Oligodendroglioma

Oligodendrogliomas come from oligodendrocytes, one of the types of cells that make up the supportive, or glial, tissue of the brain. Oligodendrogliomas are generally soft, grayish-pink tumors. They often contain mineral deposits (called calcifications), areas of hemorrhage, and/or cysts. Under the microscope, these tumor cells appear to have "short arms," or a fried-egg shape. Sometimes oligodendrogliomas are mixed with other cell types. In the United States, almost 18,000 persons are currently diagnosed with oligodendroglioma.[1]

Molecular Classification:

Oligodendrogliomas are a type of glioma that have mutations in one of two genes called *IDH1* and *IDH2* and are missing the two chromosomal arms, 1p and 19q. These tumors are thus named Oligodendroglioma, IDH-mutant, and 1p/19q-codeleted.[2] Oligodendrogliomas are defined as either grade 2 or 3, with grade 3 tumors associated with a more rapid growth. In addition, grade 3 tumors appear to have abnormalities on chromosomes 9 or 10, along with unusual amounts of growth factors and proteins, which are thought to contribute to the more rapid growth of these gliomas.

Location:

Oligodendrogliomas can be found anywhere within the cerebral hemisphere of the brain, although the frontal and temporal lobes are common locations.

Symptoms:

Common signs of an oligodendroglioma are seizures, headaches, and personality changes. Other symptoms may also be noted including persistent weakness or numbness in an arm or leg or changes related to thinking, learning, concentrating, problem-solving, and decision-making. Symptoms may vary by location and size of the tumor.

Treatment:

Surgery: If the tumor is located in a region of the brain that is accessible, then the usual treatment for oligodendroglioma is surgical removal of as much of the tumor tissue as possible. In instances in which the tumor is able to be removed, surgery may be the only treatment needed. Biopsy is typically performed on tumors that are not accessible to confirm the diagnosis and help guide treatment. Recurrent oligodendrogliomas are also generally treated

with surgery, particularly when the time between initial diagnosis and recurrence is extended. In this way, the diagnosis can be updated to reflect any molecular changes that may have occurred over time, whether they be naturally occurring or associated with any treatments including radiation, chemotherapy, or immunotherapy.

Radiation: If some of the tumor remains (also called "residual" tumor) or if the tumor has molecular characteristics that suggest it may be more likely to recur, radiation treatment may be recommended following surgery. Radiation therapy generally takes place over the course of a six week time period and may be given along with chemotherapy.

Chemotherapy: Depending upon the amount of tumor that is not able to be removed (residual tumor) and the molecular characteristics of the tumor itself, chemotherapy may be suggested to treat the remaining tumor. There are several types of chemotherapy that may be used as well as several ways in which the treatment may be received, i.e. via a pill or an intravenous injection.

Treatments for a recurrent oligodendroglioma may include additional surgery, radiation therapy (depending on whether or how much radiation was given after the original diagnosis), chemotherapy/immunotherapy, and clinical trials.[6]

Follow-up:

Regular MRI scans are recommended following the diagnosis of oligodendroglioma, generally at least once per year. Patients with seizures will need to be followed for their seizure medication.

Age Distribution:

Oligodendrogliomas are most common in adults and most often occur between the ages of 20-40. Although these tumors are found in both men and women, they tend to occur more often in men. Oligodendrogliomas are very rare in children under the age of 15.

Prognosis:

Prognosis means a prediction of outcome. This information is usually based on information gathered from groups of people with the same disease. It is important to remember these statistics are not individualized.

The 5-year relative survival rates for oligodendroglioma by age group are as follows:[5]

- Children (0-14): 94.0%

- Adolescents and Young Adults (15-39): 92.2%
- Adults (40+): 76.8%

Risk Factors:

Although all tumors (including oligodendroglioma) are caused by genetic changes,[3] the exact cause of most oligodendrogliomas is not known. Exposure to radiation and certain gene changes that can be passed down through families have been linked to a higher chance of developing oligodendrogliomas.[1,4]

Sources:

ABTA brochure

CBTRUS

UpToDate

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