Northwestern Memorial Hospital's Commitment to Sarcoma Research

Sarcomas: An Overview

A type of cancerous tumor, a sarcoma is characterized by its development in tissues that connect, support, or surround other structures and organs of the body. When this type of malignancy originates in muscle, fat, fibrous tissue, blood vessels, or other supporting tissues of the body, it is known as a soft tissue sarcoma. Another form of sarcoma begins in the cells of bone.

Soft tissue sarcomas are quite rare, as evidenced by the fact that, in 2006, they represented less than one percent of all newly diagnosed cancer cases in the United States. And yet, soft tissue sarcomas are considerably more common in children than in adults, accounting for approximately seven percent of all childhood cancers.

In determining the best course of treatment for a particular sarcoma, physicians must consider:

- **The size of the tumor**
- **The grade of the tumor**, which is determined by the degree of abnormality of the tumor's cells when viewed under a microscope, as well as by how quickly the tumor is expected to grow and spread
- **Whether or not the cancer already has spread** to the lymph nodes or to other parts of the body.

Typically, surgery is performed to remove the tumor. For some soft tissue sarcomas, surgical removal of the tumor might be the only form of treatment required. In many cases, however, radiation therapy and/or chemotherapy are administered either before or after a person undergoes surgery.

Northwestern's Comprehensive Sarcoma Program

The dedication of exceptional physicians, coupled with the support of philanthropic partners such as the Christopher Steele Foundation, has laid the groundwork for a thriving, comprehensive sarcoma program at Northwestern. As the program continues to serve an ever-increasing number of patients, its physicians remain committed to providing the finest clinical care and to advancing innovative research.

Representing a variety of medical specialties, the following physicians provide leadership within Northwestern's sarcoma program:

- **Mark Agulnik, MD**: Hematology/Oncology
- **Jeffrey Wayne, MD**: Surgical Oncology
- **Alan Yasko, MD**: Orthopaedic Oncology
- **William Laskin, MD, as well as other colleagues**: Pathology

- **Numerous colleagues within Northwestern Memorial Hospital's Department of Radiology**.

Significant Achievements

Members of Northwestern's sarcoma program welcome opportunities to participate in Phase I and II clinical trials of novel chemotherapeutics and new targeted agents. Through targeted therapy, drugs or other substances are administered to a patient, with the goal of finding and attacking specific cancer cells while preserving normal cells.

In the past year, two important clinical trials have been brought to successful completion. As the leading site for one of these two studies, Northwestern joined with the Mayo Clinic, M.D. Anderson Cancer Center, and Fox-Chase Cancer Center in a Phase II clinical trial examining bevacizumab (brand name: Avastin) as a means of treating angiosarcoma. This type of tumor begins in the cells that line the blood vessels or the lymph vessels, is highly aggressive, and tends to recur locally and spread widely. As potential therapeutic agents, monoclonal antibodies (mAbs), such as bevacizumab, can block tumor growth in various ways. Some mAbs stop tumor cells from growing and spreading, while others hone in on tumor cells and help destroy them. Still other mAbs may carry tumor-killing substances to cancerous lesions. Research also has suggested that bevacizumab may stop the growth of tumor cells by blocking blood flow to a tumor.

In conducting this multicenter clinical trial, Dr. Agulnik and his colleagues sought to determine the effect of bevacizumab on angiosarcoma patients' median survival rate, with no observable tumor progression. The researchers also evaluated the nature and duration of study participants' treatment response, any changes in tumor density resulting from the use of bevacizumab, and the overall safety and effectiveness of this medication for angiosarcoma patients. The study's findings are encouraging, and, in May of 2009, at the annual meeting of the American Society of Clinical Oncology, Dr. Agulnik presented data from this clinical trial to his colleagues.

Future Plans and Goals

A number of targeted agents are of interest to Northwestern's physician-researchers who specialize in the treatment of sarcomas. Future research likely will explore the following therapies in greater depth:

- **m-TOR inhibitors**: M-TOR is a protein that regulates cell growth and proliferation. If m-TOR is not properly functioning, cells can multiply uncontrollably, resulting in cancer. M-TOR inhibitors are therapeutic agents designed to slow down or stop this continued, harmful cell proliferation.

- **c-kit inhibitors**: C-kit receptors bind to stem cell factor, a type of protein that causes certain types of cells to grow. Altered forms of the c-kit gene may allow this cell growth to occur too rapidly, thus leading to some types of cancer. C-kit inhibitors are designed to slow down or stop the growth of cancerous cells associated with c-kit mutations.

- **Anti-VEGF therapies**: Vascular endothelial growth factor (VEGF) is a protein that stimulates the formation of new blood vessels. Because certain cancerous tumors are characterized by an overexpression of VEGF, anti-VEGF therapies therapies have been designed to address this problem.

As Northwestern's sarcoma program continues to expand and to deliver care to an ever greater numbers of patients, philanthropic support will play a pivotal role in the achievement of future milestones. For example, Dr. Agulnik notes that philanthropic funds will enable the creation of a database that will store longitudinal patient data. This information will allow physicians to follow patients' progress over time and to evaluate relationships between treatment decisions and patient outcomes.