

Hepatic function testing can assist in treatment planning for liver cancer patients

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Monitoring the hepatic function of unresectable liver cancer patients, measured by ^{99m}Tc -labeled iminodiacetic acid (HIDA) via single-photon emission computed tomography (SPECT) prior to and during radiation therapy, provides vital information that could guide more customized treatment plans and reduce risks of liver injury, according to research being presented at the 2013 Cancer Imaging and Radiation Therapy Symposium. This Symposium is sponsored by the American Society for Radiation Oncology (ASTRO) and the Radiological Society of North American (RSNA).

This study included 14 patients who had unresectable intrahepatic cancers and were treated with 3-D conformal radiation therapy (3-D CRT), [intensity modulated radiation therapy](#) (IMRT) or stereotactic [body radiation](#) therapy (SBRT) at a median dose of 52 Gy. Patients underwent HIDA SPECT scanning prior to radiation therapy, after delivery of 50 to 60 percent of the planned doses and one month after completion of radiation therapy. In addition, indocyanine green tests, a measure of overall liver function, were performed +/- one day of each SPECT scan. The 27 dynamic HIDA SPECT volumes were acquired over a 60-minute period after the administration of 10 mCi ^{99m}Tc -labeled HIDA on a SPECT/CT scanner.

Measuring the regional liver function prior to radiation therapy allows assessment of the precondition of the patient's liver function. Evaluating the change of the regional liver function during the mid-course of radiation therapy indicates the response of the individual patient's liver

to radiation doses. Combining the planned radiation doses with the regional liver function assessment and re-assessment, investigators developed a model to predict the regional liver function post-radiation therapy. This information is vital to providing patients with the highest radiation doses for better tumor control, while minimizing the risk for each patient.

"Through this assessment method, patients could potentially receive more treatment doses tailored to meet their needs, based on their [liver function](#)," said Hesheng Wang, PhD, the lead study author and a postdoctoral fellow in [radiation oncology](#) at the University of Michigan in Ann Arbor, Mich. "The physiological adaptation of radiation therapy based upon individual response assessment is a valuable new paradigm worth additional testing."

More information: The abstract, "Hepatic Function Model Based upon HIDA SPECT and Dose for Physiological Adaptive RT," will be presented in detail during a scientific session at 10:30 a.m. Eastern time on Friday, February 8, 2013.

Provided by American Society for Radiation Oncology

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