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Treating Brain Tumors with Immunotherapy

Announcer:
You're listening to ReachMD, and this is Advanced Treatments and Innovations from Mayo Clinic.

Here's your host, Dr. Jennifer Caudle.

Dr. Caudle:
Over the past decade, novel immunotherapy treatments have evolved the way we care for patients with cancer, but when it comes to treating brain cancer, which presents its own set of unique challenges, is immunotherapy still an effective treatment option to combat this complicated disease? Welcome to Advanced Treatments and Innovations from Mayo Clinic on ReachMD. I'm your host, Dr. Jennifer Caudle, and joining me is Dr. Ian F. Parney, who's a neurosurgeon with a special interest in malignant brain tumor surgery at Mayo Clinic in Rochester, Minnesota. Dr. Parney, welcome to you.

Dr. Parney:
Well, thank you very much, Dr. Caudle. It's a pleasure to be with you here today.

Dr. Caudle:
So, Dr. Parney, to start off, can you tell us how immunotherapy is used to treat cancer?

Dr. Parney:
Sure. Immunotherapy is essentially using the immune system to combat tumors to treat cancer directly with the immune system. Cancer is very good at suppressing the immune system normally. Otherwise our immune systems would actually be able to prevent us from developing cancer by eradicating those cancer cells almost as soon as they arise so immunotherapy is a means of trying to take advantage of that to treat the cancer. So, there's different types of immunotherapy. One type involves giving medications called immune checkpoint inhibitors, and these are medications that, that really take the brakes off the immune system and allow it to attack cancer cells more effectively. Other types of immunotherapies might involve making a vaccine to stimulate the immune system to attack cancer cells, and this is a bit funny for us cause when we think about vaccines, we're thinking about preventive vaccines like preventing measles or mumps or preventing COVID. Those are different from what we're talking about here. Here we're talking about a therapeutic vaccine where we want to stimulate the immune system to attack a tumor that's already there.

Dr. Caudle:
Excellent. And is this treatment option available for brain tumor patients?

Dr. Parney:
Yes. This is something that can now be part of standard treatment, and so the most common example of that would be a patient who has cancer that's spread throughout the body, but also it's spread to the brain, and they might get a treatment with an immune checkpoint inhibitor for that cancer in the body that is also effective to treat the, tumor in the brain itself if it's spread there. It also now is something that is being very aggressively tested in clinical trials for patients who have tumors that start in the brain like glioblastomas, so, yes, it's something that's available to almost any brain tumor patient.

Dr. Caudle:
And based on your experience, do you then think immunotherapy can successfully treat brain tumors?

Dr. Parney:

I really do. I think it's a very exciting time. For tumors that have spread to the brain from the body if the tumor in the body responds to the treatment, there's a very good chance that it'll respond in the brain as well. One of the issues that we have with treating brain tumors in general is that we have to deal with the blood-brain barrier, which can prevent medications getting from the body into the brain. That might actually be a little bit less of an issue, surprisingly, for immunotherapies than it is for other therapies because the immunotherapies really don't have to get to the brain tumor or into the brain itself. They have to get to the, the parts of the immune system, and particularly the white blood cells that are throughout the entire body, and those white blood cells can cross over into the brain tumor without any difficulty so we're already seeing for, things like metastatic tumors, the spread to the brain from the, body that the immunotherapy can be quite effective. For tumors that start in the brain like glioblastoma immunotherapies are still in clinical trials. We don't know all the answers yet. However, as somebody who's involved in running a number of immunotherapy clinical trials for glioblastoma patients, I can tell you that we're seeing some really exciting signs that this could be effective.

Dr. Caudle:
That's very exciting. For those of you who are just joining in, this is Advanced Treatments and Innovations from Mayo Clinic on ReachMD. I'm your host, Dr. Jennifer Caudle, and today I'm speaking with Dr. Ian F. Parney about treating brain tumors with immunotherapy. So, Dr. Parney, now that we've covered immunotherapy's role in brain cancer, let's take a step back and discuss immunotherapy itself. First of all, can it cause any side effects that we should be aware of?

Dr. Parney:
Well, yes. I'm reminded actually of one of my professors of pharmacology in medical school who said that any treatment, any medication that doesn't cause side effects, it's probably not doing anything at all, and so immunotherapies are really doing something, and so, yes, they can have side effects. Often these are pretty mild, for example, somebody might get a, a mild fever for a few hours after getting a vaccine or swelling at a vaccine site with some redness there but they can also be more significant. Particularly for some of these medications called immune checkpoint inhibitors, we've seen patients develop autoimmune processes so their immune system gets revved up against the tumor, but it might also get revved up against something else in the body and they might have for example an autoimmune process affecting their lungs that makes it a little bit more inflamed or even some swelling and inflammation in the, the brain itself. So, we have ways to manage these, and usually it's just simply stopping the, the immunotherapy is enough but they are things that we have to watch for with these treatments.

Dr. Caudle:
And how does this therapy fit with other treatments, such as surgery, radiation, and chemotherapy?

Dr. Parney:
Well, I think it's actually becoming increasingly evident that it's really important to tie immunotherapies into those treatments. For some types of, of tumors in the body, melanoma, for example, or some types of lung cancer a single immunotherapy, a single immune checkpoint inhibitor by itself can sometimes have pretty significant effects and benefits for patients, but for tumors that start in the brain like glioblastoma, we've really not seen that. In fact, we've seen some pretty good evidence that those types of immune checkpoint inhibitors do not work as single treatments by themselves for tumors in the brain, but when we combine those immune checkpoint inhibitors or other immunotherapies with standard treatments like surgery and radiation and chemotherapy, we get more benefit. They synergize. We get more benefit from that combination than we would get from any of those individually and the reason for that is still being actively investigated, but a simple way to maybe think about it is that if we do something like surgery or radiation or chemotherapy that causes the tumor cells to die and so it's working effectively that way, we're also releasing the proteins from those dying tumor cells onto the immune system, which we've then primed by other immunotherapies, and so it really does look like the, combinations of these treatments actually are much more effective or have the potential to be much more effective than having any single treatment by itself.

Dr. Caudle:
And finally, Dr. Parney, if there's one key takeaway that you'd like our audience to bring home regarding immunotherapy and brain tumors, what would that be?

Dr. Parney:
I would want people to recognize that this is an incredibly hopeful time for patients with brain tumors particularly tumors like glioblastomas. My life's work has been dedicated to looking after patients with brain tumors like this. The prognosis has gotten better over time, but we have a long way to go. Immunotherapy has just revolutionized cancer care in the last five to ten years, and that revolution is now coming to brain tumor patients. I'm really excited about that and the hope that that's bringing. I think we're gonna see some really significant strides.

Dr. Caudle:

Well, with those key takeaways in mind, I'd like to thank my guest, Dr. Ian F. Parney, for joining me to discuss immunotherapy for brain tumors. Dr. Parney, it was great having you on the program.

Dr. Parney:
Thank you very much. It was wonderful to be able to share some of this with you.

Announcer:
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