******

Hossein Elgafy, MD, FRCSEd, FRCSC, MBA Professor of Orthopedics Chief of Spine

A spinal tumor, also called a neoplasm (new abnormal growth), is a growth that develops within the spinal canal or within the bones of the spine. A spinal cord tumor, also called an intradural tumor, is a spinal tumor that begins within the spinal cord or the covering of the spinal cord (dura). A tumor that affects the bones of the spine is called a vertebral tumor.

A black and white photo of a person

Description automatically generated A person wearing a suit and tie

Description automatically generated

MRI of the spine showing a spinal cord tumor CT showing a tumor of the vertebra of the spine

Tumors in the spine are either malignant or benign. A spinal tumor’s cells progress at different rates, some cells may multiply slowly or rapidly depending on the type of tumor. The tumor can be primary or secondary. A primary tumor originates from the spinal cord, spinal nerves, or surrounding bone. A secondary tumor (metastasis) originates in another part of the body and then spreads to the spine. The majority of spinal tumors are secondary tumors originally developed in another part of the body, such as the breast, prostate, lung, kidney or thyroid gland.

### Symptoms: Spinal tumors can cause different symptoms, especially as tumors grow.

* Pain that is not related to physical activity
* Pain in the back or neck that comes on suddenly and then gets worse, especially at night, can be a hallmark of a spinal tumor
* Pain may radiate to the arms and hands, or legs and feet, and persist even when at rest
* Muscle weakness or loss of sensation, especially in the legs and arms
* Difficulty walking
* Loss of bladder or bowel control
* Abnormal curvature of the spine not caused by poor posture

### Red Flags: There are many causes of back pain, and most back pain isn't caused by a tumor. However, there are some red flags that may indicate that back or neck pain is not just muscle strain or a degenerative disc. One has to seek medical advice to rule out other causes of pain such as tumors. These red flags are:

* Persistent pain that is rapidly getting worse and not activity related
* History of cancer, even if it was many years ago
* Associated symptoms such as nausea, vomiting or dizziness

### ****Diagnosis:** Tumors are typically diagnosed through speaking with the patient and performing multiple studies to assess the nature, location and stage (spread) such as:**

* Clinical history and examination
* Image studies of the spine such CT scan, MRI, PET scan (positron emission tomography)
* CT guided biopsy: If the imaging studies are suspicious for a tumor, a CT guided biopsy may be performed. The procedure is usually done under local anesthesia under CT to locate the tumor and make sure that the tissue of the biopsy is taken from the tumor cell. A small sample of tissue will be examined to see if the tumor is benign or malignant. If malignant, the biopsy will determine the type of cancer that is present, as well as determine (along with other studies) the stage of the disease
* Other tests may be required such as blood tests and imaging studies of other part of the body depending on the type of tumor

### ****Treatment:** The decision to administertreatment** depends on many factors, including whether the tumor is benign or malignant, tumor size and location, and symptoms. Treatment includes:

* **Monitoring (watch and wait)**: Small, benign tumors that aren’t growing or impinging on other structures may only need to be watched for changes through the use of MRI or CT scan studies
* **Radiation therapy**
* **Stereotactic radiosurgery**, which delivers a high dose of radiation specifically targeted to the tumor
* **Chemotherapy**
* **Surgery to remove the tumor**

**Decision Factors** on which methods are chosen to treat the tumor include:

* Tumor type, as some tumors are very radiosensitive and can be managed with radiation only. Other tumors do not respond to radiation and surgical management may be needed.
* Age, as ability to walk and survival are both prolonged in patients treated with surgery compared to patients treated with radiation alone in patients younger than 65 years old
* Medical co-morbidities
* Presenting symptoms such as progressive weakness
* Type of pain: Mechanical pain that comes with mobility and is related to spine instability versus biological (constant) pain that is related to the tumor growing. Mechanical pain may require surgical management to stabilize an unstable spine.
* Imaging studies assessing the degree of spinal cord compression and spine instability

## **Complications:** Spinal tumors can compress spinal nerves, leading to a loss of movement or sensation below the location of the tumor. This can sometimes cause changes in bowel and bladder function. Nerve damage may be permanent. However, if caught early and treated aggressively, it may be possible to prevent further loss of function and regain nerve function. Depending on its location, a tumor that presses against the spinal cord itself may be life-threatening.