



FOCUSING ON TUMORS

Sharing knowledge. Sharing hope.

# *Oligodendroglioma and Oligoastrocytoma*



American Brain Tumor Association

2720 River Road, Suite 146 Des Plaines, Illinois 60018

800.886.2282 TEL info@abta.org EMAIL  
847.827.9918 FAX www.abta.org WEB

American Brain Tumor Association

# A Word About ABTA

Founded in 1973, the not-for-profit **American Brain Tumor Association** has a proud history of funding research, providing patient services, and educating people about brain tumors. Our mission is to eliminate brain tumors through research and meet the needs of brain tumor patients and their families.

We gratefully acknowledge Deneen Potter Hesser RN, BS, OCN for the writing of this publication. We also appreciate the volunteer efforts of Nina A. Paleologos, MD, Assistant Professor of Neurology, Northwestern University Medical School and Co-Director, Neuro-Oncology Program, Evanston Hospital, Evanston, Illinois for technical review. We also express our thanks to M. Anne Edwards for the original edition of this publication.

This publication was made possible through the generosity of: BSI Ltd. in honor of Mark N. Nagan; the Doran Family; Robert Richards; Mr. & Mrs. Jay Schroeder; Chelle S. Lancaster's family honoring her remarkable spirit and positive attitude during treatment for her oligodendroglioma; Stephen D. West; and donations in memory of Heidi Schechter Moldo and Robert Jon Riechers, MD.

ISBN 0-944093-60-4

COPYRIGHT © 1988, 1989, 1992, 1996, 2001 ABTA

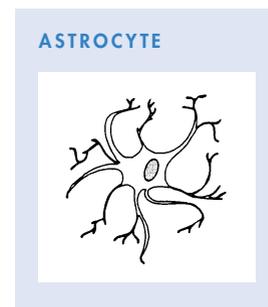
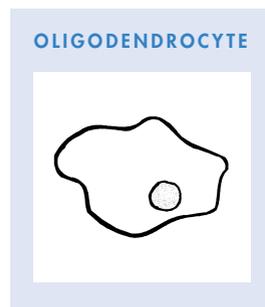
REPRODUCTION WITHOUT PRIOR WRITTEN PERMISSION IS PROHIBITED.

# Introduction

This publication is about oligodendroglioma and oligoastrocytoma (tumors which are a mix of oligodendroglioma and astrocytoma). If your questions are about another type of tumor, please call us for a copy of *A Primer of Brain Tumors*.

“Glial” tissue is the supportive, or nourishing, tissue of the brain. Any tumor of this tissue is called a *glioma*. There are several types of gliomas.

- *Oligodendrogliomas* are gliomas that arise from oligodendrocytes — fried egg shaped cells within the brain. These cells normally form the covering layer of nerve fibers in the brain.



- *Astrocytomas* are gliomas that arise from astrocytes — star-shaped cells within the brain. Astrocytes store information and nutrients for nerve cells in the brain.
- *Oligoastrocytomas* are “mixed gliomas” containing both oligodendroglioma and astrocytoma cells.

Oligodendrogliomas are generally soft, greyish-pink tumors. They often contain mineral deposits (called calcifications), areas of hemorrhage, and/or cysts. These tumors may be “graded” to describe the appearance of their cells when viewed under a microscope. Using the World Health Organization classification system, oligodendrogliomas and oligoastrocytomas can be either grade II or grade III tumors.

## CT SCAN OF A OLIGODENDROGLIOMA



**CT scan showing an extensively calcified oligodendroglioma located in the right temporo-occipital area. The small light areas in the front of both anterior horns are also tumor.**

*Reprinted from Pathology and Genetics: Tumours of the Nervous System, IARC Press, Lyon France with permission of Drs. Manfred Westphal, Paul Kleihues, and Webster Cavenee.*

## Incidence

About 4% of primary brain tumors are oligodendrogliomas, representing about 10-15% of the gliomas. Only 6% of these tumors are found in infants and children. However, these tumors may be more common than generally thought since newer biologic markers now help pathologists separate oligodendrogliomas from other types of tumors. Most oligodendrogliomas occur in adults ages 50-60, and are found in men more often than than women.

## Cause

The cause of these tumors, as well as other types of brain tumors, is unknown. Scientists have identified abnormalities on chromosomes 1p and 19q which may play a role in the development of oligodendroglioma and oligoastrocytoma. In addition, anaplastic tumors appear to have abnormalities on chromosome 9 or 10, along with unusual amounts of growth factors and gene proteins. Those substances are thought to control the growth of blood vessels around a tumor.

Researchers believe that both oligodendrogliomas and astrocytomas may originate from one mother cell whose “offspring” follow two different developmental pathways. This research may help explain the biologic relationship between the two tumor types. However, the initial steps which change these cells from normal to abnormal still are uncertain.

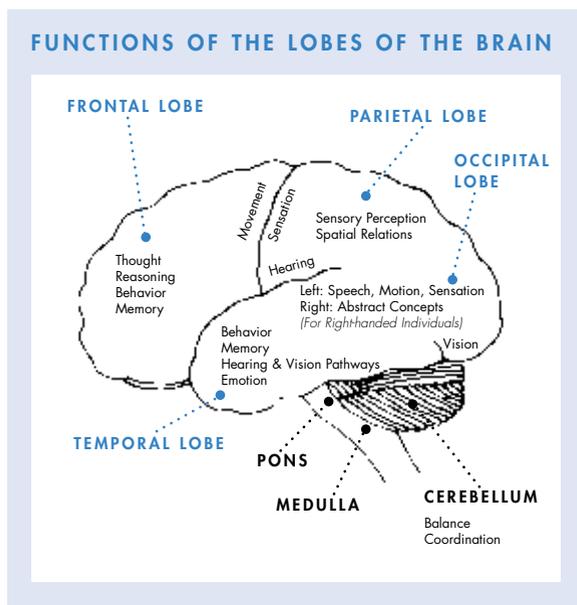
The cells of a grade II tumor are referred to as “well-differentiated” — they appear slightly abnormal when compared to normal cells. These tumor cells reproduce at a slow rate. Grade III tumors are “anaplastic” tumors. The cells of these tumors are definitely abnormal in appearance. Anaplastic tumors tend to contain many blood vessels and cells capable of quickly reproducing. Some anaplastic oligoastrocytomas contain glioblastoma cells which are grade IV, aggressive cells.

## Symptoms

Because of their generally slow growth, oligodendrogliomas are often present for years before diagnosis. The most common symptoms are seizures, headaches, and personality changes. Other symptoms vary by location and size of the tumor.

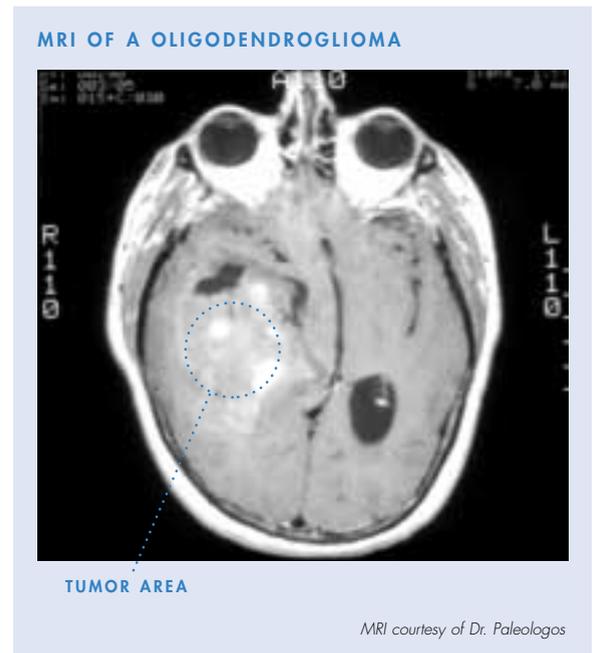
These tumors can be found anywhere within the cerebral hemispheres of the brain, although the frontal and temporal lobes are the most common locations. Tumors of the frontal lobe may cause weakness on one side of the body, personality or behavior changes, and difficulty with short term memory. Temporal lobe tumors are usually “silent,” causing few symptoms other than perhaps seizures or language problems.

If you would like to learn more about the symptoms of brain tumors, please see our book, *A Primer of Brain Tumors*.



## Diagnosis

After a neurological examination, MRI and/or CT scans are ordered. The calcification sometimes present in an oligodendroglioma may be seen on a CT scan and suggests the diagnosis. However, only examination of a sample of tumor tissue by a pathologist confirms the exact diagnosis and leads to appropriate treatment.



## Treatment

### SURGERY

Surgery is the primary treatment for an oligodendroglioma or oligoastrocytoma if it is located in an accessible area of the brain. An “accessible” tumor is one that can be removed without causing severe neurological damage. Numerous tools are available to assist the neurosurgeon in tumor removal. Computer-guided stereotactic navigational systems can

help define the exact tumor location, and brain mapping techniques may help outline vital parts of the brain to be avoided during surgery. Even with the use of these tools however, some tumors can be only partially removed because of their location. If the tumor is inoperable, a biopsy will be done to confirm the exact diagnosis.

## RADIATION

For an adult with an anaplastic tumor or an oligoastrocytoma, radiation therapy may follow surgery. If your tumor is an oligodendroglioma, your doctor will determine if radiation therapy is recommended at this time.

There are different types of radiation which use various doses and schedules. Most forms of radiation, however, are aimed at the tumor and a small area around the tumor. Conventional external beam radiation is “standard” radiation given 5 days a week for 5 or 6 weeks. A form of “local radiation” may be used to boost conventional radiation. Stereotactic radiosurgery aims converged beams of radiation at the tumor. Conformal photon radiation (intensity-modulated radiation therapy) shapes radiation beams to the shape of the tumor. Interstitial radiation, also called brachytherapy, may be implanted into the tumor during surgery. Monoclonal antibodies may be capable of carrying radiation or drugs to the tumor site.

*Some treatments are investigational and are offered in organized testing plans called “clinical trials.” Your doctor can tell you if the treatment you are considering is a standard treatment or an investigational treatment.*

## CHEMOTHERAPY

PCV — the combination of the drugs procarbazine, lomustine (CCNU) and vincristine — has been found to be an effective treatment for both anaplastic oligodendrogliomas and anaplastic oligoastrocytomas. Some physicians also use PCV for lower-grade oligodendrogliomas. About 60-65% of oligodendrogliomas respond to chemotherapy, but scientists are unclear as to which tumors will respond and which will not. New tests being developed may help better predict the effectiveness of chemotherapy in this group of tumors. In anaplastic oligodendrogliomas, loss of the chromosomes 1p and 19q is strongly associated with chemosensitivity. While most experience is with PCV, a newer drug, temozolomide, is being increasingly used in people with oligodendroglial tumors.

Chemotherapy may be used in infants and very young children to delay radiation therapy until the age of three or four. Clinical trials are underway to evaluate the most effective ways of treating these tumors in infants and children.

There are several drugs used to relieve the symptoms of a brain tumor. Steroids are drugs used to decrease swelling (edema) around the tumor. Anti-epilepsy drugs control seizures. Anti-emetic drugs prevent vomiting and help control nausea. Additional suggestions for managing side-effects are in our publication, *A Primer of Brain Tumors*.

**Just as in treating any disease, treatment for a brain tumor may have side effects. Ask your doctor to talk with you and your family about these potential effects. He or she can also help you balance the risks of treatment against the potential benefits.**

## Recurrence

Tumors recur when all the tumor cells cannot be removed by surgery or killed by other treatments. Over time, those cells multiply and result in tumor regrowth. A tumor may recur as a higher grade tumor. It may contain a greater percentage of anaplastic cells, more astrocytoma cells, or the tumor may spread within the brain or into the spinal canal. However, because many oligodendrogliomas are slow growing tumors, it may be years before regrowth occurs.

Treatment for a recurrent tumor may be additional surgery, radiation therapy if the tumor was not previously radiated, or a form of local radiation if the tumor was previously radiated. There are also many clinical trials open to those with a recurrent tumor. Chemotherapy using drugs such as temozolomide or CPT11; new combinations of drugs; high-dose drugs used with a bone marrow transplantation; or biodegradable wafers soaked with chemotherapy drugs may all be considered. Anti-angiogenesis drugs are thought to interfere with the growth of new blood vessels which feed a tumor. Monoclonal antibodies (MOAB) are immune substances which may be capable of killing cells themselves, or they may serve as a delivery vehicle for drugs or radioactive products.

## Finding Clinical Trials

Many investigational treatments — called clinical trials — are available to patients with an oligodendroglioma or an oligoastrocytoma. To find out more about these studies contact the National Cancer Institute's Cancer Information Service at 800-422-6237. They can provide you with detailed information about brain tumors as well as a listing of clinical trials specific to your

type of tumor. We maintain a resource listing of physicians participating in clinical trials for brain tumors, including oligodendrogliomas. Our office can be reached at 800-886-2282.

## Prognosis

How well a patient responds to treatment is affected by their age, location of the tumor, grade of the tumor cells, and the amount of tumor that was able to be removed during surgery. Well-differentiated oligodendrogliomas tend to be lower grade, slow growing tumors. Anaplastic oligodendrogliomas are more aggressive, faster growing tumors. The outcome for those with an oligoastrocytoma depends on the percent of astrocytoma versus oligodendroglioma in the tumor, and the most aggressive type of cell found in the tumor.

Published survival rates for these tumors may not yet reflect the recent positive impact of chemotherapy. If you have an oligodendroglioma, your doctor is the best person to answer questions about the expected outcome. He/she can provide you with information specific to your tumor. When considering a therapy, ask your doctor how the recommended treatment will affect your prognosis. What are the expected benefits of this treatment? What are the risks? What quality of life can you expect during and after the treatment? If this is an investigational treatment, how many patients with your tumor type have received this treatment, and what were their results?



# Questions I Want to Ask

# Publications & Services

## BUILDING KNOWLEDGE

A Brain Tumor — Sharing Hope  
Tumor del Cerebro — Compartiendo la Esperanza  
Dictionary for Brain Tumor Patients  
Living with a Brain Tumor  
A Primer of Brain Tumors

## FOCUSING ON TUMORS

Ependymoma  
Glioblastoma Multiforme and Anaplastic Astrocytoma  
Medulloblastoma  
Meningioma  
Metastatic Brain Tumors  
Oligodendroglioma and Oligoastrocytoma  
Pituitary Tumors

## FOCUSING ON TREATMENT

Gene Therapy  
Radiation Therapy of Brain Tumors: A Basic Guide  
Stereotactic Radiosurgery

## FOR & ABOUT CHILDREN

Alex's Journey: The Story of a Child with a Brain Tumor  
*(for ages 9-13, video and booklet formats)*  
When Your Child Returns to School

## SUPPORT RESOURCES

A Bibliography of Books & Resources  
Brain Tumor Survivor's Guide to the Internet  
Care Options  
Emergency Alert Wallet Cards  
Financial Aid Resources  
Housing During Treatment Resources  
Organizing a Support Group  
Scholarship & Educational Financial Resources  
Support Group Listings  
Transportation Resources  
Wig and Head Covering Resources  
Wish Granting Resources



American Brain Tumor Association

2720 River Road, Suite 146 Des Plaines, Illinois 60018

800.886.2282 TEL info@abta.org EMAIL  
847.827.9918 FAX www.abta.org WEB