

Giving Brain Tumors Nowhere to Hide

Space-age technology gives neurosurgeon unparalleled accuracy and control

Recently Dominican Hospital neurosurgeons began viewing their cases with a sharper eye. Thanks to the hospital's recent acquisition of leading-edge equipment, neurosurgeons are able to pinpoint brain and spinal tumors with greater precision and remove them more safely and completely.

Called frameless stereotactically guided brain surgery, the new approach incorporates a new, highly sophisticated operating microscope and 3-D computer imaging technology pioneered by Carl Zeiss, Germany, with a "heads-up" display used by the military.

Here's how the new \$800,000 Zeiss system works: Adhesive markers placed on the patient's head become reference points among the many images gathered by Magnetic Resonance Imaging (MRI) and Computerized Tomography (CT) studies and are digested by the computer. Once the tumor has been located, the computer locks it in and transfers the coordinates to the operating microscope. The surgeons are able to visualize the patient's head and brain in three dimensions, so they can rotate the image on the computer's screen in order to determine the safest pathway to the tumor. They then outline precisely on the patient's skin the size and shape of the tumor. This helps them make the smallest possible incision in the skin and skull.

"We are enormously pleased with this equipment," says Dominican Neurosurgeon Gail Magid, MD, who researched many new systems along with Neurosurgeons Rosemaria Gennuso, MD, and Charles Scibetta, MD. "We are delighted with its accuracy and sensitivity." Dr. Magid points out that the new equipment enables surgical preplanning with precision within one millimeter – a distance that could mean the difference between a hand working or being disabled.

He explains that the system in place at the Dominican Surgery Department outlines the tumor tissue, clearly differentiating between diseased tissue and healthy brain tissue, previously very difficult to do. Further, the tumor image is locked in during surgery, so if the

operating neurosurgeon moves, the image adjusts to keep neurosurgeons focusing precisely on the tumor tissue. This accuracy increases the safety and completeness of tumor removal by 50 to 75 percent. “We are now able to go directly, quickly to the tumor, with minimum disturbance to brain tissue,” Dr. Magid says.

He points to a recent case in which a patient had a lesion in an “elegant” area, meaning a region of the brain where specific functions, such as speech, are known to reside. “We scanned the patient with CT and MRI and loaded those images into the system,” he explains. “We were able to plan exactly where to approach the tumor and we were able to access the tumor with the most minimal disruption to brain function.” Prior to acquiring the new equipment, the surgeons would have had to leave some of the tumor in order to avoid potentially damaging the patient’s brain function. “Now we are able to get the last shards, so to speak, of the tumor,” he says.

Brain tumors often occur in seniors and are not uncommon in children. They often spread from malignancies elsewhere in the body, such as in the breast and lung. Because the tumors can now be removed more completely, those afflicted with them experience a much lower chance of recurrence, which may also spare them from follow-up radiotherapy treatment.

“The goal of every neurosurgeon is not only to do the very best he or she is capable, but to both ensure and assure patients that the surgery they are about to undergo will give them the very best outcome,” says Dr. Magid.

He credits Dominican Hospital with steadfastly adhering to the principle of providing the best possible equipment and care to its community, bringing technology and programs to this region that often are found only in larger metropolitan areas. When Dr. Magid joined Dominican in 1966, neurosurgery was unknown as a specialty in Santa Cruz. With the support from Dominican Hospital administrators, physicians and nurses, Dominican has become a world-class neurosurgery center over the years. “We came from nothing to a truly world-class center,” he says. Indeed, Dominican’s reputation has drawn neurosurgical patients from as far away as South America.

“The most satisfying aspect of my career has been for my partners and me to offer Santa Cruz the best available neurosurgical care,” says Dr. Magid.

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