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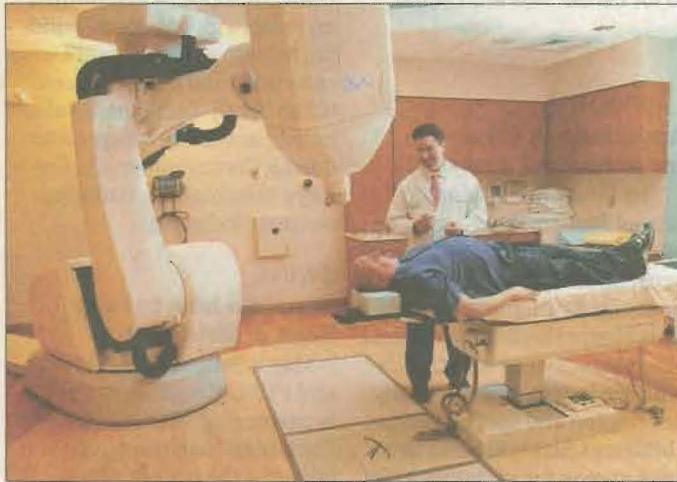
Surgical precision in Mercer

CyberKnife cuts new healing path

By Wendy Plump
SPECIAL TO THE TIMES

TRENTON — Mike Maita — Hamilton resident, former cop, husband, uncle and all-around good guy — walks into a treatment suite at Capital Health's Bellevue Avenue hospital surrounded by a team of doctors and technicians. This is familiar, almost comforting terrain for him, this 2,000 square feet of soft lighting, examining table and 14-inch-thick lead brick walls.

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CIE STROUD/FOR THE TIMES

Patient Mike Maita of Hamilton Square speaks with Dr. John Lipani about treatment for his cancer using cutting-edge technology known as the CyberKnife at Capital Health in Trenton.

Health

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Here Maita listened to Bob Marley for four hours over four separate afternoons two years ago. Here Maita had cancerous lesions on his brain and spine obliterated by the massive machine arching over the room, which looks something like a large kitchen appliance.

And here Maita returns to give testimony to the technology that likely saved his life, called CyberKnife. The doctors here — Maita's neurosurgeon Dr. John Lipani in particular — believe CyberKnife has the capacity to significantly alter the way inoperable cancers are treated.

In short, CyberKnife delivers higher doses of radiation with such pinpoint accuracy that cancerous tissue is destroyed while healthy tissue is relatively undisturbed, and the comfort of the patient receiving the treatment is almost unprecedented in the world of radiosurgery.

In addition, the treatments can be repeated day after day, a process known as fractionation, further targeting the cancerous tissue and blasting it repeatedly as it's made more and more vulnerable.

Capital Health is the only hospital system in Mercer County offering the treatment.

"I wasn't sure what to expect about CyberKnife," says Maita, 43, diagnosed with Stage Four cancer in September 2008. "I thought Arnold Schwarzenegger was going to break into the room, like the robot of the future coming after me. It's not like traditional chemotherapy. You hear enough about that and you can read enough about that. But CyberKnife,

Especially when I got it two

years ago, it was a very young technology.

"But I believe in advanced medicine. I wanted to give this a shot. And it was my only chance at the time. Now, I feel blessed," he says. "Every day is a gift to enjoy."

As Maita stands in the CyberKnife suite the technology driving the procedure momentarily takes a back seat. What is astonishing to him, and perhaps the hundreds of patients who have received CyberKnife treatments in the three years it's been available at Capital Health, is the "surgery" itself, a radical departure from traditional cancer surgeries.

Maita explains how he walked into the suite wearing his street clothes — no demeaning hospital gown split up the back.

There was a fitted mask that slipped onto his face as a means of steadying him on the treatment bed. But there was nothing affixed to his head holding him immobile, as in the somewhat older procedure employed under GammaKnife surgery.

There was no anesthesia because there was no need for it — Maita did not feel a thing. He brought his "Legend" CD and it played for the duration, Bob Marley's voice interrupted only occasionally by the sound of CyberKnife's robotic arm rotating.

And afterwards, Maita got up and went home. No pain. No incisions. No blood. No surgery-induced convalescence. No weird radioactive restrictions on his activities. He just went back to Hamilton and returned the next day for his next treatment.

Today, Maita is cleared of his lesions. His course of chemotherapy continues. He will

most likely never be in complete remission, he says. But CyberKnife enabled Lipani to treat lesions on his brain and spinal cord that would have been previously inoperable, meaning that Maita may not have long survived his initial diagnosis.

"Yes, that would probably have been it," says Maita.

The CyberKnife suite was built at Capital Health's Mercer campus in 2006 at a cost of \$5.5 million. The first patient was treated with CyberKnife in July 2007. Other regional hospitals that offer the technology are Cooper Hospital in Camden, Overlook Hospital in Somerset and AtlantiCare Hospital in Atlantic City.

The difference with the surgery at Capital Health is that it has Lipani, director of Neurosurgical Oncology and surgical director of CyberKnife.

Lipani, who did his residency at Thomas Jefferson University Hospital in Philadelphia, is the only fellowship-trained CyberKnife surgeon in the country (a distinction that he modestly points out could change at any minute).

Lipani was trained in its use at Stanford University Medical Center by the technology's inventor, Dr. John Adler, professor of neurosurgery. CyberKnife was cleared for full-body cancer treatment by the FDA in 2001.

Laconic and understated, Lipani is nevertheless clearly enthusiastic about the place CyberKnife could take at the front of a range of modalities now used to fight aggressive cancers.

"Traditional External Beam Radiation Therapy is a treatment that exposes both the healthy tissue and the unhealthy tissue in cancer

patients," Lipani explains. "But in order to preserve the healthy tissue, there's only so much radiation you can give to be effective and once you've reached that limitation you then begin to jeopardize the healthy tissue.

"So with the extreme precision and power that we have with the radiosurgery produced by the CyberKnife we're able to precisely locate the radiation onto the target, the lesion, while keeping it off the good, healthy tissue.

"What's more," Lipani continues, "we've been able to treat lesions that are otherwise inoperable. Lesions in Mike's case that were within a cranial nerve that would require sacrificing that nerve in order to treat it successfully. So not only are we able to go above and beyond the limitations of the traditional radiation therapy, but we're also able to effectively treat lesions that are not treatable with classic, open surgery."

The CyberKnife machine uses an advanced, lightweight linear accelerator that fires cross-beams of photo radiation at the tumor in a three-dimensional rotation. The beams themselves are innocuous until they converge on a point. Then their cumulative effect is generally lethal to the cancerous cells.

Computer technology — CAT-scans, MRIs, X-Rays and a very cool machine called a synchrotron camera that monitors breathing-induced movement — constantly generates images of the patient so that the cross-fire of beams sent toward the tumor can be directed to within 1 millimeter of precision.

Doses of radiation can be increased, decreased or cut off

entirely as the beams move in a 360-degree rotation around the cancerous lesions depending on whether those beams have to move through extra-sensitive tissue, like an organ or the cornea that would otherwise be compromised or destroyed by radiation.

Fractionation means this procedure can be done up to five consecutive days. Doctors can dole out the radiation again and again and again. Some cancerous cells, Lipani explains, may be weaker on day 2 of treatment than on day 1. With fractionation you can blast them repeatedly, increasing the likelihood that you will target them at their most vulnerable.

And because the technology is both precise and image-guided it can be performed in places where GammaKnife surgery could not go — the spinal cord, the lungs, the pancreas and prostate, the liver. It's a

whole-body therapy.

Like all innovative surgeries, CyberKnife is not without its controversies. Lipani attributes these mostly to its newness and to the occasional resistance to innovative surgeries by insurance companies and other hospitals themselves.

"I'm very excited about the technology and I just can't wait until everybody jumps on board," says Lipani. "You have a lot of naysayers. GammaKnife has been around forever. It's a somewhat different technology but it's the same concept, and all the sudden people say, no, I want 10 years of research on CyberKnife too. Well, all right, that means you have to wait 10 years.

"So what are you going to do with all those people in the meantime? So that's been a little bit of a struggle and an issue but we're working around that."