Low-Grade Glioma Brain Tumours

Introduction

This page contains information about low-grade brain tumours. It has been written as an addition to the information on the Living with a Brain Tumour page. This information will provide a basis for your discussions with your doctors and nurses.

What is a Glioma?

*The brain substance is made up of nerve cells **(Neurons)** and supportive tissue **(Glia)***

Supportive tissue comprises of 3 cell types:

- **Astrocytes**, which are thought to provide the brain's framework and help control the chemistry of brain cells.
- **Oligodendrocytes**, which help as insulators in the transmission of messages in the brain.
- **ependymal cells**, which line the cavities in the brain.

Most primary brain tumours arise from the supportive tissue and are collectively called Gliomas.

Gliomas can be separated further depending on their cell of origin:

- Astrocyte - **astrocytoma**.
- Oligodendrocyte - **oligodendroglioma**.
- Ependymal lining cell - **ependymoma**.

The World Health Organisation grades astrocytomas into four grades. Grade 1 tumours are the least malignant and grade 4 the most malignant.

- **Pilocytic Astrocytoma** is graded as 1
- **Astrocytoma** and **Oligodendroglioma** are grade 2 tumours.

Together these grades are called Low Grade Gliomas.

What are the common symptoms?

The symptoms will vary depending on the size and location of the tumour. Everyone is an individual and the symptoms may be different in different people. Some people may experience all, some or none of the symptoms.

A brain tumour that is slow growing, like **Low Grade Gliomas**, may be present for many years without symptoms. The first symptoms are usually seizures or headaches. 80-90% of people with Low Grade Gliomas of the cerebral hemispheres have seizures. Headaches, seizures and other symptoms such as numbness, weakness or speech problems can occur.

The information in Living with a Brain Tumour and Brain Tumours and Epilepsy pages will explain these points further.

How is the diagnosis made?

Investigation of a suspected brain tumour follows a standardised procedure. A good neurological examination is essential, followed by some combination of the following tests, depending on the need and availability.

- CT Brain scan (Computed Tomography) is a specialised x-ray. It will take 20-30 minutes and an injection, into the back of your hand, of a contrast agent (dye) may be necessary to give the clearest picture of the tumour.
- MRI Brain scan (Magnetic Resonance Imaging) is a specialised imaging technique that gives very clear pictures of the brain and will show the site and extent of the tumour. It usually takes 30-40 minutes and uses magnetism instead of x-rays. People with pacemakers cannot have this test and those with any other metallic implant should inform the doctor well before the test.
- EEG (Electroencephalogram) is a test that measures the electrical activity coming from the brain. It does not give pictures but instead tells a little about how the brain is functioning and it is useful in confirming seizures if there is a clinical suspicion of epilepsy.

How common are these tumours and who gets them?

There are about 8 new cases of primary brain tumour diagnosed for every 100,000 people every year. In other words about 4,500 new cases in the UK each year.

About 20% of primary brain tumours are **Low Grade Gliomas**. The cause remains unknown. Research has not proved a hereditary cause. There do not appear to be any links with occupation, infections or head injury.

Pilocytic astrocytoma mostly occurs in children in the cerebellum or brain stem, but a third occur in the cerebral hemispheres.

Astrocytomas account for **1O%** of adult primary brain tumours and most are situated in the frontal lobe.

Oligodendroglioma account for **5%** of gliomas. They often contain both oligodendrocytes and astrocytes and are therefore referred to as 'mixed glioma'. They occur most frequently in middle aged or young adults, but in rare cases also occur in children and the elderly.

Ependymoma occur most frequently in children in the brain stem and occasionally in the ventricles (fluid filled sacs in the brain).

The information in the Living with a Brain Tumour page illustrates the areas of the brain and its functions.

What treatment might be available?

Your doctor will plan your treatment taking into consideration your general health, your symptoms and signs and the size and position of the tumour. In other words the treatment is planned for each individual.

Surgery

The first treatment choice for accessible tumours is surgery. Accessible tumours are those that can be operated on without a high risk of causing severe neurological damage. **Low Grade Gliomas** may occur in sites that are not easily reached by surgery. In these instances, biopsy alone - examination of a small sample of the tumour - may be performed. Biopsy results help establish the pathological diagnosis and indicate whether the tumour is amenable to other treatments. Tumours that are located in the areas of the brain that control breathing, intellect or physical movement would possibly be considered inoperable.

Radiotherapy is the use of high energy x-rays to destroy tumour cells. It may be given after surgery, depending on tumour location, its size and the signs and symptoms produced. For further information see the Radiotherapy for Brain Tumours page.

Chemotherapy is treatment with drugs which destroy tumour cells. It is usually not necessary for this type of tumour. For further information consult your doctor or the Chemotherapy for Brain Tumours page.