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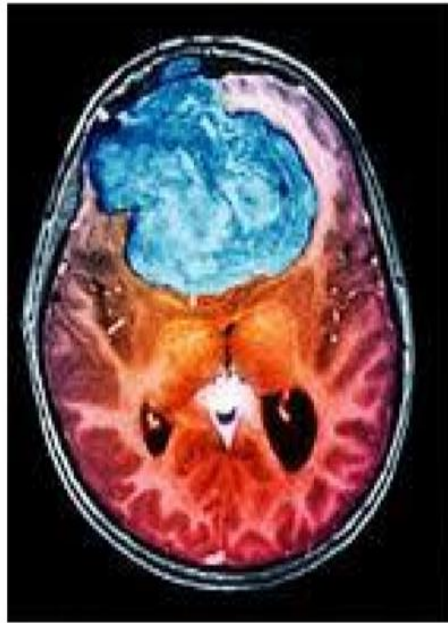
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BRAIN TUMOURS

A Guide for Patients and their Families



Brain Tumors

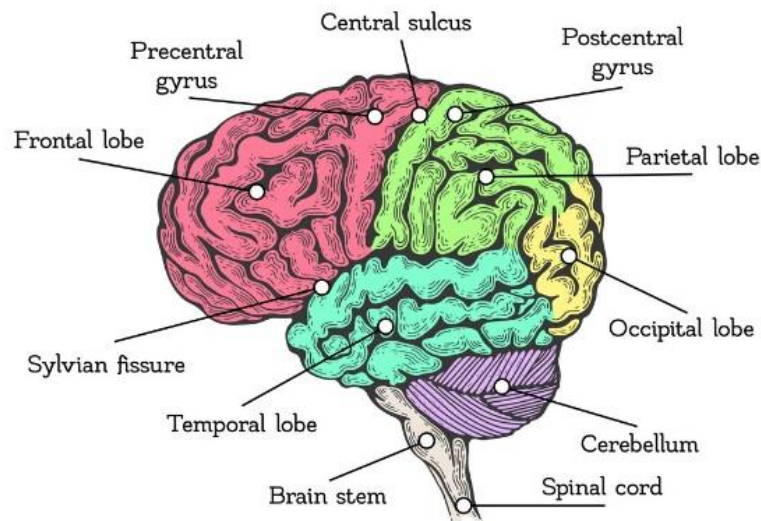
What Are Brain Tumors?

A brain tumour is an abnormal growth, of cells inside the skull.

Primary brain tumors are tumors which arise from the brain. They can grow from the cells of the brain, blood vessels in the brain, nerves that emerge from the brain or the membranes covering the brain. Benign (non cancerous) brain tumors are generally slow-growing tumors They can exert potentially damaging pressure on the brain but they do not spread into the surrounding brain tissue. Malignant (cancerous) brain tumors are rapid growing and they spread into the surrounding brain. Secondary or metastatic brain tumors grow from cancer cells that originate from a primary cancer located in another organ (e.g. lung, breast or colon).

Both primary and secondary brain tumors can result in severe disability and can cause death if the growth is left unchecked. All patients with symptoms of a possible brain tumour should be evaluated by a neurosurgeon for diagnosis and treatment.

Anatomy of the brain



Causes of Brain Tumors

A few genetically inherited diseases have been identified that can increase the risk of the development of brain tumors. For example, in the inherited condition known as Von Hippel Lindau Syndrome, children, siblings and relatives can develop tumors in the cerebellum and other parts of the body such as malignant

kidney tumors Research has shown identifiable genetic abnormalities in some brain tumors. Some tumors are also known to have an increased incidence in certain families.

However, in the vast majority of cases, the cause of brain tumors is unknown. There is at present, no clear evidence that injury, chemical exposure, viral infection, mobile phone use, environmental factors or mental stress can cause the growth of brain tumors.

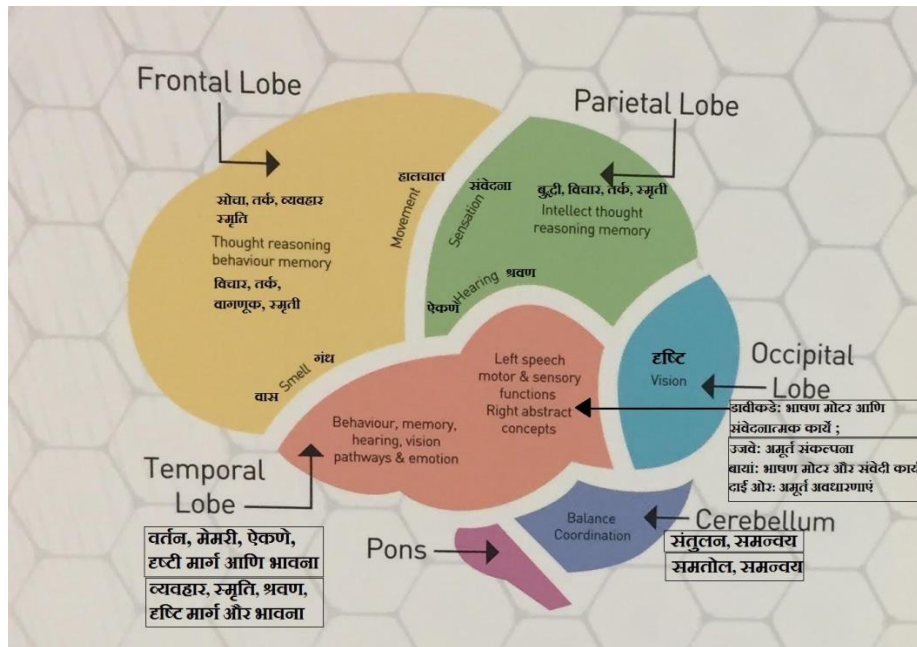
Symptoms of Brain Tumors

The symptoms may be generalised or localised.

Generalised symptoms are due to increased pressure exerted on the brain and include:

- A recurring headache that is worse in the morning
- Nausea and vomiting
- Seizures
- Increased drowsiness

Localised symptoms depend on the location of the tumour and include:



Progressive weakness or numbness in the arms or legs

- Progressive difficulty with speech, hearing and visual deficit
- Memory loss or a change in memory
- A significant change in personality or behaviour

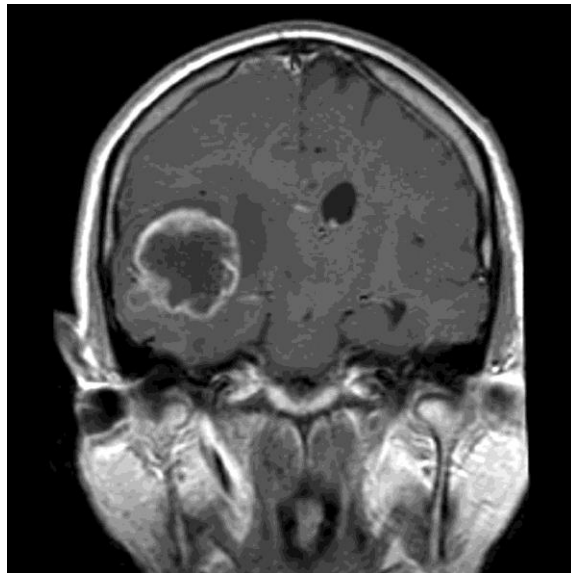
Some of these symptoms may also be caused by other conditions besides brain tumors. It is therefore wise to seek a neurosurgical opinion should the symptoms persist.

Risk of Developing Brain Tumors

Brain tumors may occur at any age, but the tumors that occur in childhood are generally different from those diagnosed in adults.

How are Brain Tumors Diagnosed?

A detailed clinical assessment including history of the symptoms and a physical examination, including a comprehensive neurological examination, is necessary. Specialised imaging tests such as Computed Tomography (CT scan), Magnetic Resonance Imaging (MRI) will usually be performed. Occasional, special tests like cerebral angiogram (X-rays of the blood vessels of the brain), functional MRI scans and MRI tractography may be required. These tests will reveal the tumour's size, location and also proximity to critical structures such as the speech or motor areas of the brain. The information will provide the neurosurgeon with a tentative diagnosis of the type of tumour and to aid him to plan the surgical approach for its removal.



Brain scans like MRI are usually done to detect tumors location and size



SONOPET CUSA



KINEVO MICROSCOPE

Treatment of Brain Tumors

Surgery

In most cases, surgery using microsurgical techniques is required to remove as much tumour with minimal injury to the brain. Brain tissue is extremely delicate and can sustain permanent damage from excessive pressure or disruption of its blood supply. The risks of surgery include infection, bleeding, seizures, paralysis, coma and even death

Sophisticated equipment is available to make surgery safe and effective. Use of a computerised navigation system allows the neurosurgeon to localise the tumour accurately so as to navigate around critical areas of the brain.

The Operating Microscope facilitates the presentation of important nerves and blood vessels, thereby reducing the risk of injury. Ultrasonic aspirators are also available to facilitate tumour resection. A brain tumour can be treated through a small opening made in the skull using CT or MRI-guided stereotactic surgery. If the boundaries of the tumour cannot be easily identified the neurosurgeon may have to stop the tumour resection to minimize the risk of damaging normal brain.

Treatment of Brain Tumors (continued)

Under special circumstance when the tumour is located in critical areas of the brain, usually speech or motor areas, the surgery may even be done with the patient under sedation but awake. The critical areas can be identified more clearly by stimulating the areas with a small electrical current and tumour removal is performed with constant monitoring of the patient's speech or limb strength. The overall aim is remove as much tumour as possible with least damage to the critical areas.

When the brain tumour is small and deep-seated more extensive tumour removal may not be possible. In situations, a stereotactic frame may be fixed and CT or MRI guided performed. A small piece of tumour is taken and sent for diagnostic investigations.



Stereotactic biopsy

Radiation Therapy

For primary cancerous brain tumors that cannot be completely removed, surgery may be followed by external beam radiation delivered by a linear accelerator over 2-6 weeks to destroy the remaining tumour cells.

Chemotherapy

Drugs that destroy or slow down the growth of tumour cells can be administered either orally or by intravenous injection. Hair loss, nausea and susceptibility to infection are potential side effects of chemotherapy.

Radiation Treatment

Brain metastases and benign brain tumour that cannot be removed surgically or are present in patients unfit for surgery can be treated by stereotactic radiation. This delivers narrow beams of strong radiation aimed precisely at the tumour from many different directions. Normal brain tissue therefore receives only a fraction of the total radiation dose received by the tumour. Exact knowledge of the tumour location is necessary, and this achieved by securing the head firmly but painless in a custom-made mask system and doing a CT scan of the head is also required.

Rehabilitation

Recovery may at times be limited by the extent of damage caused by the tumour and by the brain's ability to recover. Therapists are available to commence physiotherapy, occupational therapy and speech therapy in the Department of Rehabilitation Medicine or to a nursing care facility for a further period of rehabilitation to maximize the recovery process. To fully benefit from rehabilitation, the patient and family should maintain a positive attitude, set realistic goals and work steadily to accomplish each goal.