



fight against childhood epilepsy & seizures

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Brain Tumors and Epilepsy

by Steven Pacia, MD

Brain tumors are classified as primary or metastatic. Primary brain tumors arise from cells within the brain whereas metastatic tumors are the result of tumor cells that have migrated from other parts of the body (i.e., lung, breast, skin). The incidence of primary brain tumors is approximately 1 in 10,000 people. While no tumor in a vital structure like the brain should be considered "benign", some tumors are more aggressive or grow more rapidly than others. Lower grade tumors may be cured by surgery or a combination of surgery and radiation therapy. Higher grade tumors are less commonly cured although advances in radiation treatments and chemotherapy have led to great improvements in quality of life and length of survival for patients with some tumors. Improvements in MRI permit the detection of smaller tumors leading to earlier treatment and better outcomes for many patients.

Brain tumors are discovered in several ways. Some patients with larger tumors complain of persistent headache particularly while lying flat or coughing while others suffer symptoms from dysfunction in the brain area where the tumor has invaded or displaced normal tissue. Common presentations include weakness or numbness on one side of the body, language disturbance, or vision deficits. A seizure may also be the first indication of a brain tumor. Seizures are the most common initial presenting symptom for low grade tumors like astrocytomas (most common type of intrinsic brain tumor) and from tumors located in brain regions where dysfunction does not always result in obvious clinical manifestations (frontal and temporal lobe of the non-language hemisphere, small tumors of the language dominant anterior frontal region).

Seizure control is especially important in patients with brain tumors. In addition to the risks and negative effects that seizures produce in everyone, seizures may infrequently cause prolonged neurologic deficits due to the increased metabolic demand on already compromised brain tissue adjacent to a tumor. Physicians who treat brain tumor related seizures must also be aware of other unique issues. Many patients receive chemotherapy agents which may cause drowsiness, reduce white and red blood cell counts, and interact with antiepileptic medications. As a result, treatment must be tailored to the patients anti-tumor therapy. For instance, medications like phenytoin may increase the breakdown of certain chemotherapy agents (or steroids), thereby reducing the amount of chemotherapeutic agent available to treat the tumor.

Seizures resulting from brain tumors can often be reduced or eliminated by surgery. However, it is not the tumor that causes the seizures but the injured brain cells

next to the tumor. At NYU medical center we have elected to combine brain tumor resective surgery with epilepsy surgical techniques to improve post-operative seizure control. For appropriately selected patients we record the EEG from the brain surface to identify epilepsy producing regions prior to removal of the tumor. If the electrically irritable brain region next to the tumor is non-functional and safe to remove, we will opt to remove it. We believe that this results in better postoperative seizure control although formal studies verifying this are difficult have not been carried out.

Ultimately, close communication between the patient, neurologist, neurosurgeon, radiation oncologist and neuro-oncology team is vital to ensure seizure control, to minimize side effects, to maximize benefit of anti-tumor therapies, and to provide the best quality of life possible for patients battling this difficult disorder.