CHAPTER 10

Tumors Originating In the Brain – The Astrocytoma (Glioma) Family

In June of 2002, I entered my 13th year as a brain tumor survivor with a Brain Stem Astrocytoma (Glioma). My only explanation of this wonderful gift of time is that I have approached this disease with a “one-two punch,” trying not to fold under at times from sheer exhaustion and this constant fight and always trying to beat it at its own game.

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Key search words
• glioma
• astrocytoma
• glioblastoma multiforme
• oligoastrocytoma
• oligodendrogloma
• anaplastic astrocytoma
• genetic analysis
• brainstem glioma
• ganglioglioma
• radiation
• chemotherapy
• metastasis
• tumor grading

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GENERAL FEATURES OF ALL ASTROCYTOMAS AND GLIOMAS

WHAT’S IN A NAME?

Each year, about 34,000 people are diagnosed with gliomas in the United States. There are few things more confusing to patients and caregivers than the names that are used. They are called astrocytomases (astro-sy-TOE-mahz), or gliomas (glee-OH-mahz). Semantic difficulties are particularly common because one tumor can have several names. Just as a residence could be a log cabin or a brick house, mansion or a hut, a tent in the woods or an inner-city apartment, a glioma can be further named by cell makeup, pathologic grade or location. I suggest that you read Chapter 2, (The Basics), if you have not done so already, before starting this chapter.

TYPICAL SIGNS AND SYMPTOMS OF GLIOMAS

Signs are objective indicators that doctors find during an examination, while symptoms are sensations or feelings that you have that do not seem normal. Signs and symptoms are always related to disruption of normal pathways in a specific location within the brain. For example:

- Tumors in the upper part of the brain (frontal, parietal, temporal lobes) often start with seizures, loss of motor (movement) control or feeling, or headache, depending upon location.
- Tumors in the middle of the brain may cause symptoms of hormone deficiency (thirst/frequent urination, tiredness, hair loss). Those near the optic pathway often cause impairment of eyesight, double vision, blind spots, and, rarely, bulging of the eye.
- Tumors in the brain stem (connection between the brain and spinal cord) start with arm/leg weakness, double vision, facial weakness, clumsiness or wobbliness (ataxia), but rarely headaches or vomiting.
- Tumors in the cerebellum (lower back portion of the brain) trigger headaches, nausea and vomiting (in the morning), difficulty in coordination of hand-eye movements, and unstable walking.
FACTS I NEED TO KNOW ABOUT MY GLIOMA OR ASTROCYTOMA

This section details the most frequently asked questions about gliomas that affect diagnosis and treatment. The topics below also are expanded in the individual sections for each tumor type.

**Table 10-1 Basic Facts About Your Glioma Tumor**

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**Cell Types and Family Names**

Your brain contains about 100 billion nerve cells (neurons) that store memory, detect sensations, and tell your muscles to move. In addition, brain tissue has 10 to 50 times as many supportive and nutritional cells called “glia.” There are two types of glial cells that give rise to tumors:

- **astrocytes** – These cells nourish and protect the neurons. (Tumors of this cell type are called astrocytomas or gliomas); and
- **oligodendrocytes** [o-lee-go-den-dro-sites] – These cells make fatty insulation (myelin) around nerves to prevent short circuits when electrical signals pass through (Tumors of this cell type are called oligiodendrogliomas or “oligos”).

*Mixed gliomas* contain both astrocytes and oligodendrocytes, while a ganglioglioma (gang-glee-o-glee-o-ma) contains nerve cells and glial cells. The frequency of major astrocyte tumor types is illustrated in Figure 10-1.

**Tumor Grade**

Tumor (pathologic) grade refers to how abnormal (more or less cancerous) the cells looks under the microscope.

- **Low-grade gliomas** (grade I and II) look less malignant, closer to normal. These grow slowly and sometimes can be completely removed by surgery. Grade I tumors are sometimes called “benign” because of their appearance under the microscope. But they can still be life threatening, if located deep within vital locations such as the brainstem, or if they convert to a more malignant state. Some refer to this situation as “pathologically benign but malignant by location.”
High-grade gliomas (grade III and IV) contain cells with malignant traits, grow more rapidly and invade nearby tissue. Sometimes roman numerals may be used with a name and tumor grade. For example:

- Juvenile Pilocytic Astrocytoma (JPA)- grade I astrocytoma
- Anaplastic Astrocytomas- grade III astrocytoma
- Glioblastoma Multiforme- grade IV astrocytoma

**Location – Does It Make a Difference?**

Yes it does.

- In the cerebellum the juvenile type “pilocytic” astrocytoma (grade I, low-grade), often found in younger children, usually can be completely removed with an excellent chance for cure. When the same tumor occupies valuable real estate in the hypothalamus, however, or in other parts of the brain, it’s only partly resectable (removable) because it is intertwined with normal brain tissue.