

Tumors Involving the Cervical Spine

Introduction

The most common early symptom in patients with tumors of the cervical spine is neck pain. The pain may begin gradually and become more pronounced over an extended period of time. Patients may also experience shoulder, arm, or leg pain as the tumor mass extends beyond the confines of the bone or spinal canal to involve the spinal cord or nerve roots. As the tumor continues to grow, numbness, tingling, or a "funny" feeling in the arms or legs may be noticed. With further growth, weakness in the arms or legs can develop, as well as a decreased ability to walk normally. There may even be problems with bladder and/or bowel function.

Generally speaking, cervical spine tumors can be divided into two categories: those that begin in the bone (the spine itself), and those that begin within the confines of the spinal canal and involve the spinal cord and nerves. It is often difficult to tell from the patient's history alone where the tumor is arising from, as neck pain is usually the initial complaint in both types of tumor.

Common Cervical Spine Tumors

Tumors of the Bone:

Tumors of the spine itself may be either primary or metastatic. Primary tumors are often benign and generally occur in patients younger than 30 years of age. Primary spinal tumors are rare, accounting for less than 0.1 % of all tumors, and about 10% of all bony tumors. The most common primary tumors of the cervical spine are osteochondromas, osteoid osteomas, giant cell tumors, hemangiomas, and osteblastomas, and tend to be benign. Common malignant primary tumors of the cervical spine include plasmacytoma, osteosarcoma, chordoma, chondrosarcoma, and lymphoma.

Metastatic tumors of the spine are much more common than primary tumors. They grow faster and may appear in multiple areas of the spine. Approximately 25-33% of all patients with metastases will have some spinal involvement. The most common cancers that metastasize to the spine include lung, breast, and prostate. Other tumors that can cause spinal metastases include kidney, thyroid, and colon.

Tumors of the Neural Elements:

Tumors within the spinal canal generally occur either in the spinal cord itself, a peripheral nerve, or the covering around the spinal cord. Tumors that arise from the neural elements are also rare, occurring at a rate of about 5 per 100,000 population. Tumors that arise from the spinal cord account for 5% of all spine tumors. The three most common tumors arising from the spinal cord are astrocytomas, ependymomas, and hemangioblastomas. While often histologically benign, they can be difficult to remove because of their location within the spinal canal.

Tumors arising within the spinal canal but not the cord are much more common, and are also often benign. They can usually be completely resected. Meningiomas arise from the covering (dura and arachnoid) of the spinal cord and tend to displace the spinal cord by a mass effect. Nerve sheath tumors, known as schwannomas or neurofibromas, grow along a specific nerve. They tend to be benign, and remain either within the spinal canal or follow the nerve root as it exits the canal.

Evaluation

Your doctor will most likely ask you a series of questions to determine the source of the tumor, and then some diagnostic tests will be performed to get more information. Some standard questions include: (1)

Have you or a member of your family ever had cancer? Some tumors may spread to the cervical spine from primary locations in other parts of the body. (2) How long have you had neck pain? (3) Does it stay in the neck, or radiate ("spread") to your arm, leg, or shoulder? (4) Do you have any weakness, numbness, or other unusual sensation? (5) Is the pain worse at any particular point in the day? In patients with cervical spine tumors, the pain may be worse at night. (6) Is the pain worse with activity?

In addition to obtaining the history, the physician will perform a neurologic exam. The strength in the arms and legs will be tested, as will the reflexes and sensation. Additionally, range of motion of the neck and an evaluation of gait will be performed.

Once your doctor suspects you may have a cervical spine tumor, a series of diagnostic studies will be obtained. Often the first test ordered will be plain x-rays. They are useful for detecting bone destruction and/or fracture of the spine as well as spinal stability. Plain x-rays may also be useful in assessing vertebral foramen size (the area where the nerve root exits the spinal cord), which may be enlarged in certain tumors.

If more bony detail is necessary in assessing the tumor, a CT scan may be the next test ordered. This study provides more bony information than plain x-rays, particularly if there is evidence of bone destruction. To further enhance the details of the CT scan, a CT myelogram test may be obtained. The images provide detail on whether there is spinal cord compression, and if so, the extent and nature of the compression. More sophisticated CT scans provide images in three dimensions, allowing your physician more data in guiding potential treatment.

A magnetic resonance imaging scan (MRI) is also useful in helping diagnose cervical spine tumors. This test provides information regarding bony detail, soft tissues around the spine, and the spinal cord. It can provide evidence of other tumors at different levels of the spine. Sometimes intravenous contrast is given to distinguish neoplastic (cancerous) tissue from non-neoplastic tissue.

Once the history, physical exam, and diagnostic tests are all completed, your physician will discuss the various treatment options with you. These may include further tests, such as a bone scan, arteriogram, or blood work. In most cases, if there is no prior tissue diagnosis and you are medically stable, surgery for biopsy and possible even definitive treatment is often the first treatment option.

Treatment

Medical Treatment:

Some tumors of the spine may be treatable non-surgically. Treatment options include whole-beam radiation, stereotactic radiosurgery, and chemotherapy. Whether the tumor of the spine can be treated with radiation depends on several factors, including the size of tumor and the type of cells the tumor contains. Generally speaking, the smaller the tumor is, the more amenable it is to radiotherapy. If the histology of the tumor is already known (either by biopsy or because of metastases), and the tumor is radiosensitive, radiation therapy may be the only treatment necessary.

Radiation may also be used in combination with surgery, either to shrink the tumor pre-operatively or to treat remaining tumor after surgery. This modality is particularly useful for residual tumor within the spinal cord.

Generally speaking, chemotherapy is reserved for patients with systemic metastases, or as an adjunct to surgical resection of malignant spinal cord tumors.

Surgical Treatment:

The type and extent of the tumor will determine the approach the surgeon recommends. If the tumor is within the spinal canal, either adjacent to or actually in the spinal cord, a posterior approach is generally recommended. This often involves removal of the back part of the spine (known as a laminectomy), with biopsy and resection of as much of the tumor as is safely possible. You will have general anesthesia, be placed prone, and have a scar on the back of your neck. Often your surgeon will give you medicine a few days before surgery to reduce swelling from the tumor. If the tumor involves the bones in the back part of the spine, an additional step known as a fusion may be necessary. This involves using your own or banked bone, as well as spinal instrumentation to stabilize your spine while the fusion takes place.

If the tumor involves the front part of your spine, an approach going through the front part of your neck is performed. In these cases, resection of bone is often required, necessitating the additional step of fusion followed by spinal fixation.

After surgery, other treatments may be necessary, including radiation therapy and/or chemotherapy. Depending on the type of surgery and what type of internal fixation was used, immobilization for some period of time in a neck collar or some other type of orthosis may be necessary.

Having a cervical spine tumor can be frightening. There are often unknowns about the kind of tumor it is, what type of surgery is required, and whether it can be cured. Careful consultation with your surgeon regarding his or her experience in performing this type of surgery, as well as a discussion of all the relevant treatment options, offers the best chance for surgical success.

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