Brain and Spinal Cord Tumors

Brain and spinal cord tumors are abnormal growths of tissue. They are found inside the skull or backbone (*spinal column*). These are the primary parts of the central nervous system (CNS). **Malignant tumors are cancerous. Benign tumors are not.** The CNS is housed within rigid, bony spaces (*skull* and *spinal column*). Any abnormal growth can place pressure on sensitive tissues. This could impair function. Tumors that begin in the brain or spinal cord are called primary tumors.

CAUSES

- Most primary tumors are caused by out-of-control growth. This occurs among cells that surround and support neurons (*nerve cells that send messages through your body*).
- Primary tumors may result from specific genetic disease (neurofibromatosis, tuberous sclerosis). They may also result from exposure to radiation or cancer-causing chemicals.
- The cause of most primary tumors is not known.
- Primary tumors are not contagious (*cannot be caught from another person*). At this time, they are not preventable.

SYMPTOMS

Symptoms of **brain tumors** include:

- Headaches.
- Convulsions (*seizures*).
- Feeling sick to your stomach (*nausea*).
- Vomiting.
- Thinking (*cognitive*) problems.
- Hearing and/or visual impairment.
- Behavior problems.
- Difficulty with movement (*motor skills*).
- Problems with balance.

Symptoms of **spinal cord tumors** include:

- Pain.
- Changes in the way you feel things (*sensory changes*).
- Difficulty with movement (*motor skills*).

DIAGNOSIS

- The first test to diagnose brain and spinal cord tumors is a neurological exam (*nervous system function test*).
- Special imaging techniques may also be used, such as:
  - CT scan (*computed tomography*).
  - MRI (*magnetic resonance imaging*).
  - PET scan (*positron emission tomography*).
- Laboratory tests may be done, including EEG (*electroencephalogram*) and spinal tap (*taking a sample of spinal fluid*).
- Caregivers may take a tissue sample (*biopsy*). This is a surgical procedure. A sample of tissue is taken from a suspected tumor, to help make a diagnosis.

TREATMENT

The 3 most commonly used treatments are:

- Surgery.
- Radiation.
- Chemotherapy.

Caregivers may also prescribe steroids, to reduce swelling inside the CNS.

PROGNOSIS

Symptoms of brain and spinal cord tumors generally develop slowly. They get worse over time, unless they are treated. The tumor may be classified as benign or malignant. It may be given a numbered score to show how quickly it will progress. This score can help caregivers determine how to treat the tumor and to predict the likely outcome for the patient.

RESEARCH BEING DONE

- Researchers are studying:
  - Small, radioactive pellets implanted directly into the tumor (*brachytherapy*).
  - Advanced drugs and techniques for chemotherapy and radiation therapy.
- In gene therapy, for brain and spinal cord tumors, scientists insert a gene to:
  - Make the tumor cells sensitive to certain drugs.
  - Program the cells to self-destruct.
  - Instruct the cells to produce substances to slow their growth.
- Scientists are also investigating why some genes become cancer-causing.
- Tumors are more sensitive to heat than normal tissue. Research scientists are testing elevated body temperature (*hyperthermia*) as a treatment. They place special heat-producing antennae into the tumor region, after surgery.
- With immunotherapy, scientists are looking for ways to duplicate or enhance the body's immune response to fight against brain and spinal cord cancer.

Research is continually being done to learn more about this problem.

Information provided by the National Institute of Neurological Disorders and Stroke.

Document Released: 09/09/2003 Document Re-Released: 01/09/2011
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