

M.D. NEWS

Special Feature



Neurosurgeon Lucia Zamorano, M.D., Explores Treatment Options for Brain Tumor Surgery

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By Shelly Johnson

The recent news that Senator Ted Kennedy was diagnosed with a parietal lobe glioma, a malignant and inoperable brain tumor, not only sent tremors through the country over a family once again struck by tragedy, but will bring to the forefront, as we follow the Senator's fight, both education as to the scope of this diagnosis and what bold new treatment options are available, given such a seemingly poor prognosis. The seizure Senator Kennedy experienced prior to being admitted to the hospital opened up to him the possibility of a form of brain surgery that few people understand. The demand for immediate and bold remedies propelled him to Duke University to investigate treatment options. Over the upcoming months, we will follow with great interest and empathy the path the Senator will take in his battle against this invasive pathology. The irony that Kennedy, who has spent much of his political career — since 1971 — spearheading the first “war on cancer” and ensuing efforts to pump up the National Cancer Institute's research funding,

will not be lost on a nation that will follow this particular story.

Lucia Zamorano, M.D., a neurosurgeon on staff at the Detroit Medical Center and Royal Oak's William Beaumont Hospital, discusses the Kennedy brain tumor diagnosis and emphasizes the great strides having been made through computer-assisted surgery and intraoperative MRIs, which allow the surgeon to follow the changes taking place during a surgical procedure.

It was Dr. Zamorano, together with a team of radiation oncologists at the Detroit Medical Center, who introduced and implemented the first Gamma Knife neurosurgery in Michigan in 1996. A radical innovation moving away from traditional surgery, Gamma Knife radiosurgery has the advantage to the patient of requiring no incision or cut, general anesthesia is not required, there is no need for the head to be shaved and the patient is usually only hospitalized overnight. The tumor is destroyed by the emission of 201 sources of cobalt-60 radiation from a hood-like dome above the

Dr. Zamorano discusses treatment options from her office in Troy.



head. The surrounding brain tissue is left virtually unscathed as the individual beams are not strong enough to cause damage, but together, aimed at a single lesion, they have the capability to completely destroy the tumor or brain abnormality. As a noninvasive surgery, the usual risks from anesthesia, bleeding or infection are virtually removed. Dr. Zamorano was the first in the state to begin the radiosurgical treatment of brain lesions and has successfully treated over 1,000 patients using this technology.

In 2000, she and her team performed the first robotic brain surgery in the U.S. Particularly proud of having brought this innovative treatment to Detroit, she points out, "I think robotics is going to be the future of minimally invasive computer-assisted brain surgeries."

Her breadth of interest and clinical experience are reflected in her philosophy of optimism for her patients and their prognoses. She says, "One of my objectives is to give people hope. Many times, when a person finds out they have a brain tumor, they assume they are going to die." Reflecting on many patients she has treated where the prognosis seemed so poor, she is quick to point out that these patients are still alive and leading productive lives post surgery and during subsequent follow-up treatment. "Our applied research and techniques have resulted in many positive outcomes. There are usually numerous ways to handle a given situation," she says,

Dr. Zamorano consults with a patient.



Dr. Zamorano reviews MRI results.

PHOTOS BY JUEL ZAMPLAS

adding, "Often we will use several methods to treat one particular diagnosis, for instance. It's not hopeless. There is unlimited potential for positive outcomes."

As a young medical student in Chile, Dr. Zamorano envisioned a level of surgical precision that could be achieved through the use of computers and robotics. Her insight and devotion to her vocation have resulted in the realization of numerous technological breakthroughs. She reflects, "I always liked the idea of merging the two disciplines of medicine and computers. I've always been drawn to the nervous system and medicine, and I knew that mathematical precision and calculation could make it better. I think that image-based robotics is the future. The capabilities of developed robotics are endless."

Fluent in six languages, Dr. Zamorano is well versed in what's happening in the world of medicine. Following her graduation from Medical School in Santiago, Chile, and after completing her residency there, she was awarded a postgraduate clinical fellowship in the field of neurosurgery in Germany. "I became interested in the idea of computer-assisted surgery and I started seeing how we could use these techniques in surgery," she says. Since that time, she focused on minimally invasive brain and spine surgery, epilepsy, neurosurgical oncology, radio surgery and brachytherapy, utilizing the insertion of radioactive seeds to treat malignant brain tumors.

Throughout her professional life, she has sought to optimize computer-based imaging treatments. She sees computer-assisted surgery (CAS) is a method that has infinite possibilities. For instance, the intraoperative MRI gives surgeons the ability to see what's going on inside the brain *during* surgery. This has great advantages for the surgical team, as there are always changes from the planning stages of an operation that become necessary throughout the surgical process. She surmises, "The IMRI is just beginning to show us all the possibilities and capabilities at our disposal, which can bring invaluable help to patients."

Currently, the machinery capable of lending assistance to neuro-

surgeons requires quite a bit of manual effort to operate. This slows down the processing of data to the surgical team during operations. Dr. Zamorano foresees that with focused efforts, computerized and robotic equipment in the operating room will have a great impact on successful surgeries. Computers will enable accurate planning *before*, updates *during* and results *following* surgery. "I am striving for the maximum use of robotics and interactive image guidance to benefit my patients," she says.

Dr. Zamorano sees only positive repercussions of using robotics in surgery. She believes that a much-evolved robotic system is possible. One of the advantages in robotic surgeries is the extreme precision coupled with the fact that the robot does not get tired. They can work consistently from the beginning to the end of the day. Brain surgery can require endless hours of extreme concentration and focus. She is quick to point out, however, that robots are basically as good as they are programmed to be. CAS, although it has come a long way, still has a long way to go, in her opinion. Her belief is that with this technology, surgeries can be more technically accurate and could handle changes more aggressively. According to her, "Certainly, with a brain tumor, it is better for the pathology of the tumor that the mass be removed with ultimate precision. Another advantage is that CAS is minimally invasive. It's also possible to detect bleeding right away, and you can see exactly how much of the tumor has been removed. It's very complex, but if standardized, it would elevate the ease of surgery and success of recovery of patients."

Her life has been dedicated to advancing technology, and her years of research have resulted in countless implementations, rendering her international recognition. She has contributed significantly to the development of image-guided stereotactic surgery, interactive image guidance (navigation) systems, robotic microscopes, minimally invasive surgery, brachytherapy, radiosurgery, radiofrequency electrodes for functional mapping, robotics and laser applications. In 2005, Dr. Zamorano opened her own neurosurgical practice with offices in Birmingham, Detroit and Troy. Her focus is to be compassionate, efficient and effective, in conjunction with applying the most advanced methods of treatment available anywhere in the world.

Aside from her dedication to her profession, she shares other passions as well that allow her to reach out to her local community. She is deeply invested in the St. Vincent De Paul charity, where she is committed as a current Director. Her priorities to support downtown Detroit are reflected in her contributions to the theater and art.

Her positive attitude, sense of determination and healthy living come from sports and the outdoors, which she finds to be rejuvenating. "Inspiration, spiritual growth and meditation, I get through my religion and attending church," she says, "as well as reading the Bible. This gives me hope and faith and strength even in the most difficult moments. I always pray prior to any surgery to ask God to let me be an instrument able to help my patient. My motto is to keep always alive and strong with the elements in my life. I call it PMS — physical, mental and spiritual growth."

Dr. Zamorano is currently a voluntary professor of neurosurgery



Lucia Zamorano, M.D.

and radiation oncology at Wayne State University. According to her, "The future is wide open to new medical professionals. Robotics used in surgery is more than likely to become a new medical domain. I see a niche for professionals specifically trained in utilizing robotic equipment that assists surgeons in the operating room. We will need people to assist in the immediate interpretation of calculated computerized technology. If we can streamline computerized and human efforts in surgery, we will make great strides in helping patients."

As the country follows Senator Kennedy's progress in his battle against this most insidious cancer, we can feel fortunate to have unparalleled state-of-the-art technology and skilled physicians such as Dr. Zamorano in our midst. It is evident that her expertise in computer-assisted and minimally invasive neurosurgery is aligned with the most sophisticated methods and surgical techniques found anywhere. ■

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