Radiosurgery New York for exactly that reason. Lower daily fractions are better tolerated by the brain with a similar therapeutic effect.

The authors noted several other studies showing the reduction in brain metastases when prophylactic brain radiation was administered with a decrease in brain metastases ranging in one study from 22% down to 5% and in another study from 27% down to 0% recurrence. The author quoted one study by Rosen et al showing a diminishment in brain failure from 52% to 25% with an improvement in the two year survival rate (the percentage of patients alive) more than doubled.

The authors made several recommendations including "One - only patients who achieve a complete response should receive prophylactic cranial radiation. Two - the prophylactic cranial dose and fractionation schedule should be 25 gray in 10 fractions or an equivalent regimen using convention less than or equal to 2 gray fractions. Three - the oncologist's decision to give prophylactic cranial radiation should be based on the end point he/she chooses to consider important. Physicians who choose brain failure as an end point should recommend prophylactic cranial radiation, whereas those who choose survival should not. Four - patients should receive an Informed Consent form from which they can clearly understand that giving prophylactic cranial radiation might result in late sequelae, whereas not giving it might result in brain failure for which only modestly beneficial palliative therapy is available."

New studies are ongoing showing an improvement in survival using radiation to the chest early in the course of treatment for those with limited stage disease while more effective chemotherapeutic agents and regimens are being evaluated for those with extensive stage disease.

As always, for those with cancer the research is exciting. For those without lung cancer, cessation of smoking is the wisest maneuver.

The beauty of our technology is that even with whole brain radiation not everyone benefits. Fractionated stereotactic radiosurgery is a non-invasive method of administering very precise radiation to new or recurrent cancers. Many patients choose this technology to treat metastases to the brain even with small cell cancer after standard radiation. It also serves as a way to boost dose to larger metastases or more refractory metastases.

We have a large experience using fractionated stereotactic radiosurgery, which is a non-invasive, outpatient treatment for brain metastases. Also this technology – using body stereotactic radiosurgery – can be used for recurrent or new oat cell cancers that do not respond to traditional therapy. Body radiosurgery can even be used after chemotherapy/radiation or surgery. We have established a hot line at 212-CHOICES and also answer questions through e-mail: gil.lederman@rsny.org.

