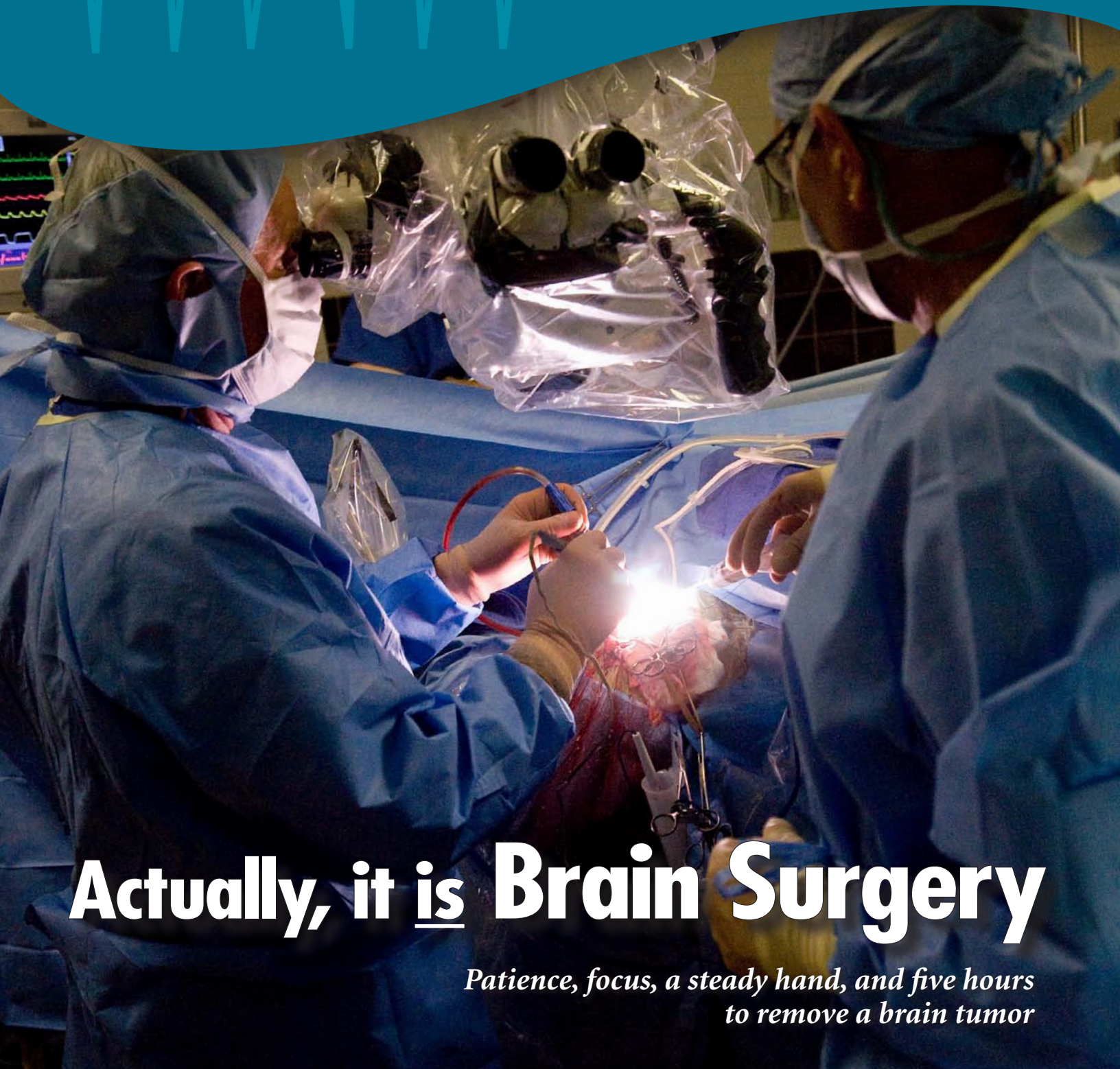


The Pulse

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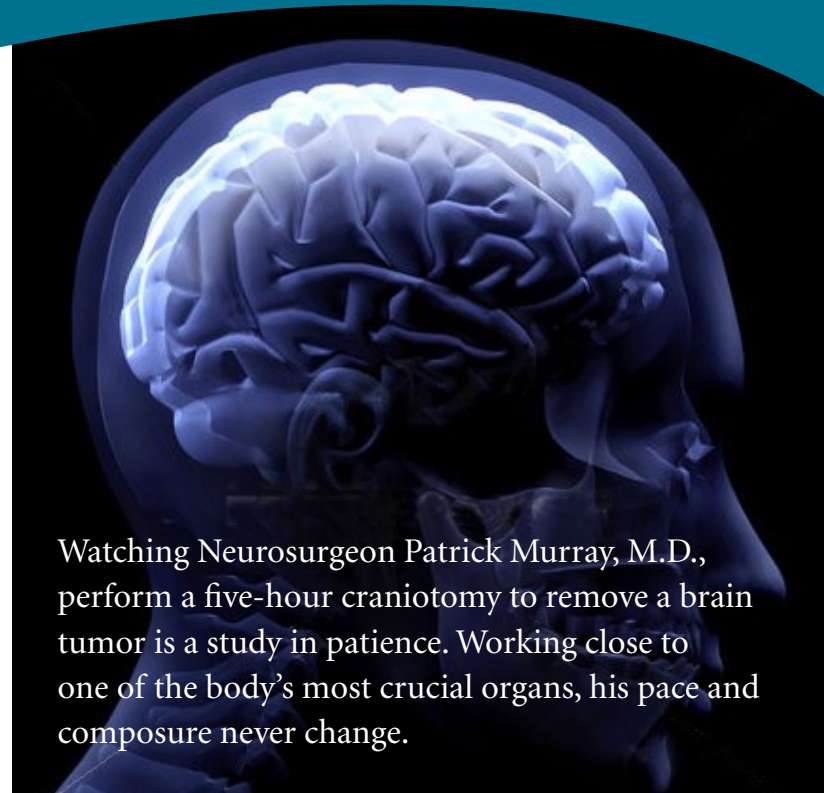
Actually, it is Brain Surgery

*Patience, focus, a steady hand, and five hours
to remove a brain tumor*



CAPE COD HEALTHCARE

An “Inside” Look at Brain Surgery



Watching Neurosurgeon Patrick Murray, M.D., perform a five-hour craniotomy to remove a brain tumor is a study in patience. Working close to one of the body’s most crucial organs, his pace and composure never change.



2 Pictured above: Neurosurgeon Patrick Murray, MD and surgical team perform a craniotomy on Nioma Karras.

“We unroof the tumor and then go in. We have to dissect and take off structures. The tumor will eventually collapse and we will take this whole tumor out through this small opening.”

Watching Neurosurgeon Patrick Murray, M.D., perform a five-hour craniotomy to remove a brain tumor is a study in patience. Working close to one of the body’s most crucial organs, his pace and composure never change.

On May 14, Nioma Karras put her faith in Dr. Murray and his neurosurgery team at Cape Cod Hospital. The 66-year-old Harwich woman had a large tumor in the portion of her brain that involves the vision. She had been complaining of headaches, nausea, blurred vision and difficulty reading for about four months.

X-rays revealed that the tumor had the characteristics of a benign meningioma, a tumor in the meninges, the membranes that cover the spinal cord and brain. The diagnosis could only be confirmed after a biopsy could be obtained and sent to pathology, Dr. Murray said.

“Our purpose is to remove as much (of the tumor) as we can with safety,” he explained in the CCH operating room the morning of the surgery.

In the room with him were Circulating Nurses Amy Murphy and Katie Roycroft, Surgical Technician Bert Proctor, Anesthesiologist Robert Mesirov, D.O., and medical student Laura Calabrese.

“We know what (the surgeons) want before they even ask. It makes for a nice day,” said Murphy.

For the surgery, Dr. Murray uses a computerized machine called a Navigator, which operates “like a GPS of the brain,” Dr. Murray said. It is a well-tested technique that enables the surgeon to know exactly where the tumor is in the patient’s head, where the surrounding healthy brain tissue is, and the safest place for the surgeon to make an incision.

“It adds a level of safety that would not be available otherwise,” Dr. Murray said.

An essential part of the navigation system is an MRI, which was taken of Mrs. Karras’ brain the morning of her surgery. Special markers were placed on her head prior to the scan. The scan was loaded onto the Navigator computer, allowing Dr. Murray to view a three-dimensional image of the patient’s brain throughout the surgery.

Just prior to the operation, Dr. Murray touched the center of each of the markers with a special probe. It transferred the signal to “register” on the computer the specific location being touched. The computer sits at the bottom of the operating table, allowing Dr. Murray to see exactly

where he is in the brain, just by waving the probe over the area.

Once Mrs. Karras had been prepared for surgery, Dr. Murray used the probe to see that the tumor was sitting about 2.2 centimeters deep. Right before he made the first incision, he acknowledged the complexity of surgery. “We expect any eventuality,” he said.

When he made his first incision into Mrs. Karras’ scalp, blood from the many surface vessels of that part of the body oozed immediately. Proctor was there with a coagulating instrument to stanch the bleeding initially. He then began assisting Dr. Murray as he placed white plastic “Rainey” clips around the flap of scalp being cut away. The clips would keep the flap of skin from bleeding during surgery.

The flap of skin was gently folded back onto the head, revealing the skull and its outer membrane.

When he was ready to open the skull, Dr. Murray used an electric surgical drill. Leaning onto it slightly, he made three small holes. Using a surgical saw, Dr. Murray then connected the holes, and the small circle of skull – about 3 inches in diameter – was lifted out. Proctor carefully wrapped it in gauze and placed it aside on the sterile table.

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The precision and economy of motion and time required for surgery makes it essential that surgeons have skilled teams around them. Dr. Murray praised the group that regularly joins him in the OR.

“This can’t be done unless people are rather sophisticated and have the experience,” he said.

Peering into the brain cavity, the salmon-colored brain was slightly swollen from the pressure of the tumor. The deep russet-colored tumor was in plain view.

The mass had originated in the falx cerebri, which is in the rear of the brain and close to the membrane that separates the right and left hemispheres. A meningioma has a recognizable structure, Dr. Murray said. About 96 percent of them are benign and they are twice as common in women, he said. There is no known cause, although exposure to large doses of radiation appears to be one risk factor, he added.

Before he began to remove the tumor, Dr. Murray took a small sample of it to send to pathology, where it was cryonically frozen, cut and examined. About 15 minutes later, pathology confirmed that the tumor was indeed a benign meningioma.

Dr. Murray then painstakingly began to make his way into the tumor using a high-speed device controlled by a foot pedal, called a Cavitron Ultrasonic Surgical Aspirator (CUSA.) The device

breaks up the tumor and aspirates the tissue at the same time.

“We unroof the tumor and then go inside. We have to remove the center of the tumor. The tumor will eventually collapse and we will take this whole tumor out through this small opening,” he said.

A large Leica surgical microscope machine was wheeled over the patient, allowing Dr. Murray to work through special lenses that magnify the surgical area. The image was displayed on an overhead monitor near the operating table.

For the next several hours, Dr. Murray worked methodically to implode and dissect the tumor without touching nearby areas of the brain. At certain intervals, he placed the computer probe over Mrs. Karras’ head to see on the computer screen how much of the tumor had been removed.

He was ever mindful of a large purple vessel winding its way near the tumor. “That vein drains a lot of the patient’s right hemisphere, so I must be very careful of it,” he said.

Sometimes he removed the CUSA and used scissors to cut away gristle-like pieces of tumor. He also used Bipolar Coagulation Forceps to burn away parts of the mass.

Later in the day, Circulating Nurse Nancy Andresen replaced Murphy and Roycroft, and Proctor was replaced by Surgical Technician Bill Fields. Still

later in the day, Circulating Nurse Margit McCullough filled in for Andresen.

His calm persistence still intact, Dr. Murray continued to make his way through the tumor. The Leica’s overhead screen showed the red tumor was dotted with black charred areas, and white fatty deposits elsewhere. Dr. Murray gently tugged the stubborn remaining pieces, cutting and removing them as he went.

Finally, almost five hours after the surgery began, Dr. Murray announced that the tumor was out. “Now we just have to tidy up a bit,” he remarked.

As he stepped away from the patient, he arched his back and flexed his neck and shoulders, stretching the muscles that had remained so still for so many hours. Asked if he gets fatigued during surgery, he said “not until now. One has to be focused when one is operating.”

Mrs. Karras is now back to normal with no headaches or any other neurological symptoms. She has normal vision and follow-up tests showed no remaining tumor, Dr. Murray said. She will be followed with annual CT and MRI scans for years to come, he said.

Mrs. Karras reported that she went back to work June 1 and that she is feeling “fantastic.” “(Dr. Murray) is an excellent surgeon,” she said.