Awake Craniotomy Procedure, Performed by Dr. Ramin Rak, Makes it Possible to Operate on Previously Inoperable Brain Tumors

Awake craniotomy – a procedure in which the patient remains awake during brain tumor surgery in order to determine if the operation will touch on any areas that affect such abilities as speech, movement and vision – can now be done on many patients whose tumors were previously thought inoperable, or for whom surgery would have been very risky, due to the tumors’ location. This good news is due to new neuronavigation, neurosurgical, microneurosurgical and functional brain imaging (functional MRI) technologies, as well as newer anesthesias, which make the procedure more precise, safe and easier to conduct than it was just a few years ago.

Rockville Centre, New York (PRWEB) February 20, 2013 -- Awake craniotomy – a procedure in which the patient remains awake during brain tumor surgery in order to determine if the operation will touch on any areas that affect such abilities as speech, movement and vision – can now be done on many patients whose tumors were previously thought inoperable, or for whom surgery would have been very risky, due to the tumors’ location. This good news is due to new neuronavigation, neurosurgical, microneurosurgical and functional brain imaging (functional MRI) technologies, as well as newer anesthesias, which make the procedure more precise, safe and easier to conduct than it was just a few years ago. Awake craniotomy can also be used in some epilepsy surgeries.

“The more we perform awake craniotomies, the more we find a mismatch between function and anatomy,” said Ramin Rak, M.D., F.A.A.N.S., F.A.C.S. “This illustrates the necessity for performing this procedure in these types of cases, using these technologies to plan the procedure and guide us.”

Dr. Rak, who is one of the leading neurosurgeons in New York performing this procedure and the most experienced neurosurgeon performing awake craniotomies on Long Island, with the most comprehensive approach and team, says these and other advances have now made it possible to perform these procedures in technologically advanced local hospitals, not just in a few large urban academic medical centers around the U.S. Dr. Rak, an attending neurosurgeon with the Neurological Surgery, P.C. private practice, performs awake craniotomies at NS-LIJ Huntington Hospital, where he serves as Director of the Brain Tumor Program and has been performing awake craniotomies since 2010 in the hospital’s state-of-the-art operating room.

Among the unique aspects of Dr. Rak’s approach is that he maps out not just the brain’s gray matter, but the nerve fibers of its white matter as well. This means that a larger area of the brain is tested – and protected – during the awake craniotomy.

“We now have a way to successfully perform surgery on patients whose tumors are in the dominant hemisphere or an eloquent part of their brain, with a low risk of damage to their linguistic, motor or sensory capabilities such as vision,” says Dr. Rak. “Many of these patients’ tumors would have previously been considered inoperable, and these patients would have had a worse prognosis without this surgery.”

Although most brain tumor surgery is performed while the patient is under general anesthesia, awake craniotomy, performed without general anesthesia, avoids touching on eloquent areas of the brain by keeping the patient awake and having him or her demonstrate abilities such as speech, movement and vision during the
surgery, but before the tumor is removed. Patients feel no pain, despite their awake state. This is because the brain, when touched directly, does not feel pain, and because local and regional anesthesia are used on the surrounding tissues such as the scalp.

With one of the most comprehensive approaches and awake craniotomy teams in greater New York, Dr. Rak works closely with Neurological Surgery, P.C. neuropsychologist Gad Klein, Ph.D. before, during and after the surgery, to map out and avoid the potentially affected areas of the brain, and works closely with an anesthesiologist, who carefully adjusts anesthesia levels throughout the procedure’s multiple phases. A specialized team that also includes a neurophysiologist (who monitors the brain’s electrical impulses), physician’s assistants and nurses ensures that everything runs like clockwork.

Once a patient is identified as a good candidate for awake craniotomy, Dr. Klein works with him or her to both establish a baseline of cognitive function and precisely pinpoint the tumor’s location. Dr. Klein then administers neuropsychological tests that determine the patient’s baseline language function to ensure the patient is able to do the intra-operative testing and to compare the patient’s intra-operative function to their baseline function. This is important as the patient will need to speak throughout the procedure, as well as to follow Dr. Klein’s instructions.

A functional MRI (fMRI) scan is done before the surgery to begin identifying functional areas of the brain that are impacted by the tumor. fMRI, which measures blood oxygen flow in the brain that correlates with brain activity, is used to see how and where the patient’s brain reacts when the patient completes certain tasks. The fMRI, standard MRI and neuronavigation MRI are combined to create a complete picture of brain anatomy and function and their relationship to tumor structure, and programmed into a sophisticated computerized neuronavigation system.

In the OR, guided by neuronavigation, fMRI and other imaging modalities, Dr. Rak first opens the patient’s skull while he or she is under mild intravenous sedation. The patient is then gently awakened. Dr. Rak uses fMRI and intra-operative electrophysiology to map the brain’s white and gray matter. While Dr. Rak applies small amounts of electricity to the brain, Dr. Klein leads the patient through a series of cognitive tests. He may show the patient a picture and ask to describe it, or repeat a word or sentence. Dr. Klein also tests other sensory and motor activities.

Dr. Rak maps the brain throughout this testing, marking areas that should be avoided during surgery. The patient is then put back under sedation, and Dr. Rak begins the tumor removal; the patient may also be awakened and sedated during the tumor resection itself, to continue testing in order to avoid eloquent areas. Dr. Rak likes to keep the procedure at three hours or less, to avoid potential complications.

Dr. Rak is specially trained in microneurosurgery and uses microneurosurgical techniques for most awake craniotomies. He is able to remove more of the tumor and less healthy tissue, with greater accuracy and less recovery time with this delicate and technologically advanced technique, which uses high powered microscopes to guide surgery. Patients can usually go home within two days.

“Awake craniotomy patients also recover much faster than those put under general anesthesia,” said Dr. Rak. “More and more patients are candidates for this procedure, and can experience these benefits.”

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