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Brain Tumors: Current Treatments and Hope for the Future

Presented by

Jeffrey Bruce, MD

Columbia Presbyterian Medical Center

Julie Martin, LMSW

CancerCare

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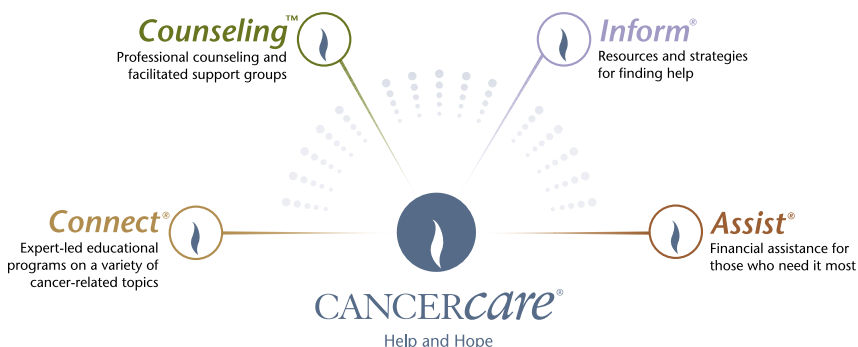
- Advances in treatment
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Contacting CancerCare

National Office

CancerCare
275 Seventh Avenue
New York, NY 10001
Email: teled@cancercare.org

Administration

Tel: 212-712-8400
Fax: 212-712-8495
Email: info@cancercare.org
Website: www.cancercare.org

Services

Tel: 212-712-8080
1-800-813-HOPE (4673)

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Brain Tumors: Current Treatments and Hope for the Future

Presented by

Jeffrey Bruce, MD

Professor of Neurosurgery

Columbia University College of Physicians and Surgeons

Program Co-Director for Neuro-Oncology

Columbia Cancer Center

Director, Bartoli Brain Tumor Research Laboratory

Columbia Presbyterian Medical Center

New York, NY

Julie Martin, LMSW

Clinical Oncology Social Worker

CancerCare

The information in this booklet is based on the CancerCare Connect[®] Telephone Education Workshop “Glioblastoma: Current Treatments and Hope for the Future,” which took place on December 2005.

The workshop was conducted by CancerCare in partnership with the American Brain Tumor Association, Association of Oncology Social Work, Brain Tumor Society, Intercultural Cancer Council, Multinational Association of Supportive Care in Cancer, and National Brain Tumor Foundation.

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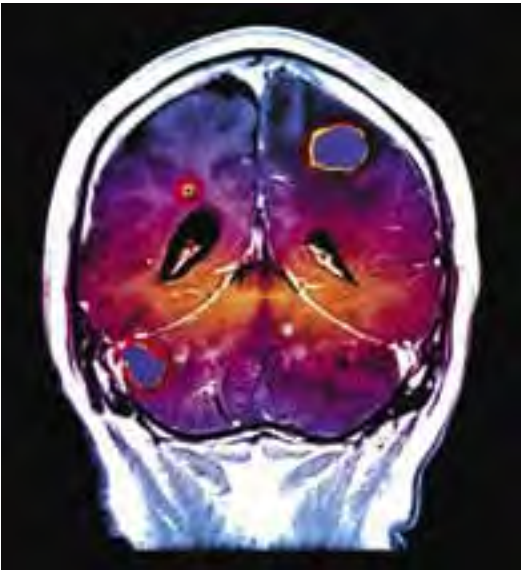
This patient booklet was made possible by an educational grant from Schering Corporation.

New techniques and new medications all point toward better treatment of brain tumors.

Most brain tumors are cancers that have spread from their original site—in a breast or lung, for example. But each year, more than 18,000 people in the United States are diagnosed with a cancer that begins in the brain, a more rare form of brain tumor. In this booklet, we'll talk about the new ways that doctors are finding to treat these **primary brain**

tumors, giving hope to patients and their families. About 60 percent of those tumors are called **glioblastomas**, the most aggressive and common form of primary brain cancer.

Nobody knows what causes primary brain tumors. Researchers have studied many possible causes, such as cell phone use, exposure to certain viruses, and radiation treatment. Still, none has been shown to cause brain cancer.



An image of the brain produced by MRI (magnetic resonance imaging, described on page 3). The yellow rings in this photograph indicate the locations of brain tumors.

Signs and Symptoms of Brain Tumors

Warning signs of brain cancer include:

General signs and symptoms

- Headaches
- Seizures
- Changes in personality
- Memory lapse
- Nausea and vomiting
- Changes in vision

Specific signs and symptoms, depending on the location of the tumor

- Pressure or headache
- Loss of balance
- Impaired fine motor skills, such as ability to type
- Impaired judgment
- Muscle weakness or paralysis
- Changes in speech, hearing, memory, or emotional state
- Problems understanding or retrieving words
- Extreme sensitivity to touch
- Arm or leg weakness on one side of the body
- Confusion about left and right sides of the body

The symptoms of brain tumors vary. Sometimes a tumor causes a general symptom such as a headache. This is due to the pressure that a tumor can place on the brain. In other cases, the tumor causes more specific symptoms related to its location. For example, a tumor found in the part of the brain that controls movement may cause muscle weakness.

When doctors suspect a brain tumor, they usually perform a test called **MRI**, short for **m**agnetic **r**esonance **i**maging. An MRI uses magnetic fields to take “pictures” inside the body to detect a tumor.

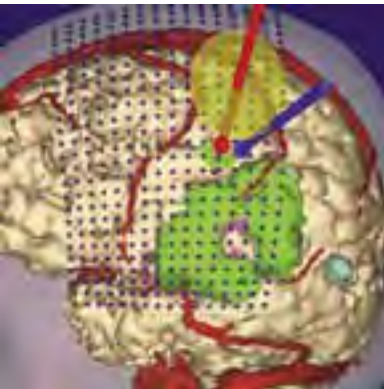
If a tumor is found, the next step is to determine whether it's cancerous. In some cases, the tumor can be removed with surgery. But if the tumor is located in a part of the brain that is difficult to reach with surgery, a **biopsy** may be done. For this test, a small piece of the tumor is removed and examined under a microscope to look for cancer cells. Using sophisticated devices that guide a needle through the skull, doctors can perform safe brain biopsies.

Treating Brain Tumors

As with most cancers, there are three main treatments for brain tumors that are used alone or in combination: surgery, radiation, and chemotherapy (anti-cancer drugs).

SURGERY

Many brain tumors are surgically removed using a procedure called a **craniotomy**. The surgeon opens the skull and removes as much of the tumor as possible. Recent advances have improved the safety of this type of surgery. For example, special computers hooked up to MRI monitors allow surgeons to view a “map” of different parts of the brain. The map helps them find and remove tumors more easily and safely.



Computerized **brain mapping** before surgery to remove a tumor (shown in green).

Another type of “surgery” uses radiation instead of a scalpel to treat some types of brain tumors. Radiation reduces the size of tumors and in some cases eliminates them. This technique is called **stereotactic radiosurgery**. For this method, a computer assembles images from **CAT** scans, MRI scans, or both to locate the tumor and help direct the radiation beams. In this way, a single, high dose of radiation is aimed at the tumor, sparing healthy tissues.

After conventional surgery, doctors usually prescribe prednisone or other **steroids** to reduce swelling in the brain. (These drugs are rarely needed after radiosurgery.) The swelling may be caused by the tumor itself or the surgery. Steroid drugs are very effective in reducing swelling. Because they are powerful medications, the use of steroids must be monitored carefully by a doctor. These drugs are an essential part of improving a patient's quality of life and reducing symptoms such as seizures, memory problems, or confusion that may result from brain tumors and treatment.

RADIATION

After a cancerous brain tumor is removed using conventional surgery, the surrounding area of the brain is treated with radiation. (Patients who have had radiosurgery may receive additional radiation if needed, but only if they have not already had such treatments.) Radiation is used because even if a tumor is removed, some microscopic cancer cells may be left behind. These cells can act as seeds, sparking growth of another tumor. Radiation helps get rid of these cells.



People with brain tumors typically get about 30 radiation treatments, spaced over the course of about six weeks. The treatments take only a few minutes a day.

Some people feel tired after getting radiation. And, some people who have had radiation to the scalp may feel skin irritation or lose their hair in the area receiving radiation. The hair may not grow back, but most of the other side effects go away with time or can be treated with medications.

CHEMOTHERAPY

The latest standard of care for patients with glioblastoma is radiation plus temozolomide (Temodar), which can be taken by mouth. After radiation treatment is finished, people often continue taking temozolomide for as long as may be

necessary. Currently, the goal of this drug is to keep the tumor stable, stopping it from growing any farther. Researchers feel encouraged by a recent development concerning temozolomide. By examining brain tumor tissue under a microscope, they can predict, to some degree, which tumors are likely to be treated most successfully by the drug. Although chemotherapy can cause side effects such as nausea or fatigue, today doctors prescribe drugs that can reduce and even prevent these symptoms.

Coping with Side Effects of Chemotherapy

In recent years, the experience of chemotherapy has improved dramatically. In the past, some patients chose not to take chemotherapy because of the side effects it could cause. But today, doctors prescribe medications that reduce and even prevent these symptoms. Talk to your doctor if you experience:

Nausea or vomiting There are drugs that prevent vomiting and quell both a queasy stomach and the “anticipatory nausea” that can occur even before chemotherapy starts.

Loss of appetite Steroid medications can increase muscle and weight gain and stimulate the appetite.

Fatigue If the source of the fatigue is anemia (a low red blood cell count) or an infection, it can be treated with specific medications. Taking a nap or doing gentle exercise can also help overcome the feeling of weariness.

Pain New pain medications and new methods of delivering pain medicine—through a patch, lozenge, or surgically implanted device—offer relief. A procedure that blocks pain nerves has also proved highly effective.

For more information, request a copy of the CancerCare Connect® booklet *Understanding and Managing Chemotherapy Side Effects* by calling 1-800-813-HOPE (4673).

New Treatments on the Horizon

There are now a number of promising leads in the research on brain tumors:

- **Antiangiogenesis drugs** Brain tumors develop very strong networks of blood vessels that feed tumor growth. The growth of these blood vessels is called **angiogenesis**. Researchers are working on a number of drugs that block development of these blood vessels.
- **Convection-enhanced delivery chemotherapy** When anti-cancer drugs are given in pill form or through a vein, they have to travel throughout the body before getting to the brain. As the drugs travel, they can cause side effects such as nausea. **Convection-enhanced delivery chemotherapy** is a new technique in which doctors put a tiny tube into a brain tumor and connect the tube to a pump. This allows them to deliver large doses of chemotherapy directly into the brain, preventing the side effects that occur when the drugs travel throughout the whole body.
- **Gene therapy** Researchers are trying to pinpoint specific genes that cause brain tumor growth. Once the genes are identified, researchers hope to find ways to “turn them off,” so they won’t promote cancer.
- **Immunotherapy** When you develop a tumor, your body tries to get rid of it by mounting an **immune response**. It’s similar to the way the body fights infection. But usually, this response is not strong enough to stop tumor growth. Researchers are trying to find ways to strengthen this response, so it is better able to stall tumor growth.

Researchers are continually looking at new ways to treat brain cancer. For people whose brain tumors have grown back after standard treatment, joining a clinical trial can be a good way to continue treatment. Your doctor can tell you about clinical trials for which you may be eligible. You can also go online for more information. See our list of resources on page 16.

The Importance of Clinical Trials

There's no question that clinical trials have led to advances in cancer treatment, creating a brighter future for all people with cancer. Clinical trials are the standard by which we measure the worth of new treatments and quality of life as patients go through those treatments. For this reason, doctors and scientists urge patients to take part in clinical trials.

Your doctor can guide you in making a decision about whether a clinical trial is right for you. Here are a few things you should know:

- Often, patients who take part in clinical trials gain access to and benefit from new treatments.
- Before you participate in a trial, you will be fully informed as to the risks and benefits of the trial.
- No patient receives a placebo or “dummy pill” if there is a standard treatment available for the disease. Most trials are designed to test a new treatment against a standard treatment to find out whether the new treatment has any additional benefit.
- You can stop taking part in a clinical trial at any time for any reason.

Coping with Brain Tumors

When you're first diagnosed with a brain tumor, it's like suddenly finding yourself in an unfamiliar environment. The language is new, the customs aren't clear, you're not sure what to expect from those around you. You and your family can feel a swirl of emotions. With brain tumors, events can unfold fairly quickly. The key to finding your way is to gather information and ask for help so you can make the best and most timely decisions for yourself. Here are some ways to navigate around this new terrain:

Do your research The internet is a great place to start, but even if you're not computer savvy, a lot of information is available through the mail and by telephone. Organizations such as CancerCare offer free—and reliable—information. Visit www.cancerca.org or call 1-800-813-HOPE (4673). CancerCare has worked with the American Society of Clinical Oncology on a website called People Living with Cancer (www.plwc.org). For more resources, see page 16.

Get a second opinion Have another doctor look at your scans and review your case. Most academic medical centers have a tumor board where patients' cases are detailed to all the doctors present. Having your case shown to such a board is a good way to get a lot of feedback at one time.

Speak up When you talk with your doctor, it's important to remember that he or she is the expert in biology and medicine, but you are the expert about your own life. Don't be afraid

to bring up any topic of concern to you. Your doctor can't treat a problem if you don't make him or her aware of it. Doctors now understand, better than ever before, that patients are concerned about good quality of life as they go through treatment.

Keep a notebook Write down your questions and keep notes on your doctor's answers to them. If possible, have a friend or family member come with you when you visit your doctor to help you get the information you want and ask questions you might not think of.

Questions to ask your doctor:

- What are my treatment options?
- What are the risks and benefits of the recommended treatment?



- What research has been done on this treatment?
- What are the likely side effects?
- Can treatment wait?
- What will happen if there is no treatment?
- Who is the key nurse or doctor I can talk to if there's a problem?



Realize that it's normal to go through changes

Having a brain tumor and being treated for it can affect your mood, memory, ability to think clearly, and other important areas of your life. It can also affect the way you feel about yourself and how you view the future. It's perfectly normal to feel sad, angry, afraid, or frustrated and to ask for help with these feelings. The more you learn about your condition, the better you can manage and adapt.

Seek the help of a social worker or an oncology nurse practitioner

People and their families who are coping with a brain tumor diagnosis need someone to talk with who can help them sort through all the complex emotions and issues that arise. These health care professionals can provide emotional support, help you deal with your treatment and its side effects, and guide you to other resources. CancerCare offers free counseling from professional oncology social workers on staff.

Join a support group

You and your family members may benefit from a support group, which can reduce the feeling that you are going through cancer alone. Support groups focus on coping and living with a cancer diagnosis. They provide role models, reassurance, suggestions, and insight, allowing you to share similar concerns with your peers in a safe and supportive environment.

Frequently Asked Questions

Q I'm concerned about my husband having to take steroids as part of his treatment. Aren't there a number of side effects?

A Many people think of steroids in a negative way because of their misuse by some athletes, for instance. But in the case of people with brain tumors, steroids are an important part of treatment. While it's true that steroids can cause such side effects as weight gain, mood swings, or muscle weakness, in some cases they also play a vital role in reducing swelling in the brain and seizures, for example. The key thing to remember is that your husband and his doctor need to work together to arrive at the right dosage—one that maximizes the benefits while minimizing the side effects. When you weigh the positive against the negative, it's easier to understand why doctors rely on steroids to help their patients with brain tumors.

Q Should I be taking medication to prevent seizures?

A People often worry about seizures because these episodes can occur with brain tumors. Although your risk of seizure is higher with a brain tumor, medication is not necessary unless you have previously had a seizure. Aside from steroids, the medication most commonly prescribed to prevent seizures is phenytoin (Dilantin).

Q At a support group I belong to, some people were talking about a clinical trial to test a treatment that allows drugs to cross the blood-brain barrier. What exactly is that?

A This protective barrier is made up of blood vessels and glia (a type of brain cell) that are designed to keep out toxic substances. Unfortunately, the blood-brain barrier can also keep anti-cancer drugs from reaching tumors in the brain. One treatment designed to cross this barrier involves placing a tiny tube into the brain and pumping drugs through it. This technique is called convection-enhanced delivery. (See page 7 for more information.)

Another treatment makes use of medications that help “open” the brain’s blood vessels, allowing them to take up chemotherapy. These drugs can be given intravenously—through a vein—right before chemotherapy. They help the anti-cancer drugs reach the blood vessels of the brain.

Another technique involves placing one or more dime-sized disks called Gliadel wafers into the area of the brain where the tumor was removed by the surgeon. The wafer slowly dissolves and releases a powerful anti-cancer drug into the area to kill any tumor cells that might have been missed during surgery. However, with this method, the drug doesn’t reach very far into the brain, so it may not kill all the tumor cells.

Q I had radiation for a brain tumor several months ago. On my last follow-up MRI, I had some unusual new spots in different areas of my brain. My doctor says they are not cancerous, but she wants to keep an eye on them. What is going on?

A Radiation has many effects on the brain. Some of these effects may show up as “spots” on an MRI scan. If a tumor develops in one of the spots later, it means that tumor cells may have traveled through the brain and settled in that

particular spot. Nobody knows why the cells grow and become a tumor in a certain area. At this point, it's important to heed your doctor's advice and continue with your follow-up care.

Q I've just finished treatment for a brain tumor. Even though my doctors say the treatment was effective, could my brain tumor come back?

A There is always a chance that a brain tumor will grow back. After treatment, it's important that you and your doctor work out a follow-up plan to help you stay involved in your care. Even if you feel great and everything seems to be going well, you need to stay in touch with your doctors and follow their advice.

Also, remember that you are not alone. Feeling worried about a cancer recurrence is the number one issue people face when they finish treatment. Learning how to manage this concern will help you continue living your life in a meaningful way. Groups such as CancerCare can help.

Glossary

angiogenesis Growth of the blood vessels that feed cancerous tumors. “Angio” comes from the Greek word for vessel, and “genesis” refers to the creation of blood vessels.

biopsy Removal of a small piece of tissue. The tissue is examined under a microscope to look for cancer cells.

blood-brain barrier A protective layer of blood vessels and glia (a type of brain cell) that are designed to keep out toxic substances, including drugs. The barrier must be crossed in order for chemotherapy to reach brain tumors. Other medications, given intravenously (through a vein), can be added to anti-cancer drugs to open the barrier and allow chemotherapy to enter.

brain mapping A computerized technique to pinpoint tumors so that surgeons can remove them more easily and more safely.

CAT scan CAT stands for “computed axial tomography.” It’s a special type of x-ray study used to detect the spread of disease or track the progress of treatment.

convection-enhanced delivery chemotherapy A new technique in which doctors put a tiny tube into a brain tumor and connect the tube to a pump. This allows them to deliver large doses of anti-cancer drugs directly into the brain, preventing the side effects that occur when the drugs go throughout the whole body.

craniotomy A surgical procedure in which the skull is opened, in this case to remove a brain tumor.

glioblastomas The most aggressive and common form of primary brain tumor (see definition on page 15).

immune response The body's response to invasion by a foreign substance, such as a virus or cancer cells. It is the body's attempt to get rid of the invader.

MRI (magnetic resonance imaging) uses magnetic fields to take "pictures" of the inside of the body to detect the spread of disease or track the progress of treatment.

primary brain tumors These tumors begin in the brain. They are less common than brain tumors that spread to the brain from a cancer in another part of the body such as the breast or lung.

stereotactic radiosurgery For this method, a computer assembles images from CAT scans, MRI scans, or both to locate the tumor and help direct the radiation beams. In this way, a single, high dose of radiation is aimed at the tumor and not healthy tissues.

steroids Drugs commonly taken to reduce swelling in the brain.

Resources

CancerCare

1-800-813-HOPE (4673)

www.cancercares.org

American Brain Tumor Association

1-800-886-2282

www.abta.org

American Cancer Society

1-800-227-2345

www.cancer.org

National Brain Tumor Foundation

1-800-934-2873

www.braintumor.org

National Cancer Institute

Cancer Information Service

1-800-422-6237

www.cancer.gov

People Living with Cancer

www.plwc.org

To find out about clinical trials:

Coalition of Cancer Cooperative Groups

www.CancerTrialsHelp.org

National Cancer Institute

www.cancer.gov/clinicaltrials



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The information presented in this patient booklet is provided for your general information only. It is not intended as medical advice and should not be relied upon as a substitute for consultations with qualified health professionals who are aware of your specific situation. We encourage you to take information and questions back to your individual health care provider as a way of creating a dialogue and partnership about your cancer and your treatment.

All people depicted in the photographs in this booklet are models and are used for illustrative purposes only.

MRI brain scan on page 2: Neil Borden/Photo Researchers, Inc.; presurgical computer map of brain and tumor on page 4: MIT AI Lab/Surgical Planning Lab/Brigham & Women's Hospital/Photo Researchers, Inc.; photo of patient being prepared for radiotherapy on page 5: Simon Fraser/Photo Researchers, Inc.

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