Vocal cord cancer meets CyberKnife

In a global first, a team of doctors at UT Southwestern seeks to preserve voice quality for cancer patients while shortening treatment time using the CyberKnife robotic radiosurgery tool.

Stephen Wiley of Terrell, Texas, was the first patient treated with CyberKnife for early-stage lesions of the glottic larynx.
Stephen Wiley, 59, is a central Texas trucker and rancher who in 15 years “never once took off work from being sick.” His job requires him to be talking on the radio constantly with his company’s dispatch center. Last fall, he noticed that his voice would be hoarse when he woke up in the early hours of the morning to get to work at 4:30 a.m. but would be better an hour or two later. But one day, instead of improving over the course of the day, it just got worse.

“By evening, my superiors couldn’t understand what I was saying on the radio,” recalls Mr. Wiley. “I had to go home.”

A string of referrals led him to UT Southwestern’s otolaryngology clinic, where he was diagnosed with an early-stage cancerous lesion of the right vocal cord. Coincidentally, two young UT Southwestern physicians had recently collaborated on a new approach to treat vocal cord cancer with the CyberKnife robotic radiosurgery tool. While the CyberKnife is FDA-approved to treat many different sites of cancer in the body, it has yet to be systematically explored in a clinical trial for vocal cord cancer.

Baran Sumer, M.D., a surgical oncologist, and Susie Chen, M.D., a radiation oncologist, both thought that CyberKnife might prove to be an effective alternative to other well-established therapies such as conventional radiation, carbon dioxide endoscopic laser surgery, and hemilaryngectomy. “Our goal is to maintain excellent disease control—we already have high cure rates for early-stage laryngeal cancer,” says Dr. Chen, “but it may be possible to improve patient convenience and quality of life in terms of how their voice recovers afterward.”

Instead of giving daily radiation over a period of six weeks, CyberKnife is able to deliver a precise, powerful dose in just a few: three weeks in the first study group, then two, then one. Currently, some patients opt for surgery to remove cancerous lesions rather than submit to a protracted course of radiation therapy, despite the risk that their voice quality after surgery may not be as good as with radiation.

Similar to the progression of surgery, which once removed the entire voice box but now treats only a single vocal cord, practitioners of radiation therapy have begun looking at reducing the field of radiation to target only the involved vocal cord, with one preliminary study from the Netherlands suggesting that advanced image guidance can significantly spare normal tissue from radiation.

Says Dr. Sumer, “We’re going to remove lesions in a very targeted way similar to surgery but using radiation.” The difficulty of targeting an area with so much inherent movement was solved with the placement of gold fiducials. Dr. Sumer helped plan the area to be removed, and Dr. Chen, a member of the Radiation Oncology head and neck team, took charge of the patient’s radiation treatment.

Mr. Wiley says he chose to be a part of the first study group because the three-week course of treatment would help him get back to work faster. “But it wasn’t just that,” he adds. “If I can do something that will help other people in the future, I want to do it.”

When he’s finished with CyberKnife, he says, he looks forward to rejoining his family in rodeo competitions and horse training.

UT Southwestern physicians, too, are looking forward to the initial results of the CyberKnife trial, which recently completed its first phase. The Department of Radiation Oncology has continuously led studies in the developing field of hypofractionated, image-guided radiotherapy, which uses complex planning and multiple delivery angles to deliver ablative doses of radiation in just a few treatment sessions. This trial is the first to systematically explore CyberKnife for vocal cord cancer in the clinical setting. “In particular, the dose to the uninvolved vocal cord could be limited to less than 30 Gy with this setup, which has the potential to improve functional voice outcomes,” says Dr. Chen. “Through single cord targeting we hope to realize the same efficiency that has already been realized in the surgical field, providing our patients with more options and better outcomes.”

“It may be possible to improve patient convenience and quality of life in terms of how their voice recovers.”
New faculty brings future of GPU processing to Rad Onc

Steve Jiang, Ph.D., has joined the Department of Radiation Oncology as Professor, Vice Chairman, and Chief of the 61-person Division of Medical Physics and Engineering.

Dr. Jiang and his team of researchers, which has regrouped at UT Southwestern, have earned renown in recent years as pioneers in the application of graphic processing unit (GPUs) processing to the field of radiation medicine.

A fellow of the American Association of Physicists in Medicine, Dr. Jiang earned his doctorate in radiation physics at the Medical College of Ohio in Toledo and completed a postdoctoral fellowship at the Stanford University School of Medicine. As part of his distinguished academic career, he most recently led the development of the Center for Advanced Radiotherapy Technologies (CART) at the University of Texas Southwestern Medical Center, both in Seattle. His career in academic medicine was honed while serving on the faculty at M.D. Anderson Cancer Center in Houston.

While Dr. Jiang will continue his GPU research here, he stresses that his main role will be as a facilitator to provide technical support, ideas, and grant assistance to other members of the physics team. He also has plans to embed the physics team in the clinic, so that physicists adapt their research closely to real-life problems and solutions. "We have to work together as a team with the physicians," he says.

Schwartz to lead head and neck team

David Schwartz, M.D., has joined the clinical faculty in Radiation Oncology and will lead the department's focused head and neck team.

A California native, Dr. Schwartz graduated from Stanford University and earned his medical degree at the David Geffen School of Medicine at UCLA. He completed his residency in radiation oncology at the University of Washington and the Fred Hutchinson Cancer Research Center, both in Seattle. His career in academic medicine was honed while serving on the faculty at M.D. Anderson Cancer Center in Houston.

Dr. Schwartz has participated as lead investigator for a wide number of local and national clinical trials, has received funding from NIH, VA, industry, and foundation grants, and has published his research in more than 50 peer-reviewed articles in scientific journals. He also has served as a journal reviewer and editor and has lectured widely on topics related to cancer management and adaptive radiotherapy. His current interests include adapting mobile technology to improve the patient experience.

Dr. Schwartz says he gravitated toward the treatment of head and neck cancers during his first professional position at the VA Hospital in Seattle.

"The majority of cancers we treated had to do with cigarette smoking," recalls Dr. Schwartz. "What I quickly figured out is that head and neck cancer is unique in its impact on human functions that we mostly take completely for granted."

He continues, "Think of all the things that you do with your face, mouth, and throat—the things we need to do to connect with others and to be human. Eating with friends, talking with family, hearing the world around you, the appearance of your face—these are things that define who you are, your place in the world, and your relationships with others. Your entire self-worth can be stripped away if you lose these elemental functions, either from the cancer itself or, tragically, by the treatments we use to cure the cancer.

"The reason I chose to be in academic medicine is to have the opportunity to find ways to lessen the impact on these functions so that patients can continue being themselves and have a good quality of life once their treatment is complete. My goal is to discover better ways to cure cancer and to guide patients toward a full recovery."
Clinical Trials

**BRAIN**

**RTG0-0013** Phase III trial of concurrent RAD001 (everolimus) with hypofractionated radiotherapy for patients with glioblastoma.

**RTG0-0012** Phase III trial of utah0247 and stereotactic body radiation therapy (SBRT) in patients with temozolomide resistant glioblastoma.

**RTG0-0011** A Phase II/III study of image-guided radiosurgery for large cerebral arteriovenous malformations.

**RTG0-0010** A randomized, double-blind, phase II, dose-ranging study to evaluate the safety and efficacy of vilaprisan and whole brain radiation therapy versus placebo and whole brain radiation therapy in subjects with brain metastases from non-small cell lung cancer.

**RTG0-0009** A Phase II trial of high-dose rate stereotactic body radiation therapy (SABR) for patients with liver metastatic clear cell renal cell cancer (mRCC) vs. placebo-controlled study of lapatinib (Tykerb ®) for non-HV locally advanced head and neck cancer with concurrent chemoradiation.

**RTG0-0008** A phase II study of stereotactic body radiation therapy and pelvic radiation therapy with or without temozolomide for symptomatic or progressive high-grade gliomas.

**RTG0-0007** A randomized, double-blind, phase II trial of high-dose rate stereotactic body radiation therapy (SABR) for patients with metastatic breast cancer.

**RTG0-0006** Randomized, double-blind, vehicle-controlled pilot study of the efficacy and safety of Vyxeos ™ in the treatment of acute skin changes in patients undergoing external beam radiotherapy for tumors of the breast.

**RTG0-0005** A phase II study of CyberKnife® partial brain irradiation (PBI) for early-stage breast cancer.

**RTG0-0004** A phase II trial of accelerated whole brain irradiation with hypofractionated plus concurrent boost versus standard whole brain irradiation plus sequential boost for early-stage breast cancer.

**GASTROINTESTINAL**

**RTG0-0003** Phase II trial of high-dose 5-Flurouracil and cerivastatin-actylate body radiation (SABR) for patients with metastatic clear cell renal cell cancer (mRCC).

**RTG0-0002** Phase II trial of high-dose T and stereotactic ablative body radiation (SABR) for patients with metastatic castrate-resistant prostate cancer (mCPRC).

**RTG0-0001** A phase II randomized, double-blind, placebo-controlled study of lapatinib (Tykerb ®) for non-HV locally advanced head and neck cancer with concurrent chemoradiation.

**RTG0-0000** A Phase II study of postoperative radiation therapy (IMRT) + cetuximab for locally advanced rectal cancer and pelvic lymphadenectomy.

**HEAD AND NECK**

**GENTOURINARY**

**RTG0-0014** A phase II study of stereotactic radiotherapy using fiducial markers to deliver high dose for high-risk squamous cell carcinoma of the head and neck.

Trials focus: Ixempra + SBRT

Triple negative breast cancer affects about 15 percent of people in breast cancer and can be difficult to treat. It is not responsive to hormone and HER-2-directed therapies and can develop resistance to standard chemotherapy.

Ixabepilone (trade name Ixempra) was approved by the FDA in 2007 to treat breast cancer and has been found to maintain activity in breast cancer with multi-drug resistance. For patients with triple negative breast cancer whose cancer has spread after chemotherapy, ixabepilone has been successfully tested in clinical trials.

For more information, please contact Clinical Research Management, Jean Wu at 214-633-1753 or jean.wu@utsouthwestern.edu.

Recent faculty publications


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Physicians who would like to make a referral may call the Department's main clinic number at 214-645-8525 or UT Southwestern's physician referral line at 214-645-8300 (toll-free 866-645-5455) for adult patients, or 877-445-1234 for pediatric patients.

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