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Dr. Daniel E. Fass, director of the Institute for Image-Guided Radio Therapy, with the TomoTherapy machine in his Rye, N.Y., offices. Billed as “the biggest advancement in cancer radiation treatment in 50 years,” the computer-guided device targets and destroys cancer cells “with unprecedented precision and minimum side effects.”

Radiologist Daniel Fass has been zapping cancer cells for 27 years. Since his early days at Sloane Kettering, he has kept up with the latest weaponry in the fight against killer cells. The technology he said has been evolving steadily, but most recently, it has shot ahead with great new advances.

“Aiming was not as focused,” Dr. Fass, a Greenwich resident who is also director of the Institute for Image-Guided Radiotherapy (IIGRT) in Rye, N.Y., said of the old days. “It wasn’t bad,” he added, but sessions were long. Dosages of radiation hit their target, but still exposed a lot of normal, healthy tissue and organs to the lethal waves. For years, better targeting has been the goal.

Dr. Fass, who also works at Greenwich Hospital, recently introduced a machine of the latest technology in his private practice, using computers to hone the beam to near surgical precision. It’s a \$3-million machine called TomoDirect and it is state of the art in delivering multiple targeted beams of radiation to virtually any region of the body.

TomoDirect is a step up from TomoTherapy, a technology that emerged on the scene in 2003 and is now used in more than 250 hospitals and cancer centers around the world. Dr. Fass began offering the technology in 2007 and has treated more than 600 patients with it since then.

The new next generation machine was introduced at his practice in the past year. The Institute for Image-Guided Radiotherapy is one of only a handful of centers that uses the machine for cancer treatment and the first in the New York area, a IIGRT press release said.

"With the introduction of TomoDirect," Dr. Fass said, "we will have increased flexibility in choosing the best treatment technique for each individual patient, and an increase in overall treatment capacity."

A "donut hole" apparatus reminiscent of a CAT scan or MRI, the TomoDirect machine can deliver beams at 12 different angles of attack without having to move the patient.

Dr. Fass said this ability to more discretely aim the pulses limits the side effects of radiation.

"We don't have to worry as much about injury to the normal tissue," he said.

The other part of the breakthrough comes through the marriage of the zipper technology to computer assisted "mapping" abilities, linked to a database tracking the workflow from treatment planning, fine tuning, delivery, verification and record keeping to tweaking the plan for the next session.

A therapy session's "plan," or what specific points on a tumor are to be targeted, could take hours to plot out and then program in. Dr. Fass's new machines reduces the planning to 10 minutes or less. Patients may be in and out in less than half an hour, cutting the radiation time down to 15 minutes per treatment.

"Much better suited and safer for busy women," Dr. Fass said, calling TomoDirect "the next level in the evolution of computer-assisted radiation therapy."

It even helps that it's all under one roof. "No operator-controlled transfer of treatment delivery data is necessary," Dr. Fass said. "This minimizes the risk of data corruption or loss."

"TomoTherapy has changed the way we look at cancer care," he said. "Since adopting this technology we have been able to treat many patients we simply could not have treated before — those with complex disease, or those who may have received radiation previously. TomoDirect lets us expand the reach of this cutting-edge technology, designing an even more optimal plan for each individual patient, depending on their unique anatomy and clinical needs."

Dr. Fass said the technology holds special promise for breast cancer in particular.

"We expect that TomoDirect will significantly reduce delivery time for treatments, while effectively sparing the heart, lungs and healthy breast tissue," he said.

Sharyon Mitchell, 61, a nurse, was one of the first women in the Tri-State area to receive TomoDirect. Ms. Mitchell was diagnosed last fall when a breast surgeon discovered a two-centimeter cancerous tumor, which was removed by lumpectomy.

After five months of chemotherapy, Ms. Mitchell was referred to Dr. Fass. Ms. Mitchell's sister had died of breast cancer at the age of 39, so Ms. Mitchell was known to be at high risk. According to a company press release, the cancer was caught before any signs of it appeared in her lymph nodes and her prognosis now is excellent.

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