Minimally Invasive Procedure for Oncology

Siemens introduces a product portfolio for new treatment methods at RSNA 2009

Chicago, Ill., Nov. 29, 2009 – At the 95th Scientific Assembly and Annual Meeting of the Radiological Society of North America (RSNA) from November 29 to December 3 at McCormick Place in Chicago, Siemens Healthcare will introduce its comprehensive portfolio for imaging in interventional oncology at booth #825, East Building/Lakeside Center, Hall D. Using these minimally invasive procedures for cancer therapy, the interventional radiologist navigates catheters or needles in the millimeter range. To this end, systems and applications are required that supply high image quality for the detection of details in soft tissue. Siemens provides high-end imaging systems and advanced applications for this purpose, which support the physician throughout the entire workflow, from tumor evaluation and procedure planning to therapy and follow-up.

The World Health Organization (WHO) predicts that cancer will become the world's most frequent cause of death in 2010, replacing cardiovascular diseases as the most common cause of death. More than 10.6 million people are diagnosed with cancer each year. Of these, 1.3 million are afflicted with lung cancer, 1.2 million with breast cancer, and up to 1 million patients with colorectal tumors. The number of people suffering from cancer is expected to increase by another 50 percent by 2020 (source: WHO 2003).

New, minimally invasive procedures, suitable for the therapy of primary tumors and for metastases, have established themselves in recent years. The new procedures enable targeted tumor treatment via a catheter or a needle, while angiography systems display the position of the device in the patient's body to the physician. Since therapy takes place locally, impact to the patient is minimalized and quality of life improved as he or she can be released from hospital soon afterward. These local procedures are advisable, especially for patients who are advanced in years, have a poor general health condition, or are afflicted with accompanying diseases, which do not permit a major operation or aggressive chemotherapy.

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“At RSNA 2009, Siemens is pleased to demonstrate applications and enhancements to the Artis zee platform designed to support the phenomenal growth in interventional oncology procedures,” said Claus Grill, vice president, Cardiac, Interventional, Neuro and X-ray Systems, Siemens Healthcare. “With tools for improved planning, visualization, and needle guidance, as well as enhanced patient access as delivered by the Artis zeego, physicians can more effectively treat tumors in less invasive ways for patients.”

syngo® DynaCT enables the display of soft tissue, including tumors and of the complex structures of the blood vessels supplying them during therapy. Thanks to short reconstruction times, abdominal images can be made available to the treating physician within 22 seconds. An investigation recently conducted at Charité Hospital in Berlin showed that syngo DynaCT leads to repositioning of the catheter, and thus increases the reliability of the tumor treatment, in 50 percent of all chemoembolizations[1].

Large-volume *syngo* DynaCT offers the interventional radiologist virtually unlimited freedom of movement in combination with the robotic-based angiography system Artis zeego®. The system’s flat detector rotates twice 220 degrees around the patient with such precision that cross-sectional images covering 47 centimeters can be acquired. These images enable more comprehensive anatomic coverage than soft tissue images acquired with any other angiography system. The liver and lungs can be covered fully.

syngo Embolization Guidance enables advanced planning of the embolization of tumor-feeding blood vessels. Using this application, the vessel supplying the tumor can be marked, and the centerline of the vessel is automatically calculated, which is then superimposed on the live fluoroscopic image, thus simplifying catheter guidance during tumor embolization considerably.

With *syngo* InSpace 3D/3D Fusion, previously acquired CT, MR or PET/CT images can be fused with high-contrast 3D angiography images or with syngo DynaCT datasets in order to present all relevant diagnostic and interventional data at a glance. The fused dataset can be overlayed on live fluoroscopic images in the interventional lab and provides additional information on the tumor during the procedure (e.g., regarding its activity).

If a tumor is to be treated with an ablative procedure, it is especially important to position the needles that release the energy to the tumor precisely. *syngo* iGuide helps to plan and position the

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needle. The iGuide Cappa navigation system supports the placement of radiofrequency and biopsy needles via electromagnetic navigation without requiring any radiation.

Interventional procedures in oncology

Interventional oncological procedures can be divided into two categories: transcatheter therapies and ablative therapies.

Transcatheter therapies – During chemoembolization, small particles are injected in the vessels supplying the tumor via a catheter, until the vessel is occluded and the blood supply to the tumor has been stopped. Since the required nutrients and oxygen then remain absent, the tumor cells located in this area die. In addition, a chemotherapeutic substance is injected through the catheter and thus, placed directly on the tumor (local chemotherapy). This chemotherapeutic substance also causes the cancer cells to die off.

During selective internal radiotherapy, tiny microspheres with a diameter of only 20 to 40 micrometers (thousandths of a millimeter) containing a radiation-emitting isotope, are injected in the blood vessels supplying the tumor with the help of a catheter. Embolization and radiation cause the cancer cells to die off.

Ablative therapies – Radiofrequency ablation (RFA) is currently the most commonly used thermoablative procedure. Using an electric generator, a high-frequency alternating current is generated outside of the body. This current is guided through the skin and directly to the center of the tumor via a cable and a long needle (probe) by means of optical control. There the tissue is heated up within a radius of several centimeters around the tip of the probe. Inside the tumor, temperatures of 122 to 194 degrees Fahrenheit are reached and the malignant tissue is positively “boiled away,” thus, permanently destroying the tumor.

[1] Results of a study published in European Radiology March 2009 by Dr. Meyer, University of Berlin, Charite, Germany and Prof. Dr. Wacker; John Hopkins Hospital, Baltimore.

The **Siemens Healthcare Sector** is one of the world's largest suppliers to the healthcare industry and a trendsetter in medical imaging, laboratory diagnostics, medical information technology and hearing aids. Siemens is the only company to offer customers products and solutions for the entire range of patient care from a single source – from prevention and early detection to diagnosis, and on to treatment and aftercare. By optimizing clinical workflows for the most common diseases, Siemens also makes healthcare faster, better and more cost-effective. Siemens Healthcare employs some 49,000 employees worldwide and operates in over 130 countries. In fiscal year 2008 (to September 30), the Sector posted revenue of 11.2 billion euros and profit of 1.2 billion euros. For further information please visit: www.siemens.com/healthcare.

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