Whole Brain Radiation for Brain Metastases

Radiation Oncologist Dr. Vivek Mehta reviews the concept of using whole brain radiation for multiple brain metastases, including how it is delivered and risks and benefits of this strategy.

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Transcript

I see a number of patients that come into my clinic with brain metastases, a situation where cancer has spread to their brain. Unfortunately in lung cancer, cancer spreads to the brain
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quite commonly. The first thing that we do is we try to image the brain to evaluate how many lesions we might see. Often times there are many lesions — 2, 3, 4, 5, sometimes ten or more lesions. When you have a situation where you have several lesions in the brain, you worry that there may be more lesions that you can’t see, that are simply too small to be detected on the imaging studies that we’ve had. In that situation, the standard of care is to offer patients something called whole brain radiation (WBRT).

Whole brain radiation often evokes fear in patients and their family members when they hear about this, because in principle what this is, is delivering radiation to the entire brain. What we do is we often give them a very low dose of radiation every day, Monday through Friday, over a period of a few weeks. There are various different schedules that you could use. Some people favor delivering this treatment over multiple visits, say over 20 visits in four weeks. Other people favor doing this over a shorter time interval, say ten treatments over two weeks. And of course there are always people in the middle that prefer a three week course of treatment.

In the studies that have been done, probably all of these have the same effectiveness in terms of controlling the cancer. The issue is that as you spread it out over a longer period of time, you’re probably a little bit more gentle on the brain than you would be if you were doing it over a shorter period of time. The longer period of time also has one other problem associated with that, and that is that we typically don’t want to give chemotherapy or systemic therapies at the same time as we’re delivering whole brain radiation, so sometimes we’re trying to get that treatment done quicker so we can get patients back on chemotherapy or systemic therapy.

When we deliver the whole brain radiation, the patients come into our department, they lay on a table and they often get a treatment that lasts somewhere in the neighborhood of 10 or 15 minutes. It’s a low dose of radiation delivered to the entire brain contents. They don’t see anything, feel anything, hear anything, they don’t glow in the dark, they’re not radioactive, nothing like that. They can go home and they can be safe with their family members. But over the course of that treatment, there are certain side effects that can occur. Patients can get tired, they can get a little bit nauseated, sometimes they can lose their hair or get scalp irritation, they can get the stuffy sensation in their ears as if that earwax is sort of plugging them up. Most of these symptoms we can manage with simple medicines.

Most of these symptoms tend to resolve a few weeks after the treatment and go away, but there are long-term side effects associated with that radiation as well. There could be permanent irreversible damage to the skin, the skull, the blood vessels, and the actual underlying brain parenchyma itself. Sometimes this long-term damage can actually manifest in terms of a significant deterioration in their quality of life. What I’m talking about is that there is a lot of data suggesting that there could be cognitive impairment from the radiation itself, or changes in their ability to think and mentate, or potentially even brain injury. This doesn’t happen very often, and this doesn’t happen very immediately, this tends to be a delayed effect of treatment. But this is a real but small risk, all that needs to be put in context of treating the underlying cancer.

Untreated cancer in the brain has the risk of strokes, it has the risk of bleeds, is can cause neurologic compromise, people can become symptomatic from that. We don’t have a lot of
very good alternatives to treating patients that have disease in their brain. If there are multiple spots we typically don’t do surgery because there’s too many places where we would have to operate, and the surgeon can’t get to the highways and byways in between. We try not to give chemotherapy, because historically, chemotherapy hasn’t crossed the blood-brain barrier and in any sort of sufficient fashion in order to get rid of the cancer successfully every time.

There are radiation techniques where you do pinpoint radiation just to certain spots in the brain, but they also don’t treat the spots in between, so often times we’re left with whole brain radiation. Over the years and the decades that we’ve been doing whole brain radiation, it’s been an effective treatment for many of these patients, and they tend to do well in terms of local control.

Now obviously, the bigger the size of tumor you have, the more symptomatic that you are, the less likely that this low dose of radiation of the whole brain will help sterilize everything, in which case there may be combinations that are employed: Whole brain radiation and pinpoint radiation, whole brain radiation and surgery, are some of the options that are used.