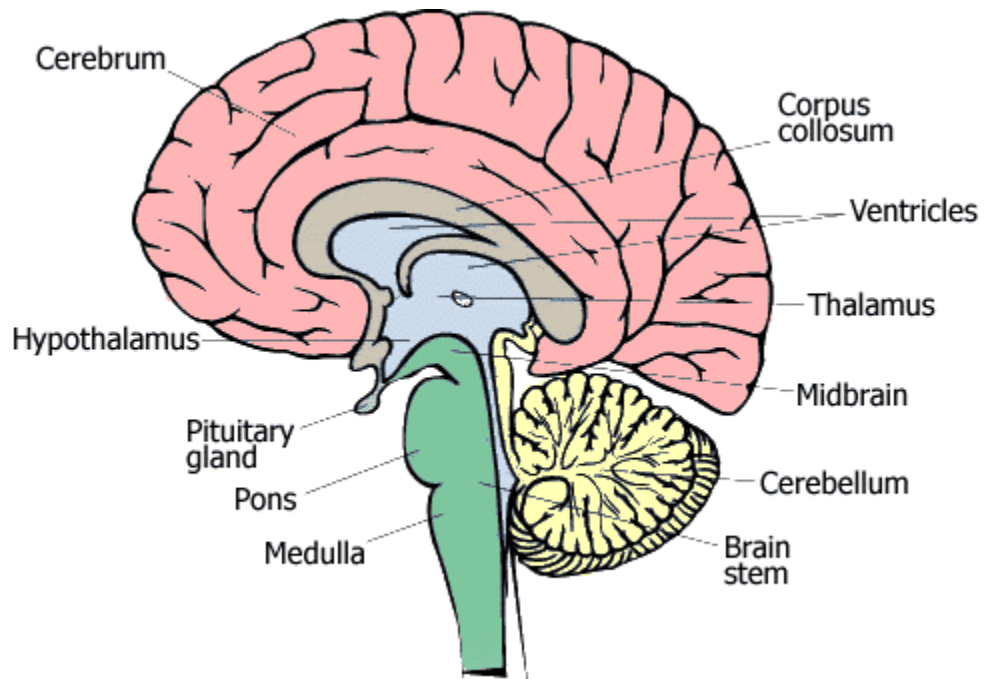


Radiation Medicine Department

Brain Tumors: Overview

Overview

The brain is a soft, spongy mass of tissue protected by the bones of the skull and three thin membranes called meninges. Watery fluid called cerebrospinal fluid cushions the brain. This fluid flows through spaces between the meninges and through spaces within the brain called ventricles.



A network of nerves carries messages back and forth between the brain and the rest of the body. Some nerves go directly from the brain to the eyes, ears, and other parts of the head. Other nerves run through the spinal cord to connect the brain with the other parts of the body. Within the brain and spinal cord, glial cells surround nerve cells and hold them in place.

The brain directs the things we choose to do, the things our body does without thinking, and our sense, memory, emotions, and personality.

Parts of the Brain

The three major parts of the brain control different activities:

- **Cerebrum** - The cerebrum is the largest part of the brain. It is at the top of the brain. It uses information from our senses to tell us what is going on around us and tells our body how to respond. It controls reading, thinking, learning, speech, and emotions. The right hemisphere controls the muscles on the left side of the body. The left hemisphere controls the muscles on the right side of the body.
- **Cerebellum** - The cerebellum is under the cerebrum at the back of the brain. The cerebellum controls balance and complex actions like walking and talking.
- **Brain stem** - The brain stem connects the brain with the spinal cord. It controls hunger and thirst. It also controls breathing, body temperature, blood pressure, and other basic body functions.

Brain Tumors

Brain tumors can be benign or malignant:

Benign brain tumors do not contain cancer cells:

- They can usually be removed and they seldom grow back.
- Cells from benign tumors do not invade tissues around them or spread to other parts of the body. However, benign tumors can press on sensitive areas of the brain and cause serious health problems.
- Unlike benign tumors in most other parts of the body, benign brain tumors are sometimes life threatening.
- Very rarely, a benign brain tumor may become malignant.

Malignant brain tumors contain cancer cells:

- Malignant brain tumors are generally more serious and can be often life threatening.
- They may grow rapidly and crowd or invade the surrounding healthy brain tissue.
- Very rarely, cancer cells may break away from a malignant brain tumor and spread to other parts of the brain, or to the spinal cord.

Secondary Brain Tumors

- Cancer that spreads to the brain from another part of the body is different from a primary brain tumor.
- When cancer cells spread to the brain from another organ (such as the lung or breast), doctors may call the tumor in the brain a secondary tumor or metastatic tumor.
- Secondary tumors in the brain are far more common than primary brain tumors.

Symptoms	<p>The symptoms of brain tumors depend on tumor size, type, and location. Symptoms may be caused when a tumor presses on a nerve, when the brain swells, or when fluid builds up within the skull.</p> <p>These are the most common symptoms of brain tumors:</p> <ul style="list-style-type: none"> • Headaches (usually worse in the morning) • Nausea or vomiting • Changes in speech, vision, or hearing • Problems balancing or walking • Changes in mood, personality, or ability to concentrate • Problems with memory • Muscle jerking or twitching (seizures or convulsions) • Numbness or tingling in the arms or legs
Diagnosis	<p>If a person has symptoms that suggest a brain tumor, the doctor may perform one or more of the following procedures:</p> <ul style="list-style-type: none"> • Neurologic exam - The doctor checks for alertness, muscle strength, coordination, reflexes, and response to pain. The doctor also examines the eyes to look for swelling caused by a tumor. • CT Scan – An x-ray machine linked to a computer takes a series of detailed pictures of the head. • MRI - A powerful magnet linked to a computer makes detailed pictures of areas inside the body. • Angiogram - Dye injected into the bloodstream flows into the blood vessels in the brain to make them show up on an x-ray. • Spinal tap - The doctor may remove a sample of cerebrospinal fluid (the fluid that fills the spaces in and around the brain and spinal cord). • Biopsy - The removal of tissue to look for tumor cells is called a biopsy.
Grading	<p>Doctors sometimes group brain tumors by grade—from low grade (grade I) to high grade (grade IV). The grade of a tumor refers to the way the cells look under a microscope. Cells from high-grade tumors look more abnormal and generally grow faster than cells from low-grade tumors.</p>