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First Skin Cancer Patients Treated with Electronic Brachytherapy Technology

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A new electronic brachytherapy system delivers a high therapeutic dose to a cancerous tumor while sparing neighboring healthy tissue by using a miniaturized X-ray source instead of radioactive isotopes.

Earlier in July 2009, the University of Wisconsin (UW) Cancer Center Riverview became the first medical facility in the world to treat patients with a breakthrough treatment of skin cancer. Located within Riverview Hospital, Wisconsin Rapids, the UW Cancer Center Riverview is the first to treat skin cancer patients with the U.S. Food and Drug Administration- (FDA)-cleared Axxent electronic brachytherapy system, developed by Xoft, Inc. (Sunnyvale, CA, USA).

The Riverview Center initiated treatments on three patients with nonmelanoma skin cancers under the direction of James S. Welsh, M.S., M.D., the center's radiation oncologist and a clinical professor in the department of human oncology and medical physics at the University of Wisconsin, Madison. Dr. Welsh collaborated with Yi Rong, Ph.D., chief medical physicist at UW Cancer Center Riverview, on the planning and delivery of the treatments. Dr. Rong discussed this process at the 51st annual meeting of the American Association of Physicists in Medicine on July 26-30, 2009, in Anaheim, CA, USA.

Skin cancer is the most common cancer in the United States with more than one million cases diagnosed annually and results in more than 10,000 deaths yearly, according to the U.S. National Cancer Institute (Bethesda, MD, USA). However, if diagnosed and treated early, most cases of skin cancer can be cured. While melanoma is the most serious form of skin cancers, it accounts for less than 10% of all cases. Nonmelanoma skin cancers, such as basal cell carcinoma and squamous cell carcinoma, represent the majority of all new cases.

"We are dedicated to bringing the most complete and innovative cancer care to patients in central Wisconsin, which is why we are so excited to introduce electronic brachytherapy as a treatment for nonmelanoma skin cancer," said Dr. Welsh. "By using the Xoft skin applicator, which just became available in June [2009], we shorten the course of treatment and precisely conform the radiation dose to the cancerous cells to preserve healthy surrounding tissue. This is safer both for patients and for radiation therapy staff who are able to remain in the room to monitor and reassure patients during the treatments."

Treatment options for nonmelanoma skin cancer include several types of surgery, topical treatments, and radiation therapy. The location and extent of the cancer influences the selection of the best treatment options for each patient. Whether in combination with surgery or as a standalone treatment, electronic brachytherapy enables clinicians to administer radiation therapy without the use of a radioactive isotope and in clinical settings where a shielded vault is not needed.

Available for treatment of early stage breast cancer, endometrial cancer, and skin cancer, the Axxent eBx system is also FDA cleared for use in the treatment of surface cancers or conditions where radiation therapy is indicated, including intraoperative radiation therapy (IORT). As a platform technology, the Axxent system is designed to deliver nonradioactive therapy directly to cancer sites with minimal radiation exposure to surrounding healthy tissue. Utilizing a proprietary miniaturized X-ray source and robotic controller, treatment can be performed in minimally shielded therapeutic settings allowing the radiation oncologist and other medical personnel to be present during treatment delivery and minimizing patient anxiety.

The University of Wisconsin Cancer Center Riverview is affiliated with the University of Wisconsin Carbone Cancer Center (Madison, WI, USA). In November 2006 the Riverview center became the first in central Wisconsin to treat patients with helical tomotherapy, the most sophisticated and effective image-guided and intensity-modulated radiation therapy that exists today.

Xoft develops electronic brachytherapy (eBx) systems based upon miniaturized X-ray tube technology for the practice of radiation oncology in virtually any clinical setting, eliminating the need for heavily shielded environments. Xoft provides a point of care model that is patient centric and accessible to a broader spectrum of patients and their physicians. The Axxent treatment platform provides a therapeutic dose of radiation directly to the region at risk with minimal radiation exposure to surrounding healthy tissue and without the complex handling, resource logistics, and costs associated with using radioactive isotopes. Xoft aligns with the Nuclear Regulatory Commission's (NRC; Washington DC, USA) directive to seek alternatives for radioactive medical isotopes. Commercially available for treatment of early stage breast cancer, skin cancer, and endometrial and rectal indications, the Axxent electronic brachytherapy system is also cleared for use in the treatment of other cancers or conditions where radiation therapy is indicated.