

Breakthroughs help brain surgeons remove nearly all of a tumor, raise survival rates

April 18 2011, By Patricia Anstett

Donna Vinson suddenly felt she "couldn't think well." She was far off from choosing the right words, even pointing to a garbage can once as she asked a family member to pass the potatoes.

She and her doctor hoped stress from her father's death was causing the problem. But a scan found four menacing tumors deep in her brain.

Vinson, 53, of Sterling Heights, Mich., has glioblastoma, one of the most aggressive types of tumor. She wants to be in the group of one in 20 alive five years after diagnosis, so she can return to traveling, camping and doting on her five grandchildren.

New advances in brain imaging and tumor genetics from researchers in Detroit and elsewhere are helping more patients like Vinson survive longer, from just months to several years or more.

The imaging breakthroughs are giving surgeons better visual information before and during operations so they can remove nearly all of a tumor and increase [survival rates](#).

"Clinical studies show if we get 98 percent or more of the tumor out, that puts the patient into a very different prognostic class" where life expectancy and quality of life improve, said her cancer surgeon, Dr. Steven Kalkanis, co-director of the Hermelin Brain Tumor Center at Henry Ford Hospital in Detroit.

Less-toxic [chemotherapy drugs](#) that attack specific [genetic markers](#) in tumors also are coming.

Henry Ford researchers are leaders in the area of mapping brain tumor genomes through a national project. As one of the nation's 10 largest brain tumor centers, Henry Ford provides Vinson and other patients access to some of these latest technologies. The center sees 700 new patients a year and handles about 7,000 annual visits from people with the tumors.

"What we're hoping is that this will allow a patient ... to have double, even triple, the time they otherwise wouldn't have had," Kalkanis said of the advances in imaging. He called the technology "the missing link" for removing almost all of a brain tumor on the first try.

As little as a decade ago, Vinson's doctor might have opened her up only to end the surgery quickly after finding tumors too deep to reach safely without the benefit of more detailed scans.

But new technology, known as intraoperative magnetic resonance imaging, allows surgeons to remove more of a tumor by comparing pre-surgery pictures of a patient's brain with ones taken during an operation.

After a patient's head is opened, the brain changes shape as it shifts slightly. The new scans give doctors up-to-the-minute information about where tumors are located.

The system, referred to as iMRI, lets surgeons pause during surgery and inspect two screens next to the operating table that display the iMRI images.

Surgeons acknowledge that, in the past, too many brain tumor operations involved skill and some educated guesswork. But "(the new imaging

technology) helps bring more scientific guidance to a surgery. Before, it was me and my hands and whatever knowledge and experience I could bring to bear," said Dr. Jack Rock, a Henry Ford neurosurgeon.

Henry Ford also is testing new chemotherapy drugs that target molecular signals in [brain tumors](#). Henry Ford has contributed 150 brain tumors to the Cancer [Genome](#) Atlas, a federally funded effort to catalogue hundreds of cancer genes. Only one other center has provided more to the project.

"We have a fire hose of data coming on hundreds and hundreds of tumors," said Dr. Tom Mikkelsen, co-director of the Hermelin center.

"There's a whole new era of bioinformatics and systems biology about how genes talk to each other ... through interconnecting networks," he said.

Though more work needs to be done, the emerging brain tumor therapies should allow doctors to "legitimately offer patients less-toxic therapy and certainly more benefit" in longer survival, Mikkelsen said.

For now, some centers are taking a wait-and-see attitude as they compare one costly piece of equipment with another.

Henry Ford spent \$6 million on its operating suite and advanced imaging machine.

"We have to see how the technology plays out and whether it will have a substantial benefit," said Dr. Geoffrey Thomas, a neurosurgeon at St. Joseph Mercy Hospital just outside of Ann Arbor.

Dr. Andy Sloan, chairman of the brain tumor institute at University Hospital in Cleveland, said more study is needed to see which therapies

are most effective. He is testing a drug that illuminates tumor cells on a scan when a blue light is shined on them. Then he can go back with a laser and remove the remaining tumor traces.

Neurosurgeons say brain tumor patients most likely will continue to receive an array of treatments because no single therapy reliably works alone.

Kalkanis, who performed Vinson's operation March 31, said the iMRI technology helped him see, and then remove, nearly all of a large tumor in the area of her brain responsible for speech and communication.

There also were three clusters of smaller tumors in the same region that he removed.

She has begun [chemotherapy](#) and will get radiation to try to kill other scattered traces that couldn't be surgically removed without worsening her speech problems.

The Vinson family hopes she can get back to her normal life: traveling, being a grandmother and helping her husband, the Rev. Rick Vinson, with his work.

Almost two weeks after surgery, Donna Vinson was struggling to find her words but making improvements, her husband said.

"Now she can get sentences out," he said. "The Lord did His work, and now He just has to finish her up."

SOME FACTS ABOUT BRAIN TUMORS

-More than 64,500 people in the U.S. will be diagnosed this year with

primary brain tumors - ones that begin in the brain.

- Brain tumors can be malignant (cancerous), or benign (non-cancerous).

- Survival after diagnosis is improving: More than 31 percent of patients are alive five years later, up from 21 percent in the 1990s.

- After leukemia, brain tumors are the leading cause of cancer death in children and other patients younger than 20.

SOME OF THE SYMPTOMS

- Morning headaches or headaches that go away after vomiting

- Frequent nausea and vomiting

- Vision, hearing and speech problems

- Loss of balance and trouble walking

- Weakness on one side

- Unusual sleepiness or change in activity level

- Unusual changes in personality or behavior

- Seizures

LEARN MORE ONLINE

- National Cancer Institute: www.cancer.gov ; 800-4-CANCER (800-422-6237)

-American Brain Tumor Association: www.abta.org

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