

# New 'microbead' radiotherapy more effective with molecular imaging

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Research unveiled at SNM's 57th Annual Meeting may change the way that a novel form of radiotherapy is set up and tested prior to treatment. This technique, known as radiomicrosphere therapy, involves the injection of tiny highly radioactive beads that "nestle up" with cancerous tumors and destroy them with precision. However, technologists and physicians must work together to carefully plan each patient's treatment using molecular imaging to ensure that the beads do not wander off into other areas of the body.

"Radiomicrosphere therapy guided by molecular imaging is an emerging area of radiotherapy and has the potential to target treatments for [cancer](#) patients," said Ron Young, C.N.M.T., principal researcher and clinical manager of nuclear medicine at the Cleveland Clinic, Cleveland, Ohio. "This technique allows us to provide the most effective and individualized therapy with minimal complications for the patient."

Radiomicrosphere therapy can lead to unwanted damage to healthy tissues. Young emphasizes that those providing care must perform an imaging scan of patients to predict where these particles are going to travel and potentially destroy normal tissue. A form of [molecular imaging](#) called SPECT/CT, which combines single photon emission computed tomography and X-ray computed tomography, may be the best tool for determining the likely path of these cancer-killing microbeads. With this form of [radiotherapy](#), also called radioembolization, tiny beads are impregnated with a [radioisotope](#) and injected into the liver with a [catheter](#) inserted through the groin. Prior to

therapy, technologists and nuclear medicine physicians simulate therapy by injecting patients with the imaging agent Tc99m-MAA, which emulates the migration pattern the spheres will take. Molecular and X-ray imaging with SPECT/CT technology provide the essential information interventional radiologists need to then block blood vessels surrounding the targeted organ with small metal coils, effectively isolating the microbeads during therapy.

In this study, 99 patients underwent conventional planar imaging with gamma camera technology followed by imaging with SPECT/CT prior to therapy. Only nine patients out of the 99 showed potential for "shunting" or bleeding of the radioactive particles into other areas of the body, leading to the destruction of healthy tissues. The use of SPECT/CT alone indicated that 23 patients, more than double that of more conventional imaging, showed potential for complications. Another patient's hepatic vein, the main blood vessel into the liver, was shown to be obstructed by the tumor, which informed the treating physician that therapy would need to be altered due to this obstruction. In this case, SPECT/CT was able to uncover a previously unknown complication that changed the course of treatment for the patient. According to the study, SPECT/CT makes radiomicrosphere therapy a more powerful and safer tool for cancer therapy.

Provided by Society of Nuclear Medicine

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